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國際學碩士學位論文

**The Impact of the
Emergence of China on
EU-7's FDI to Central and Eastern European
Countries**

중국의 부상이 중동유럽으로 향하는 EU-7의

해외직접투자에 끼치는 영향

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The Impact of the
Emergence of China on
EU-7's FDI to Central and Eastern European Countries

A Thesis Presented By

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to

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ABSTRACT

The Impact of the Emergence of China on Central and Eastern European Countries' Inward FDI

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Many countries have been paying attention to rapidly emerging China. China has been one of the most popular destinations for investment due to its low cost of labor and potential of access to further East Asian market. In addition to its fast growing economy, China's accession to WTO in 2001 helped to lure more foreign investors.

Most developing countries fear that their inflow of FDI could be diverted away into China. Particularly, the Western EU member states who have long been one of the largest investors of Central and Eastern European countries have recently declared to strengthen their economic relationship with China by increasing their outflow of FDI.

This paper aims to explore whether there is a presence of China effect in EU-7 (Austria, Belgium, France, Germany, Luxembourg, Netherlands, Italy)'s outflow to

Central and Eastern European Countries (Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia). In order to test the FDI diversion, two gravity models will be used: 1) to test the effect of China's increasing FDI inflows on CEECs with dated panel data of inflow of FDI from Western EU-7 countries; 2) to find out whether China's accession to WTO in 2001 has affected inflow of FDI in CEEC.

Key Words: FDI (Foreign Direct Investment), China effect, Central and Eastern European Countries (CEEC), EU

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1. INTRODUCTION

Ever since China's accession to WTO in 2001, its trade surged and became a favorite destination for foreign direct investment (FDI) in the world market.

With the accession of WTO, China received US\$52.7 billion in 2002 which made China to become Asia's and the developing world's largest recipient of FDI.¹ China's low labor cost and geographical location which makes easy access to East Asian market adds to become developed countries' popular FDI destination. Adopting further open-up and reform policy, it provided another impetus for attracting foreign investors. Among the many investors, European countries contributed a lot in particular, Western EU member states.

Many developing countries fear that their inflow of FDI could be diverted away into China. Particularly, the Western EU member states who have long been the largest investors of Central and Eastern European countries have recently declared to strengthen their economic relationship with China by increasing their outflow of FDI. There have been rising concerns whether Western EU countries' FDI to Central and Eastern EU countries has been substituted to China.

In this paper, we would like to examine whether the Western EU countries have diverted their foreign direct investment away from Eastern EU countries due to

¹ Wu, Y. (1999). "Foreign Direct Investment and Economic Growth in China". Cheltenham, UK; Northampton, MA, E.Elgar.

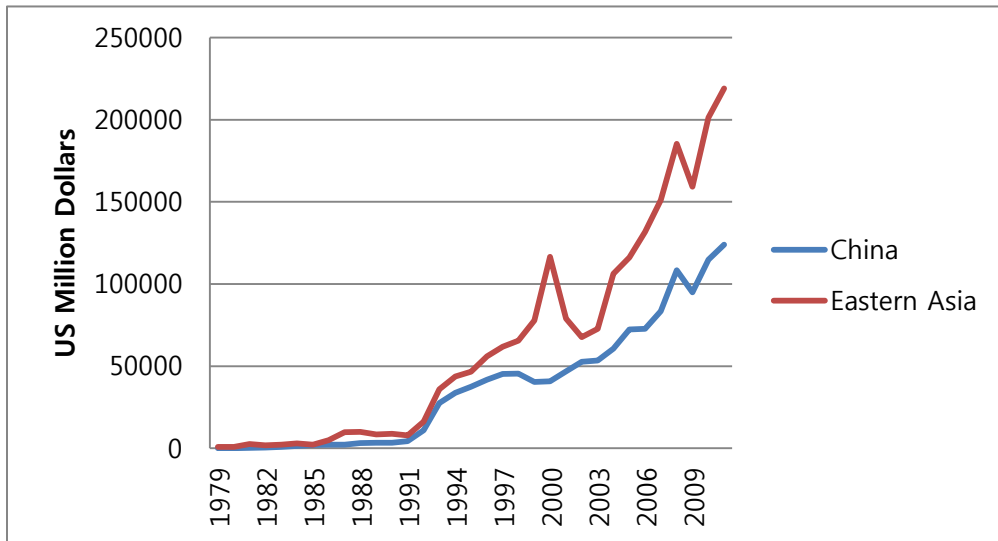
increasing emergence of China through empirical tests. Section 2, 3 will explain the overview of FDI inflows into China over the past few years and discuss previous literatures on the effect of FDI inflows into China. Sections 4-6 will present hypothesis regarding the test and empirical models I will use. Then Sections 7-8 will set out the results and analysis. Lastly, conclusion will be drawn in Section 9.

2. BACKGROUND

China's inward Foreign Direct Investment has been increasing rapidly during the past 20 years. China surpassed United States to become the largest FDI recipient accounting 9.88% of global flows of FDI.² Figure 1 shows the annual value of FDI inflows. It is clear that the value more than doubled in 1992 as compared to 1991, and grew rapidly until 1997, when the financial crisis hit in the region. After China joined WTO in 2001 and decided to open up its foreign trade policy, their FDI inflow revived and is still continuing.

² China Foreign Investment Report, Ministry of Commerce. World Investment Report 2003.

[Figure2-1] FDI Flows into China 1979-2011



Source: UNCTAD

The figure also shows FDI inflows into China as compared to East Asia. It is apparent that more than half of East Asia's FDI inflow comes from China.

Since 1979, more than 200 countries have invested in China. Figure 2-2 shows top ten source countries of FDI in China from 1979 to 2005.

[Figure2-2] Top Ten Source Countries of FDI in China from 1975 to 2005

Rank	Country	FDI Value (in US \$billions)	% of Total FDI Inflows to China
1	Hong Kong	288.948	46.62%
2	Taiwan	62.119	9.98%
3	United States	54.385	8.74%
4	Japan	53.445	8.59%
5	South Korea	31.318	5.03%
6	Singapore	28.956	4.65%
7	United Kingdom	13.287	2.13%
8	Germany	11.517	1.85%
9	France	7.47	1.2%
10	Netherlands	6.967	1.12%

Source: China Foreign Investment Report 2006, Ministry of Commerce

Although the percentage is small compared to the others, four EU countries have maintained strong investment relationship with China: United Kingdom, Germany, France, and the Netherlands. There has been a substantial increase of two-way investment flows over the past five years.

EU was China's top trading partner and China is EU's second largest trading partner after the United States since 2004. During the European Chamber Conference "China's Investment in Europe: Opportunities and Challenges." H.E. Ederer has firmly expressed further enhancement of investment relationship between China and the EU. Since the Central and Eastern EU countries (CEECs) share similar characteristics (low cost of production and labor) in terms of attractiveness, they fear that their inflow of FDI may be diverted away into China. European FDI flows into China account for some 10% of all FDI. FDI flows into China soared from a very modest level in the early 1990s to reach US\$52,700 million in 2002 and this is

almost twice the level of FDI inflows into Central and Eastern Europe.³ Table 2-1 presents that over 60 percent of the FDI inflows to CEEC come within the Western EU countries. Since Western EU's FDI is a very important source of economy in CEEC, they believe that emerging China's impact on them would be dreadful.

[Table2-1] Share of FDI stock by country of origin, as of December 1999

Origin Country	Bulgaria	Czech Republic	Hungary	Poland	Romania	Slovakia
EU	60.2	82.7	76.9	63.8	56.8	74.5
Austria	4.5	11.5	11.7	2.3	5.1	16.9
France	3.0	4.7	6.1	11.0	7.1	4.2
Germany	15.3	29.6	28.0	17.3	10.2	22.0
Italy	1.2	0.9	3.2	9.1	7.6	1.6
Netherlands	6.0	27.1	15.5	9.2	11.6	15.0
UK	5.7	4.7	6.4	5.9	5.1	9.1

Source: UNCTAD (2001).

Therefore, it is important to empirically analyze whether the Western EU countries have diverted their investment to China that was originally going to CEEC.

3. LITERATURE REVIEW

The question is whether China has diverted FDI away from CEEC economies.

There already have been many literatures on whether some regions have been

³ *European Competitiveness Report 2004*, pp.353-354; see also European Commission, A Maturing Partnership- Shared Interests and Challenges in EU-China Relations, Brussels, COM (2003) 533 final, 10 September 2003.

affected by “China Effect” and impact on regions was different.

Mercereau (2005) analyzed the impact of China’s emergence on FDI flows to 14 Asian countries using data from 1984 to 2002. His study finds that showed no evidence of China’s success in attracting FDI was at the expense of other countries in the region with exception of Singapore and Myanmar. Also low wage economies which compete against China for low-wage investment do not appear to have been affected by china’s emergence as well.

Ravenhill (2006) also studied whether China is an economic threat to Southeast Asia. The evidence presented that economic competition between ASEAN and China is misplaced. Although the amount of inflows to ASEAN was disappointing, it is not as bad as compared to that of China. He adds that ASEAN’s performance on FDI is even better when looking at stocks rather than the flows of foreign investment.

Moreover, *Chantasasawt et al. (2004)* examine empirically the question of whether China has diverted FDI away from a group of Asian economies including Hong Kong, Taiwan, Republic of Korea, Singapore, Malaysia, Indonesia, Philippines, and Thailand. His results indicate that the ‘China Effect’ is a significant influence in positively related to developing countries in South East Asian economies’ inward direct investment. The level of China’s FDI was found out to be negatively related to those economies’ shares of total Asian inward FDI and shares of total FDI inflows to the developing countries. He also points out that “China Effect” was not

the most important determinant of inward direct investment. Rather, policy and institutional factors were more crucial.

Zhou and Lall (2005) research the effect on South East Asian countries and find no significance in relations of their FDI inflows and FDI in China during the period 1986 to 1991. However, period 1992-2001 show a strong positive and significant impact of Chinese FDI with higher complementarity.

Eichengreen and Tong (2005) empirically analyze the effect on Asia, Latin America, and the OECD. There was little evidence that China's FDI created problems for Latin American countries by limiting their own access to FDI. In the case of Asia, Chinese FDI inflows were complementary with the FDI inflows of other Asian countries which have encouraged inflows into other Asian countries by promoting supply chain production networks. Lastly, there was weak negative coefficient to explain the impact on OECD groups.

Garcia-Herrero and Santabarbara (2004) further examines whether there is a presence of "China Effect" on Latin American countries by splitting the time span from 1995 to 2001 and 2001 and onwards. During the former time span, we hardly find any evidence of FDI dislocation from Latin American countries to China. Contrastingly the effect seems to be present in the latter time span when negotiation for China's WTO membership was finalized in 2000. The study finds no significant correlation of Latin America as a whole region with exception of some countries: Argentina and Columbia seemed to be negatively affected but weakly. Mexico's

FDI inflow was reduced by Chinese inward FDI in a significant way.

Shim (2010) compares the “China Effect” from OECD countries (EU-18, Asia-Korea and Japan, U.S) to South East Asia and Latin America. She came up with the following results:

Source/Host	South East Asia	Latin America
OECD Asia (Korea and Japan)	Strong Substitution Effect	-
OECD U.S	-	Strong Substitution Effect (Except Mexico)
OECD (EU-18)	Strong Complementary Effect	Very Minor Substitution Effect

These empirical studies suggest that China’s increasing FDI inflows do not crowd out but rather, encourage inflows to Asian regions. Latin America was not much influenced by emergence of China. However, there was little sign of effect when China joined WTO in 2001 and began to adopt trade liberalization.

Since there have been many researches examining whether there is a crowd effect of China’s increasing FDI inflows on Asia and Latin America, I would like to empirically analyze its presence in FDIs coming from Western EU to CEEC by using the gravity model, where the FDI is related on to measures of economic size of the source and host countries and the distance between them. This paper will use a modeling equation by including different factors to explain the effect.

4. MODELING

One may wonder that gravity model is only used to predict bilateral trade flows based on bilateral distance and economic size. However, there have been many previous studies that gravity model also has explanatory power in foreign direct investment flows: Countries located at greater distance are less likely to invest due to increased transportation costs. Grosse and Trevino (1996) used gravity model to explain the influences on FDI on the United States over the period 1980 to 1991. It was found that countries with larger economic size and high exports to the U.S would more likely to have more investment. They added that geographical distance to the U.S decreased the amount of FDI from source country. Stein and Duade (2001) also used gravity model to examine the patterns of bilateral outward FDI flows from 28 OECD countries to 63 host countries in particularly focusing on how institutions in host countries affect the inward FDI. Hejazi and Safarian(2002) used an augmented gravity model to explain Canada's FDI patterns with the world and confirmed a link between geographical distance and FDI.

The effect of China's increasing FDI inflows on CEECs will be empirically analyzed with dated panel data of inflow of FDI from Western EU countries. According to the United Nations Statistics Divisions publishes in 2011 considers Western Europe to consist of the following six countries: Austria, Belgium, France, Germany, Luxemburg and the Netherlands. Lastly, I included Italy due to the fact that it is one of the countries with largest trade linkages with CEECs (Tesar, 2010). Same applies for definition of CEEC economies: Bulgaria, Czech Republic,

Hungary, Poland, Romania, and Slovakia. This model analyzes the effect from aggregated source countries (Western EU-7 countries) to individual CEECs.

The time span of our data will start from 1993, since China decided to transform its economy into market-based one by pursuing the “open-door policy” and FDI inflows into China became increasingly important to year 2010 which is the most recent complete data year. In order to see whether China’s accession to WTO has affected Western EU’s investment to CEECs, I added a dummy variable for data starting from 2001. Therefore this paper will compare time spans prior to China’s accession to WTO which is 1993 to 2010 and focus year 2001.

Our dependent variable is annual bilateral inward FDI flows from aggregate Western EU-7 countries (source) towards top six CEECs (host) who are the largest recipients of FDI from Western European countries. The objective variable is the bilateral inward FDI flows from Western EU-7 countries to China.

Control variables which are relevant determinants of FDI are classified into: (i) capital flows, (ii) bilateral flows, (iii) host country factors and (iv) global factors.

The model estimated could be expressed as follows:

$$FDI_{ijt} = \alpha + \alpha_1 FDI_{chinajt} + \alpha_2 Capital\ Flows_t + \alpha_3 Bilateral\ Factors_{ijt} + \alpha_4 Host\ Factors_{it} + \alpha_5 Global\ Factors_t + \varepsilon$$

i= host country (CEECs)

j= home country (Western-EU7)

t= time period

α is constant, α_1 is our interest variable, Western EU-7's investment to China, and the rest ($\alpha_2, \alpha_3, \alpha_4, \alpha_5$) are the coefficients of control variables. ε is the error term.

The basic regression model for inward FDI for CEECs and for China is the following (Model 1):

$$\begin{aligned} \text{LnFDI}_{ij,t} = & \alpha_0 + \alpha_1 \text{LnFDI}_{\text{china},j,t} + \alpha_2 \text{LnFDI}_{\text{west},j,t} + \\ & \alpha_3 \text{LnFDI}_{\text{world},j,t} + \alpha_4 \text{LnExports to Host}_{ji,t} + \\ & \alpha_5 \text{LnExports to West}_{ij,t} + \alpha_6 \text{LnImports from West}_{ij,t} + \\ & \alpha_7 \text{LnBilateral Distance}_{ij} + \alpha_8 \text{LnHost Trade Openness}_t + \\ & \alpha_9 \text{LnHost GDP Growth}_t + \alpha_{10} \text{Corruption Index}_t + \\ & \alpha_{11} \text{Industry Input Price Index}_t + \varepsilon \end{aligned}$$

The empirical model to find out whether China's accession to WTO has affected the inward FDI for CEEC is the following (model 2):

$$\begin{aligned} \text{LnFDI}_{ij,t} = & \alpha_0 + \alpha_1 \text{LnFDI}_{\text{china},j,t} + \alpha_2 \text{LnFDI}_{\text{china},j,t} * \text{DUMMY} + \alpha_3 \text{DUMMY} + \\ & \alpha_4 \text{LnFDI}_{\text{west},j,t} + \alpha_5 \text{LnFDI}_{\text{world},j,t} + \alpha_6 \text{LnExports to Host}_{ji,t} + \\ & \alpha_7 \text{LnExports to West}_{ji,t} + \alpha_8 \text{LnImports from West}_{ij,t} + \\ & \alpha_9 \text{LnBilateral Distance}_{ij} + \alpha_{10} \text{LnHost Trade Openness}_t + \end{aligned}$$

$$\alpha_{11} \text{LnHost GDP Growth}_t + \alpha_{12} \text{LnCorruption Index}_t + \alpha_{13} \text{Industry Input Price Index}_t + \varepsilon$$

5. FDI DETERMINANTS

For capital variables, we include FDI to West and FDI to World. FDI to West is included to see a change whether home countries would reduce FDI to West-EU7. The average correlation of investment within the Western EU countries from 1993 to 2005 was 0.57 (Tesar, 2010). If they decided to increase their FDI to China, the amount of FDI within the West would be reduced. In this context, FDI to West is expected to have a negative sign as FDI to West can be diverted. If investment towards China has increased, West-EU7's FDI to World, meaning FDI to other regions is expected to show a negative sign.

For bilateral variables, we added bilateral exports and imports. This allows us to examine the substitutability/complementarity between exports/imports and inward FDI. According to Grosse and Trevino (1996) that their study supports the notion that FDI is used to preserve markets that were previously established by exports, FDI promotes trade. Therefore coefficient for exports to host country will be positive whereas exports to west will be negative. We predict that home country's import from the West-EU7 to be negative since more trade interaction is expected between Western-EU7 and China due to diversion of FDI flow. The original gravity

model supports that distance matter for trade. Therefore, further the distance, less FDI is likely to occur.

The host factors include host country's GDP growth, corruption index and trade openness. Higher growth rate of GDP lures foreign investors due to its indication of larger potential for doing business. Previous studies have also examined the significance of institutional factors in the determination of FDI. Hines (1995) showed that FDI from the U.S increased rapidly in countries with lower cover corruption rate than more corrupted countries. Since corruption can discourage FDI by inducing higher cost of doing business, it should have a negative sign. While Chantasawat et al. (2004) argue that depending on the type of FDI, the relationship of openness will differ. However, a positive relationship is expected.

Our second model tests whether China's WTO accession has "crowded out" FDI inflows to CEECCs. Time dummy variable for China's WTO accession period has been used Therefore data before 2001(accession period) is 0 and after 2001 is 1.

Finally, we used industry input price index as a global factor which affects inward FDI for CEEC. Since most of the CEEC's main exports were industry inputs, foreign investors will target this sector. The coefficient should have a negative sign as investors will reduce their FDI if the industry input price increases.

In summary, our paper predicts the following for FDI determinants:

Category	Variable	Expected Sign	
		Model 1	Model 2
FDI to China		-	-

Capital Flow	Home FDI to West	-	-
	Home FDI to World	-	-
Bilateral Factors	Home Export to Host	+	+
	Home Export to West-EU7	-	-
	Host import from Home	+	+
	Bilateral Distance	-	-
Host Country Factors	GDP Growth Rate	+	+
	Corruption Index	-	-
	Trade Openness	+	+
Global Factor	Industry Input Price Index	-	-
DUMMY	China WTO		-

6. DATA

FDI to West and FDI to World data are obtained from Stat Extract database by OECD. It offers bilateral investment flows by partner countries in U.S dollars. The list of home and host countries are indicated in the appendix.

Bilateral export and import data are downloaded from United Nations Commodity Trade Statistics Database. The data we used is total annual values of export and import of all types of goods in U.S. dollars.

Bilateral distances are obtained from John Haveman's International Trade Database and City Distance Tool by GEOBYTES. It measures distance in kilometers between two capital cities from home to host countries.

Host country's Gross Domestic Product and control of corruption are downloaded from World Databank. It offers annual data. The control of corruption gives the

country's score on the aggregate indicator in units of standard normal distribution ranging from negative 2.5 to positive 2.5.

Host country's trade openness is sourced from United Nations Commodity Trade Statistics Database. Trade openness is calculated by sum of import and export divided by host country's GDP.

Industry Input Price Index is downloaded from Index Mundi. The data provides prices of industry inputs every month. Therefore, we have calculated the average for the annual index.

7. EMPIRICAL RESULTS

To test the model 1 and 2, I gathered data concerning the extent of foreign direct investment from aggregate EU-7 to each six Central and Eastern European Countries (dependent variable). The tests were run as dated panel regressions. This means that for each host countries had seven source countries from year 1993 to 2010. Table 8A presents the results for testing the model 1.

[Table 7A] Result of FDI from EU-7 to CEEC using Model 1

Independent Variables	Model 1 (Bulgaria)	Model 2 (Czech)	Model 3 (Hungary)	Model 4 (Poland)	Model 5 (Romania)	Model 6 (Slovakia)
Constant	-157.621* (-2.807)	-25.877 (-0.608)	-96.681* (-3.720)	-223.755* (-4.789)	-238.104* (-5.586)	-133.330* (-7.402)

Ln China FDI (Bulgaria)	0.167 (0.796)					
Ln China FDI (Czech)	0.790* (2.679)					
Ln China FDI (Hungary)	-0.072 (-0.294)					
Ln China FDI (Poland)	-0.150 (-0.672)					
Ln China FDI (Romania)	0.512* (2.768)					
Ln China FDI (Slovakia)	-0.124 (-0.794)					
Ln Distance	-2.254 (-1.592)	-0.767 (-0.588)	-2.801* (-2.727)	-5.690* (-3.963)	-3.418* (-2.965)	-1.120* (-2.781)
Ln Host trade Openness	6.973** (2.458)	-2.020 (-1.062)	1.401 (1.125)	6.370* (2.807)	8.997* (4.476)	3.467* (4.092)
Ln Home FDI to West	-0.117* (-3.604)	-0.055 (-0.965)	-0.218* (-5.672)	-0.028 (-0.456)	-0.092* (-2.789)	-0.153* (-4.605)
Ln Home FDI to World	-0.098 (-1.428)	-0.372* (-3.324)	0.015 (0.185)	-0.165 (-1.577)	-0.282* (-4.076)	0.000 (0.004)
Ln Home Export to Host	1.247** (2.136)	1.670 (1.544)	-0.749 (-0.953)	-6.853* (-3.786)	0.343 (0.716)	0.060 (0.126)
Ln Home Export to West	-1.997 (-1.246)	-8.069* (-3.904)	-0.668 (-0.396)	-1.892 (-0.941)	-6.730* (-4.785)	-0.400 (-0.304)
Ln Home Import from West	3.885** (2.137)	11.685* (5.283)	4.390** (2.373)	6.488* (2.947)	10.119* (6.149)	3.469** (2.414)
Ln Host GDP growth	-0.380 (-0.503)	0.471 (1.163)	0.035 (0.132)	-1.414* (-3.353)	-0.627 (-1.874)	0.269 (0.816)
Host Corruption Index	-0.512 (-0.372)	-4.351 (-1.914)	-0.916 (-0.367)	2.072 (1.079)	-9.524* (-3.375)	-0.146 (-0.189)
Industry Input Price Index	-0.036* (-2.599)	-0.036* (-3.995)	-0.017 (-1.347)	0.009 (0.679)	0.020** (2.095)	-0.019* (-2.833)
Adjusted R²	0.874	0.907	0.876	0.854	0.944	0.916
Observation	62	62	72	78	56	66

Note: Numbers in parenthesis show t-statistics

*, **, *** reflect level of significance at 1%, 5%, and 10

According to the results, find evidence that all CEECs have experienced a substitution effect due to China's emergence except for Bulgaria. As it can be seen

on the table, 1% increase in EU-7's outward FDI to China decreases that into Czech Republic by 0.790% (significantly at 1% level) and into Romania by 0.512% (significantly at 1% level).

Most of the determinants showed expected results to support my hypothesis. Since there was a crowd out effect of EU-7's outward FDI to CEECs, FDI within the EU-7 decreased. This also diverted amount of FDI going to rest of the world. Therefore FDI to West (within the EU-7) and FDI to World variable had a negative sign. The distance between the source country and host country's capital city is negatively related.

Along with FDI to CEECs, export to host countries also showed a positive sign. Grosse and Trevino (1996) have proved that amount of existing trade and FDI have a strong relation because firms use both trade and FDI to serve foreign markets since they are viewed as complementary. As export to host countries increased, export within the EU-7 countries showed a negative sign due to diversion of FDI to China. However, source countries' import from the EU-7 continued to have a positive sign despite the FDI diversion to China and decrease in export within Western Europe.

Host country's trade openness had a positive sign. Higher trade openness indicates better opportunities and drive for growth which attracts foreign investors.

Contrastingly, some host country's GDP growth even showed a negative sign though not significant at all. I was expecting positive sign of host country's GDP

growth because higher GDP growth would encourage inward FDI as a sign of business opportunities in larger and richer countries.

A country's corruption index is negatively related with the host country's inward FDI. This proves that investors are reluctant to invest in countries with unstable business environment. Industry input price index negatively affected the host country's inward FDI since investors would reduce their FDI if CEEC (host country)'s main exporting products, industry input price increased.

Now that the result clearly shows EU-7's FDI diversion from CEEC to China, I ran another regression to test how much China's accession to WTO in 2001 has affected FDI flow.

[Table 7B] Result of FDI from EU-7 to CEEC using Model 2

Independent Variables	Model 1 (Bulgaria)	Model 2 (Czech)	Model 3 (Hungary)	Model 4 (Poland)	Model 5 (Romania)	Model 6 (Slovakia)
Constant	-157.233** (-2.541)	-30.985 (-0.501)	-85.66* (-3.699)	-266.170* (-5.370)	-250.140* (-3.549)	-97.410* (-2.488)
Ln China FDI (Bulgaria)	0.222 (1.089)					
Ln China FDI (Czech)		0.713* (2.564)				
Ln China FDI (Hungary)			-0.004 (-0.021)			
Ln China FDI (Poland)				-0.063 (-0.322)		
Ln China FDI (Romania)					0.525* (2.780)	
Ln China FDI (Slovakia)						-0.031 (-0.203)
Ln China FDI*DUMMY	-0.292** (-2.259)	-0.394* (-2.715)	-0.576* (-4.199)	-0.736* (-4.792)	-0.157 (-1.305)	-0.256** (-2.278)
DUMMY (China's WTO)	1.467*** (1.820)	2.121* (2.518)	3.168* (4.498)	2.379** (2.154)	0.739 (0.724)	2.011** (2.426)

Accession)						
Ln Distance	-2.875*** (-1.924)	-0.649 (-0.519)	-1.727*** (-1.792)	-4.751* (-3.755)	-3.351* (-2.873)	-1.145* (-2.955)
Ln Host trade Openness	6.596** (2.109)	-2.168 (-0.768)	0.470 (0.422)	7.955* (3.245)	9.436* (2.773)	1.562 (0.843)
Ln Home FDI to West	-0.150* (-4.267)	-0.120** (-2.050)	-0.269* (-7.588)	-0.128** (-2.195)	-0.108* (-3.052)	-0.167* (-5.017)
Ln Home FDI to World	-0.092 (-1.371)	-0.308* (-2.772)	0.021 (0.291)	-0.138 (-1.505)	-0.267 (-3.773)	0.004 (0.059)
Ln Home Export to Host	0.874 (1.370)	1.565 (1.524)	0.041 (0.056)	-5.745* (-3.607)	0.307 (0.623)	0.049 (0.107)
Ln Home Export to West	-1.960 (-1.261)	-6.740* (-3.355)	-0.025 (-0.016)	-1.443 (-0.822)	-6.377* (-4.416)	-0.244 (-0.194)
Ln Home Import from West	4.207** (2.373)	10.617* (4.996)	3.892** (2.328)	6.500* (3.391)	9.865* (5.926)	3.439** (2.500)
Ln Host GDP growth	-0.407 (-0.555)	0.445 (1.143)	0.042 (0.176)	-1.749* (-3.327)	-0.701 (-1.485)	-0.201 (-0.429)
Host Corruption Index	-0.323 (-0.236)	-3.851 (-1.468)	-0.160 (-0.073)	0.348 (0.146)	-9.163* (-2.667)	-0.223 (-0.291)
Industry Input Price Index	-0.030** (-2.121)	-0.029* (-3.247)	-0.008 (-0.723)	0.007 (0.546)	0.021*** (1.876)	-0.010 (-1.104)
Adjusted R²	0.886	0.886	0.908	0.893	0.946	0.926
Observation	62	62	72	78	56	66

Note: Numbers in parenthesis show t-statistics

*, **, *** reflect level of significance at 1%, 5%, and 10

The result of regression model 2 came out as expected. The presence of China effect is clearly shown. Those who were not affected by China or had complementary effects in model 1 turned out to experience at least some negative effect as China joined the WTO in 2001. 1% increase in EU-7's outward FDI to China decreases that into Poland by 0.063 % (significantly at 1% level).

One thing that is unexpected is that host country's GDP growth turned out to be not significant. In order to analyze the effect individually, we will try to see country by country.

[Table7-1] Result of FDI from WEST EU-7 to Bulgaria

Independent Variables	Model 1 Bulgaria	Model 2 Bulgaria
Constant	-157.621* (-2.807)	-157.233** (-2.541)
Ln China FDI	0.167 (0.796)	0.222 (1.089)
Ln China FDI* DUMMY		-0.292** (-2.259)
DUMMY (China's WTO accession)		1.467*** (1.820)
Ln Distance	-2.254 (-1.592)	-2.875*** (-1.924)
Ln Host Trade Openness	6.793** (2.458)	6.596** (2.109)
Ln FDI to West	-0.117* (-3.604)	-0.150* (-4.267)
Ln FDI to Rest of the World	-0.098 (-1.428)	-0.092 (-1.371)
Ln Export to Host	1.247** (2.136)	0.874 (1.370)
Ln Export to West	-1.997 (-1.246)	-1.960 (-1.261)
Ln Import from West	3.885** (2.137)	4.207** (2.373)
Ln Host GDP Growth	-0.380 (-0.503)	-0.407 (-0.555)
Corruption Index	-0.512 (-0.372)	-0.323 (-0.236)
Industry Input Price Index	-0.036* (-2.599)	-0.030** (-2.121)
Adjusted R²	0.874	0.886
Observation	62	62

Note: Numbers in parenthesis show t-statistics

*, **, *** reflect level of significance at 1%, 5%, and 10

According to Bulgaria's result in model 1, there was no sign of FDI diversion to China at all. However, model 2 still shows complementarity of China's emergence right until China's accession to WTO. China's accession to WTO in 2001 had a minor affect on inflow of FDI to Bulgaria by reducing the amount of investment.

Although Bulgaria has big trade deficit with China, they do not seek to compete against each other. Bulgaria and China have maintained an economic friendly relationship and continues to develop cooperation in terms of economy and investment. The fact that Bulgaria became a member of EU is more attractive since China was looking for a country which could be the major bridge between China and the countries from the EU. According to the Bulgarian Commerce Minister, he added that China is currently encouraging its companies to invest in Bulgaria and is also promoting measures for stimulating imports from the new EU member states. Therefore, Bulgaria and China's relationship is considered as more complementary than competition.

[Table7-2] Result of FDI from WEST EU-7 to Czech Republic

Independent Variables	Model 1 Czech Republic	Model 2 Czech Republic
Constant	-25.877 (-0.608)	-30.985 (-0.501)
Ln China FDI	0.790* (2.679)	0.713* (2.564)
Ln China FDI* DUMMY		-0.394* (-2.715)
DUMMY (China's WTO accession)		2.121* (2.518)
Ln Distance	-2.254 (-1.592)	-0.649 (-0.519)
Ln Host Trade Openness	6.793** (2.458)	-2.168 (-0.768)
Ln FDI to West	-0.117* (-3.604)	-0.120** (-2.050)
Ln FDI to Rest of the World	-0.098 (-1.428)	-0.308* (-2.772)
Ln Export to Host	1.247** (2.136)	1.565 (1.524)

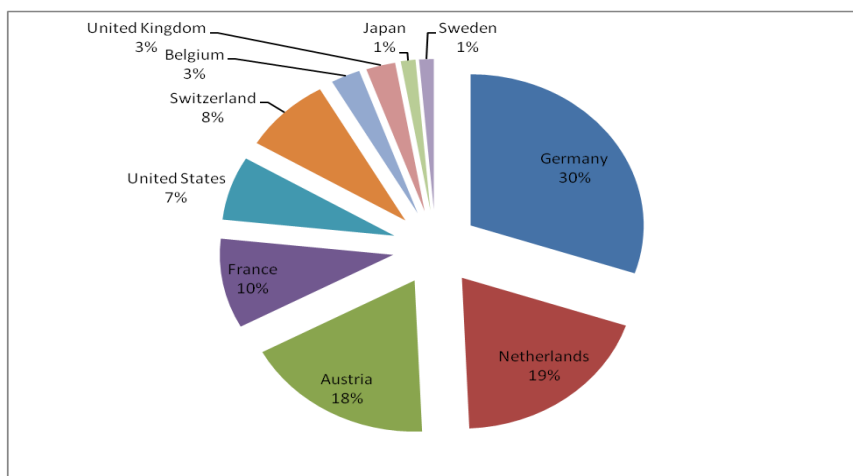
Ln Export to West	-1.997 (-1.246)	-6.740* (-3.355)
Ln Import from West	3.885** (2.137)	10.617* (4.996)
Ln Host GDP Growth	-0.380 (-0.503)	0.445 (1.143)
Corruption Index	-0.512 (-0.372)	-3.851 (-1.468)
Industry Input Price Index	-0.036* (-2.599)	-0.029* (-3.247)
Adjusted R²	0.907	0.886
Observation	62	62

Note: Numbers in parenthesis show t-statistics

*, **, *** reflect level of significance at 1%, 5%, and 10

Impact on Czech Republic is somewhat similar to Bulgaria. They did not experience any substitution during 1993 to 2010 only except reduction in inflow of FDI. Czech Republic is a small player in attracting FDI from Western EU-7 within the CEEC region. Since they are the fifth FDI recipient country within the region, they weren't affected significantly. Of total 97% of FDI in the Czech Republic coming from the OECD countries, 68% of FDI came from European Union members (Table 5). Germany, the largest investor in the Czech Republic accounted 22% of FDI, followed by Netherlands (14%). Among the Western EU-7 countries, Austria accounted 13%, France (7%) and Belgium (2%). Even though there was a sign of reduction in inflow of FDI by Western EU-7, they still seemed to invest constantly.

[Figure7-1] Cumulative FDI Inflow by Country 1993-2011 (Total 77.1 billion Euros)



Source: Czech National Bank, 2012

[Table7-3] Result of FDI from WEST EU-7 to Hungary

Independent Variables	Model 1 Hungary	Model 2 Hungary
Constant	-96.681* (-3.720)	-85.66* (-3.699)
Ln China FDI	-0.072 (-0.294)	-0.004 (-0.021)
Ln China FDI* DUMMY		-0.576* (-4.199)
DUMMY (China's WTO accession)		3.168* (4.498)
Ln Distance	-2.801* (-2.727)	-1.727*** (-1.792)
Ln Host Trade Openness	1.401 (1.125)	0.470 (0.422)
Ln FDI to West	-0.218* (-5.672)	-0.269* (-7.588)
Ln FDI to Rest of the World	0.015 (0.185)	0.021 (0.291)
Ln Export to Host	-0.749 (-0.953)	0.041 (0.056)

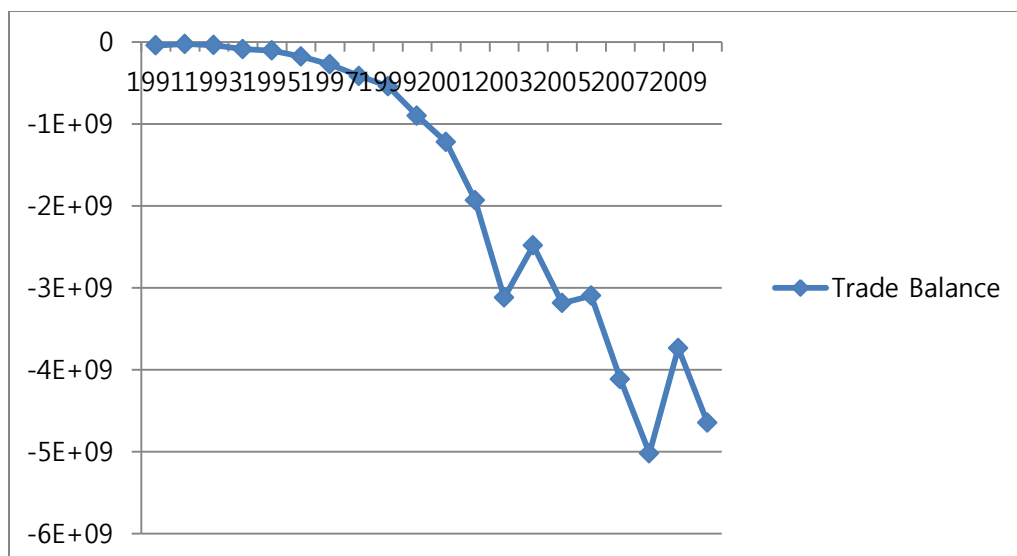
Ln Export to West	-0.668 (-0.396)	-0.025 (-0.016)
Ln Import from West	4.390** (2.373)	3.892** (2.328)
Ln Host GDP Growth	0.035 (0.132)	0.042 (0.176)
Corruption Index	-0.916 (-0.367)	-0.160 (-0.073)
Industry Input Price Index	-0.017 (-1.347)	-0.008 (-0.723)
Adjusted R²	0.876	0.908
Observation	72	72

Note: Numbers in parenthesis show t-statistics

*, **, *** reflect level of significance at 1%, 5%, and 10

Hungary is one of the seriously affected countries by the emergence of China. As model 1 of show, Hungary experienced a serious diversion of FDI to China during period 1993 to 2010. 1% increase in Western EU-7's FDI to China decreases that into Hungary by 0.072%. However they experienced even further substitution effect of 0.576% (significant at 1% level) when China joined the WTO in 2011. Presence of China effect has a strong linkage with China's trade structure. Countries who have a large trade deficit against China will likely experience a FDI substitution effect due to China's emergence. This is the case for Hungary who has a large trade deficit against China (Figure 7-2).

[Figure7-2] Hungary-China Trade Balance



Source: UN Comtrade

In the case of Hungary, FDI to rest of the world variable showed a positive sign and even after China's accession to WTO in 2011. This is because Hungary was the least FDI receiving country within the region and this does not have a big influence on the world flow of FDI.

Since Hungary's main importing partners are Germany, Austria, Netherlands, France, and Italy, and these countries almost take up to 50% of total imports, Hungary still continued to import a lot from the Western EU-7.

[Table7-4] Result of FDI from WEST EU-7 to Poland

Independent Variables	Model 1 Poland	Model 2 Poland
Constant	-223.755* (-4.789)	-266.170* (-5.370)
Ln China FDI	-0.150 (-0.672)	-0.063 (-0.322)
Ln China FDI* DUMMY		-0.736* (-4.792)
DUMMY (China's WTO accession)		2.379** (2.154)
Ln Distance	-5.690* (-3.963)	-4.751* (-3.755)
Ln Host Trade Openness	6.370* (2.807)	7.955* (3.245)
Ln FDI to West	-0.028 (-0.456)	-0.128** (-2.195)
Ln FDI to Rest of the World	-0.165 (-1.577)	-0.138 (-1.505)
Ln Export to Host	-6.853* (-3.786)	-5.745* (-3.607)
Ln Export to West	-1.892 (-0.941)	-1.443 (-0.822)
Ln Import from West	6.488* (2.947)	6.500* (3.391)
Ln Host GDP Growth	-1.414* (-3.353)	-1.749* (-3.327)
Corruption Index	2.072 (1.079)	0.348 (0.146)
Industry Input Price Index	0.009 (0.679)	0.007 (0.546)
Adjusted R² Observation	0.854 78	0.893 78

Note: Numbers in parenthesis show t-statistics

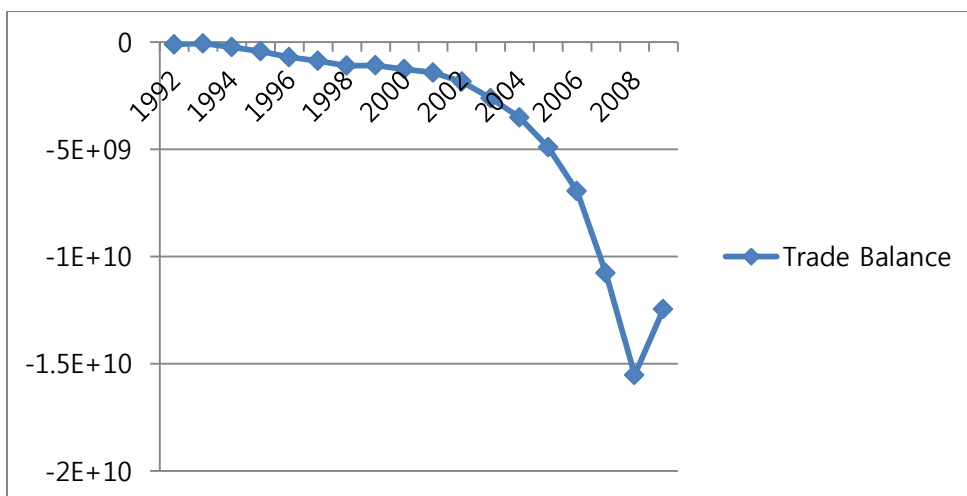
*, **, *** reflect level of significance at 1%, 5%, and 10

Poland's inflow of FDI from the Western EU-7 was crowded out to China during the period 1993 to 2010. Adding to this, FDI into Poland was reduced to 0.736%

(significant in 1% level) in 2001 as China accessed to WTO. Poland experienced a serious substitution among the six considered CEECs.

Similar to Hungary, Poland showed experience of substitution effect and had a large trade deficit against China. Poland is known as China's number 1 trade partner and has the largest trade deficit reaching more than 5.7 billion US dollars (Figure7-3). Despite the fact that Poland is the largest economy among the CEEC and its annual inward FDI tripled from 6 billion to 16 billion US dollars, Poland still experienced China effect.

[Figure7-3] Poland-China's Trade Balance



Source: UN Comtrade

[Table7-5] Result of FDI from WEST EU-7 to Romania

Independent Variables	Model 1 Romania	Model 2 Romania
Constant	-238.104* (-5.586)	-250.140* (-3.549)
Ln China FDI	0.512* (2.768)	0.525* (2.780)
Ln China FDI* DUMMY		-0.157 (-1.305)
DUMMY (China's WTO accession)		0.739 (0.724)
Ln Distance	-3.418* (-2.965)	-3.351* (-2.873)
Ln Host Trade Openness	8.997* (4.476)	9.436* (2.773)
Ln FDI to West	-0.092* (-2.789)	-0.108* (-3.052)
Ln FDI to Rest of the World	-0.282* (-4.076)	-0.267 (-3.773)
Ln Export to Host	0.343 (0.716)	0.307 (0.623)
Ln Export to West	-6.730* (-4.785)	-6.377* (-4.416)
Ln Import from West	10.119* (6.149)	9.865* (5.926)
Ln Host GDP Growth	-0.627 (-1.874)	-0.701 (-1.485)
Corruption Index	-9.524* (-3.375)	-9.163* (-2.667)
Industry Input Price Index	0.020** (2.095)	0.021*** (1.876)
Adjusted R² Observation	0.944 56	0.946 56

Note: Numbers in parenthesis show t-statistics

*, **, *** reflect level of significance at 1%, 5%, and 10

Romania's model 1 and 2 show complementarity. As China joined the WTO in 2001, the amount of Western EU-7's FDI to Romania reduced but still remained complementary. Since Romania is the top FDI recipient among the CEEC, they

were least affected country as well. The Western EU-7 still continued to invest a lot to Romania.

[Table7-6] Result of FDI from WEST EU-7 to Slovakia

Independent Variables	Model 1 Romania	Model 2 Romania
Constant	-133.330* (-7.402)	-97.410* (-2.488)
Ln China FDI	-0.124 (-0.794)	-0.031 (-0.203)
Ln China FDI* DUMMY		-0.256** (-2.278)
DUMMY (China's WTO accession)		2.011** (2.426)
Ln Distance	-1.120* (-2.781)	-1.145* (-2.955)
Ln Host Trade Openness	3.467* (4.092)	1.562 (0.843)
Ln FDI to West	-0.153* (-4.605)	-0.167* (-5.017)
Ln FDI to Rest of the World	0.000 (0.004)	0.004 (0.059)
Ln Export to Host	0.060 (0.126)	0.049 (0.107)
Ln Export to West	-0.400 (-0.304)	-0.244 (-0.194)
Ln Import from West	3.469** (2.414)	3.439** (2.500)
Ln Host GDP Growth	0.269 (0.816)	-0.201 (-0.429)
Corruption Index	-0.146 (-0.189)	-0.223 (-0.291)
Industry Input Price Index	-0.019* (-2.833)	-0.010 (-1.104)
Adjusted R²	0.916	0.926
Observation	66	66

Note: Numbers in parenthesis show t-statistics

*, **, *** reflect level of significance at 1%, 5%, and 10

Slovakia, being the least FDI recipient country within the region experienced substitution effect in both model 1 and 2. Slovakia's inward FDI from Western EU-7 was reduced to 0.031% during the period 1993 to 2010 and was further reduced to 0.256 (significant at 10% level) in 201 as China accessed WTO. Since inward Western EU-7's FDI to Slovakia is relatively small, Slovakia is not their favorite destination for FDI.

8. CONCLUSION

In order to answer the question of whether the Western EU-7 countries have diverted their FDI to China that was originally heading towards Central and Eastern European Countries, we have conducted an empirical analysis by running two regression models focusing on China's accession to WTO in 2001. The regression results of six CEECs have shown that FDI inflows into China have different effects. The findings are summarized as follows.

[Table 9] China Effect in Western EU-7's outflow to CEECs

EU-7's outflow FDI to	Model 1 (1993-2010)	Model 2 (China's accession to WTO)
Bulgaria	Complementary	Very minor substitution effect
Czech Republic	Complementary	Minor substitution effect

Hungary	Substitution effect	Strong substitution effect
Poland	Substitution effect	Strong substitution effect
Romania	Complementary	Minor substitution effect
Slovakia	Substitution effect	Substitution effect

Some of the CEECs were affected by China's emergence during the period 1993 to 2010. After 2001, as China joined the WTO, all countries have experienced China effect. Countries like Bulgaria, Czech Republic, and Romania who maintained a positive relationship with West EU-7's FDI to China seemed to have been somewhat negatively affected by China as well. Although the Western EU-7 seemed to invest in these countries, the amount of their FDI was reduced because of the emergence of a new player, China. Additionally, FDI to rest of the world and FDI within the Western EU-7 reduced as well. Since the portion of inflow FDI in Romania and Slovakia account a very small portion, substitution effect was not a serious one.

Presence of China effect for CEEC has a strong linkage with China-CEECs trade structure. The general characteristic of China-CEECs' trade can be described as relatively small trade volume and high trade imbalance. Hungary and Poland who had the largest trade deficit against China had shown serious crowd out effect by China. Their inflow of FDI was substituted by China and the China effect has been

worsened even further since 2001.

The regression results show that GDP growth rate did not turn out to be as expected.

According to my hypothesis, GDP growth rate should have shown a positive relationship with the inflow of FDI to host country. However, Western EU-7 countries seemed to keep investing in CEECs as long as they are same member states of the EU. In another words, economic progress of the CEECs was not considered as an important factor for investment.

Lastly, host countries still tended to import a lot from the Western EU-7 countries in return to receiving much investment. The results show positive and significant relationship with China's increasing FDI inflow. As Western EU-7 countries are the largest investors for most of the CEECs, they still seems to accept a lot of import.

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APPENDIX

Table 1. Considered Countries

EU-7 (Source Countries)	CEECs (Host Countries)
Austria	Bulgaria
Belgium	Czech Republic
France	Hungary
Germany	Poland
Luxemburg	Romania
Netherlands	Slovakia
Italy	

Table 2. Data Sources and Description

Variable Type	Name	Description	Source
Capital flow	Home FDI to West Home FDI to World	Net flows of investment to acquire a lasting management interest in an enterprise operating in an economy other than that of the investor	OECD International Direct Investment database
Bilateral Factor	Home Export to Host	Export and import of all types of goods in unit currency U.S dollars	UNcomtrade
	Home Export to EU-7		
	Home Import from Host		
	Bilateral Distance	Measures great circle distances in kilometers between capital cities from	John Haveman's International Trade Database and City Distance Tool by

		home to host countries	GEOBYTES
Host Country Factors	GDP Growth Rate	Annual percentage growth rate of GDP at market prices based on constant 2000 U.S dollars	Worldbank Databank
	Corruption Index	Units ranging from 0 to 10 and 0 implies that country is most corrupted while 10 implies least corrupted	Environmental Governance and Institution by World Resource Institute
	Trade Openness	Sum of export and import divided by GDP	Worldbank Databank UNcomtrade
Global Factor	Industry Input Price Index	Commodity industrial inputs price index, 2005=100, includes agricultural raw materials and metal price indices	Index Mundi

중국의 부상이 중동유럽으로 향하는 EU-7의 해외직접투자에 끼치는 영향

홍유정

국제통상학

국제대학원

중국은 낮은 임금과 높은 생산성, 지리적으로 동아시아 시장의 쉬운 접근성을 가진 비교우위로 인해 외국인들이 가장 좋아하는 투자지로 꼽히고 있다. 이로 인해 빠른 경제 성장으로 이루며 점차적으로 시장을 개방하고 더욱 빠르게 부상했다.

2001년에는 WTO에 가입하며 외국인 직접투자 유치규모 연평균 9.5%씩 성장하며 전 세계 투자 유치 2위국으로 등극했다. 중국의 경제 자유화와 시장 개방을 이행함으로써 많은 선진국가의 해외직접투자를 받던 개도국들에게도 중국과의 치열한 경쟁은 불가피하다. 특히 동유럽과의 활성화한 무역관계와 투자관계를 유지하던 유럽연합(EU) 중에서도 서유럽 국가들은 앞으로 중국과의 경제관계를 더욱 돈독히 할 것을 밝힌 바 있다.

기존 연구에 따르면, 중국의 경제 부상은 동남아로 향하는 해외직접투자를 이전하는 영향을 찾아볼 수 없었으며 오히려 상호보완의 역할을 해왔다. 반면, 중국의 성장이 몇몇 중남미 지역의 해외직접투자 규모를 위협한다는 결과를 보여주었다.

이 논문은 중국의 활발한 투자국인 유럽연합(EU) 중 서유럽 7국가들 (오스트리아, 벨기에, 프랑스, 독일, 룩셈부르크, 네덜란드, 이태리)로 구분하여 중국의 부상이 같은 유럽연합(EU) 회원국인 동유럽 지역(불가리아, 체코, 헝가리, 폴란드, 루마니아, 슬로바키아)의 외자유치에 미치는 영향을 실증 분석하였다. 중국이 시장을 개방하기 시작한 시기인 1993년부터 2010년까지 전체적으로 영향을 살펴보고, 2001년 중국이 WTO에 가입한 시기를 중점으로 영향을 같이 살펴 보았다.

키워드: 외국인직접투자, 중국효과, 동유럽, 유럽연합

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