
The Effects of Financial Development on Foreign Direct Investment

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금융 발전이 외국인직접투자에 미치는 영향에 대한 분석

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Abstract

This study investigates the effects of financial development on the foreign direct investment (FDI) flow in host countries. Using bilateral FDI data from 34 OECD source countries to 146 host countries, we performed panel data analysis based on a gravity FDI equation. We hypothesized that the financial development would increase the volume of FDI flows. The results suggest that the well-functioning finance market of source countries as well as a better accessible financial market of host countries contribute to the increase in FDI of OECD in their partner countries. We found also that the financial development effects of source countries are larger than those of host countries. This result shows that the financial development can play a crucial role to impact the FDI inflows as a push factor in source country than as a pull factor in host countries.

Keywords: Financial Development, Financial Market, Foreign Direct Investment(FDI), Determinants of FDI

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I . Introduction

A number of literature have studied whether or not the spillover effect of foreign direct investment (FDI) exists, and in what conditions, the positive effects of FDI can take place as a whole economy. It is well known the positive effects or channels of FDI on host country as a whole. Crespo and Fontoura (2006) identified 5 channels to impact positively on technology spillovers: (i) Demonstration and Imitation, (ii) Labor mobility, (iii) Exports, (iv) Competition, (v) Backward and forward linkages with domestic firms.

In line with that many papers have also been studied whether growth-enhancing effects exists and in what conditions this should be exploited (De Mello,1997; Borensztein et al., 1998; Rajan and Zingales, 1998; Zhang, 2001; Bengoa and Sanchez-Robles, 2003; Omri and Kahouli, 2014; Pegkas, 2015). Because of positive spillover effect or growth enhancing effect of FDI, as expected by FDI host countries, understanding the determinants of FDI is crucial for not only researchers but also policy makers.

If there positive linkage between FDI and economic growth directly or indirectly under conditions for countries' capacities, and then the question is that: how should the policy makers in a country do in order to attract FDI? Policy makers in developing countries have attempted to attract more FDI in their countries by giving promotion and incentives to foreign investors. The change of liberalization policies attracting FDI has been spread worldwide for the past decades (Korbrin, 2005).

This paper focuses on this question and attempts to investigate the role of financial development as determinant of FDI that could boost economic growth in host country.

As the cross border FDI incurs considerable fixed cost for MNEs, the ability to draw funds through well-functioning financial market in source country and to easily access to the financial market is crucial for FDI location for MNEs (Desbordes and Wei, 2017).

The purpose of this paper is to identify the determinants of FDI by focusing on financial development role as a channel for consideration both source (or investing) and host (or invested) country simultaneously.

II . Literature Review

Crespo and Fontoura (2006) suggested the five channels of FDI spillover and concluded that the existence of FDI spillover depended on absorptive capacity to domestic firms, regional, and recipient FDI characteristics etc. Hermes and Lensink (2003) reported that as one of absorptive capacity well-developed financial system contributes the economic growth and less developed countries with sufficiently developed financial system have a positive effects of FDI on economic growth using variable private sector bank loan to GDP.

Alfaro et al. (2004) found that although FDI were not significant alone, the interaction term with FDI and financial development variables are significant statistically. This result shows that complementary effects of FDI on economic growth, which implies that having well-developed financial markets contributed the economic growth through FDI inflows.

Azman-Saini et al. (2010) also identified the positive impact of FDI on growth only for a degree of financial development exceeds a certain level for 91 countries over the period 1975-2008. And in the paper of Desbordes and Wei (2017) tested positive impact of

financial development of source and host countries on attracting FDI and they found that the increase in access of financial development promotes FDI inflows by using manufacture sector data.

For the single country case of study, Deichmann et al. (2003) focused the determinants of FDI flows in Turkey. Using a conditional logit model to investigate the subnational determinants of FDI, they found that depth of financial market played a significant role to attract FDI inflow. Ang (2008) also investigated the determinants of FDI in Malaysia and found that financial development measured by the ratio of private credit to GDP facilitated FDI inflows for the long period of 1960 -2005. Klein et al. (2002) tested the hypothesis that imperfect capital market could influence firm's ability to engage in FDI and found that the difficulties of access to credit for Japanese firms during the period 1990's decreased FDI into United States.

Even though the precedent researches have extended and enlarged the effects and the determinants of the FDI, the empirical approach to identify financial development as one of the determinants of FDI inflow has not been sufficiently performed, especially in considering the financial development in the source countries and in the host countries simultaneously. According to the approach by Klein et al. (2002), the assumption developing countries have access equally to financial market could not be realistic. And then well-functioning financial market can be crucial factor or channel to attract FDI inflows. This paper contributes to develop the discussion of FDI inflows and their determinants by considering the financial development not only in the host countries but also in the source countries with the bilateral panel data sets from OECD sources,

III. Model and data

To investigate the role of financial development to affect FDI, the paper uses bilateral data sets from 34 OECD countries investing 146 host developing countries. The gravity equation model commonly used in the literature is as follows.

As an analysis of the determinants of FDI, the gravity model is based on the assumption that FDI is proportional to the economic scale between the two countries and inversely proportional to their distance. These basic assumptions are used to verify whether variables of interest actually have a significant effects on FDI by controlling variables such as language sharing between the investing and the invested countries. We set up the gravity model by equation (1) below and then test the financial developments of source country and host country simultaneously.

$$\begin{aligned} \ln(FDI_{sht}) = & \beta_0 + \beta_1 \ln(GDP_{st}) \\ & + \beta_2 \ln(GDP_{ht}) + \beta_3 \ln(DIST_{sh}) \\ & + \beta_4 \ln(FD_{st}) + \beta_5 \ln(FD_{ht}) \\ & + \beta_6 (LANG_{sh}) \\ & + \beta_7 (COLONY_{sh}) \\ & + (TAXHaven_h) \\ & + \beta_9 (LLC_h) + \epsilon_{sht} \end{aligned} \quad (1)$$

Where $t=1985, \dots, 2013$.

Here, subscript s and h represent source countries and host country, respectively. Subscript t represents year. The dependent variable is foreign direct investment (FDI_{sht}) of OECD source country investing other host country. The variable of source and host country GDP (GDP_{st}, GDP_{ht}) and distance (DIST_{sh}) are included in the right side of the equation. The main variable in this paper is financial developments of host and of source country (FD_{st}, FD_{ht}), respectively. And

Table 1. Summary Statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
FDI _{st} (million US\$)	41,585	475.97	2,977.92	-0.90	138,603.00
GDP _{st} (billion US\$)	41,585	1,170.0	2,600.0	3.0	16,000.0
GDP _{ht} (billion US\$)	41,585	120.0	490.0	0.1	9,610.0
DIST _{sh} (km)	41,585	7,399.14	3,991.72	71.35	19,599.53
FD _{st} (%)	41,585	92.79	44.94	8.69	262.46
FD _{ht} (%)	41,585	35.69	31.93	0.24	260.70
LANG _{sh}	41,585	0.08	0.27	0	1
COLONY _{sh}	41,585	0.02	0.16	0	1
TAX Haven _h	41,585	0.16	0.36	0	1
LLC _h	41,585	0.18	0.38	0	1

language tie (Langsh), colonial experience of host country (COLONYsh), tax haven (TAX Havenh), and landlocked county (LLCh) are all considered as dummy variables in the equation. Langsh takes a value of 1 if source and host countries share language and zero otherwise. COLONYsh dummy variable takes a value of 1 if host countries have colonial experiences for OECD countries and zero otherwise. TAX Havenh and LLC_h dummy variables take a value of 1 if host countries are designated to tax haven and landlocked countries and zero otherwise, respectively. Except for dummy variables, all variables are taken natural logarithms. Summary statistics of the variable employed are listed in the Table 1.

The coefficients of GDP of source and host countries are expected to be positive and the coefficients of distance are expected to be negative as anticipated in gravity model. The coefficients of financial development are expected to have positive signs. The financial development in the source countries can play a role to invest abroad more as a 'push factor' and on the other hand the financial

development in the host countries can perform positive effects to attract foreign direct investment as a 'pull factor'. The coefficients of language tie and colonial experience dummy variables are expected to be positive. The coefficients of tax haven dummy are expected to have positive signs and the coefficients of landlocked countries dummy are expected to have negative signs, respectively. Bilateral data between 34 OECD and 146 counties for the period from 1985 to 2013 are used for panel data analysis. The data sources of variables are in (Appendix A).¹ and the list of countries in Appendix A.².

IV. Results of Empirical Analysis

The estimation results are shown in (Table 2) and (Table 3). The FDI data are added to one in the original FDI data before taking the logarithm. The results of pooled OLS are listed in (Table 2).

The coefficients of the logarithm of the source and host country's GDP are all

Table 2. Financial Development on FDI : Benchmark Pooled OLS Regression.

Estimation method Dependent variable	(1)	(2)	(3)
	Pooled OLS ln(FDI _{st} +1)		
ln(GDP _{st})	0.727*** (0.006)	0.689*** (0.006)	0.687*** (0.006)
ln(GDP _{ht})	0.519*** (0.005)	0.530*** (0.005)	0.581*** (0.005)
ln(DIST _{sh})	-0.647*** (0.015)	-0.641*** (0.015)	-0.656*** (0.015)
ln(FD _{st})	0.829*** (0.016)	0.746*** (0.016)	0.870*** (0.016)
ln(FD _{ht})	0.403*** (0.010)	0.411*** (0.010)	0.308*** (0.011)
LANG _{sh}		0.448*** (0.041)	0.336*** (0.039)
COLONY _{sh}		2.203*** (0.060)	2.100*** (0.061)
TAX HAVEN _h			0.615*** (0.032)
LLC _h			-0.256*** (0.020)
Constant	-28.912*** (0.247)	-27.993*** (0.246)	-27.888*** (0.326)
Year dummy included	No	No	Yes
Observations	41,585	41,585	41,585
R-squared	0.537	0.558	0.586
Number of country	146	146	146

Note : 1. Robust standard errors in parentheses.

2. *** p<0.01, ** p<0.05, * p<0.1

3. Coefficients for year dummy variable now shown.

positive and significant at 1% in column (1) to (3). And the coefficients of distance are negative and significant at 1% level as expected as gravity model. The financial development variables, which is proxied by private credit to as a percentage of GDP are all positive and statistically significant at 1% level.¹⁾ This implies that financial development

would be positive effects on FDI inflows: especially the effects of well-functioning financial market on location FDI in the OECD source countries is larger than that in host countries.²⁾

The coefficients of language tie (Lang), and colonial experiences (COLONY) dummy variables in column (2) are all positive and significant at 1% levels. This shows that common language and colonial experience could be helpful to attract more FDI flows in

1) Private sector credit, which equals the value of credit issued by financial intermediaries to the private sector divided by GDP is the widely used indicator to show the efficiency of banking sector in credit provision (Levine et al., 2000; Azman-Saini et al, 2010)

2) $FD_{st} / FD_{ht} = [\exp(0.829-0.403)-1]*100 = 53\%, 40\%$ and 75% from column (1) to (3) in Table 2.

Table 3. Financial Development and FDI : Fixed, Random, and Tobit Estimation Results

Estimation method Dependent variable	(4)	(5)	(6)
	Fixed effects	Random effects ln(FDI _{st} +1)	Tobit
ln(GDP _{st})	0.674*** (0.005)	0.674*** (0.005)	0.674*** (0.005)
ln(GDP _{ht})	0.295*** (0.036)	0.446*** (0.019)	0.381*** (0.028)
ln(DIST _{sh})	-1.237*** (0.016)	-1.191*** (0.016)	-1.225*** (0.016)
ln(FD _{st})	0.958*** (0.015)	0.951*** (0.016)	0.956*** (0.015)
ln(FD _{ht})	0.306*** (0.024)	0.299*** (0.022)	0.301*** (0.023)
LANG _{sh}	0.135*** (0.033)	0.150*** (0.033)	0.138*** (0.033)
COLONY _{sh}	2.208*** (0.054)	2.204*** (0.054)	2.207*** (0.054)
TAX HAVEN _h		0.472*** (0.115)	0.346* (0.210)
LLC _h		-0.339*** (0.099)	-0.414** (0.186)
Constant	-16.988*** (0.810)	-22.051*** (0.491)	-20.205*** (0.704)
Observations	41,585	41,585	41,585
Year dummy included	Yes	Yes	Yes
R-squared	0.466	0.465	-
Number of country	146	146	146

Note : 1. Robust standard errors in parentheses.

2. *** p<0.01, ** p<0.05, * p<0.1

3. Coefficients for year dummy variable now shown.

host countries. The coefficient of Tax Haven dummy variable is positive and significant at 1% level and the coefficient of landlocked countries dummy variables is negative and significant at 1% level in column (3). This means that host countries designated as tax haven would attract FDI more from source countries. However, the landlocked countries could receive less FDI flows.³⁾

As used panel data in equation above, the results of re-estimated are listed in <Table 3> such as the fixed effects, random effects, and panel Tobit estimation from column (4) to (6). The coefficients of GDPs of source country and of host country have positive and statistically significant at 1% level.

3) The 30 landlocked countries are included: Afghanistan, Armenia, Azerbaijan, Bhutan, Bolivia, Botswana, Burkina Faso, Burundi, Central African Republic,

Chad, Ethiopia, Kazakhstan, Kyrgyzstan, Laos, Lesotho, Macedonia, Malawi, Mali, Moldova, Mongolia, Nepal, Niger, Paraguay, Rwanda, South Sudan, Swaziland, Tajikistan, Uganda, Zambia, Zimbabwe.

This means that the larger economy size, the more FDI inflows in host countries. The coefficients of distance are all negative and significant at 1% levels. This implies that the longer distance from source country, the less FDI flows in host country. The coefficients of financial development of source country and of host country, $\ln(\text{FDst})$, $\ln(\text{FDht})$, are all positive and statistically significant at 1% level. According to the results of (Table 3), the well-functioning financial market in source country could induce more FDI in the partner countries as push factor, and, on the other hand, more accessible financial market in host countries could make also MNEs to invest in their countries as pull factor. When comparing the coefficients of the financial development, the well-functioning financial market in source country as push factor is more crucial than that of host country for the FDI location.⁴⁾

The coefficients of language tie, colonial experience, and tax haven dummy variables have all positive and significant at 1% level. The coefficients of landlocked country dummy variable are negative and significant at 1% level. These imply that common language, colonial experience in the past, and tax haven could attract more FDI in host country, but the landlocked country tends to receive FDI less from source countries.

V. CONCLUSION

A lot of researches have been focused on investigating the determinants of FDI and its

channels to positively affect economic growth as an effective vehicle. Previous researches have reported that financial factor has been important to locate FDI for MNEs in host countries. However, as they have been concentrated mainly on the financial development in host countries, so far they have had limitations in looking at the financial development in source countries at the same time. This paper used the gravity model and focused on the role of financial development of both source and host countries simultaneously. With bilateral data from 34 OECD sources and other 146 host countries, we found that the financial development would play a crucial role to FDI inflows in host country. Our hypothesis to test in this paper is that the well-functioning financial market would increase MNEs' ability to increase their usable funds and then to expand financial constraint in their home country. An easy access to the financial market would contribute to more FDI location by lowering the financial friction in host countries.

We found that financial development could increase FDI flows in host countries all other things being equal. And the role of financial development as push-factor in source country would be larger for FDI location than that of financial factor as pull-factor in host country.

Therefore it can be concluded that financial development should be considered as one of determinants of FDI regardless of source and host countries. The growth-enhancing effects of FDI as a channel of financial development remain for future studies to be done.

4) In a case of column (6) in Table 3, the financial development in source countries would increase 93% more of FDI inflows than that in host countries.

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Appendices

A1. Data sources and definition.

FDI inflows: OECD FDI statistics database (<http://stats.oecd.org>).

Distance: Latitude and longitude data are obtained from

<https://simplemaps.com/data/world-cities> and calculated by Stata-built in function from (Ozimek and Miles, 2011)

GDP, Private credit to as a percentage of GDP: World Development Indicator, World Bank. Language, Colonial: Central Intelligence Agency (CIA), the World Factbook,

Tax Haven dummy: Dharmapala and Hines (2009).

Landlocked country dummy: UNCTAD Website(<http://unctad.org/en/Pages/Home.aspx>).

A2. List of countries

Table A. List of Source countries

1	Australia	13	Hungary	25	Poland
2	Austria	14	Iceland	26	Portugal
3	Belgium	15	Ireland	27	SlovakRepublic
4	Canada	16	Israel	28	Slovenia
5	Chile	17	Italy	29	Spain
6	Czech Republic	18	Japan	30	Sweden
7	Denmark	19	Korea	31	Switzerland
8	Estonia	20	Luxembroug	32	Turkey
9	Finland	21	Mexico	33	UnitedKingdom
10	France	22	Netherlands	34	UnitedStates
11	Germany	23	NewZealand		
12	Greece	24	Norway		

Table B. List of host countries

1	Afghanistan	39	Dominica	77	Lithuania	115	Senegal
2	Albania	40	Dominican Republic	78	Macedonia	116	Serbia
3	Algeria	41	East Timor	79	Madagascar	117	Seychelles
4	Angola	42	Ecuador	80	Malawi	118	Sierra Leone
5	Antigua and Barbuda	43	Egypt	81	Malaysia	119	Singapore
6	Argentina	44	El Salvador	82	Maldives	120	Solomon Islands
7	Armenia	45	Equatorial Guinea	83	Mali	121	South Africa
8	Aruba	46	Eritrea	84	Malta	122	South Sudan
9	Azerbaijan	47	Ethiopia	85	Mauritania	123	Sri Lanka
10	Bahrain	48	Federated States of Micronesia	86	Mauritius	124	Sudan
11	Bangladesh	49	Fiji	87	Moldova	125	Suriname
12	Barbados	50	Gabon	88	Mongolia	126	Swaziland
13	Belarus	51	Georgia	89	Montenegro	127	Syria
14	Belize	52	Ghana	90	Morocco	128	Tajikistan
15	Benin	53	Grenada	91	Mozambique	129	Tanzania
16	Bhutan	54	Guatemala	92	Myanmar	130	Thailand
17	Bolivia	55	Guinea	93	Namibia	131	The Bahamas
18	Bosnia and Herzegovina	56	Guinea Bissau	94	Nepal	132	The Gambia
19	Botswana	57	Guyana	95	Nicaragua	133	Togo
20	Brazil	58	Haiti	96	Niger	134	Tonga
21	Brunei	59	Honduras	97	Nigeria	135	Trinidad and Tobago
22	Bulgaria	60	India	98	Oman	136	Tunisia
23	Burkina Faso	61	Indonesia	99	Pakistan	137	Uganda

24	Burundi	62	Iran	100	Panama	138	Ukraine
25	Cambodia	63	Iraq	101	Papua New Guinea	139	United Arab Emirates
26	Cameroon	64	Ivory Coast	102	Paraguay	140	Uruguay
27	Cape Verde	65	Jamaica	103	Peru	141	Vanuatu
28	Central African Republic	66	Jordan	104	Philippines	142	Venezuela
29	Chad	67	Kazakhstan	105	Qatar	143	Vietnam
30	China	68	Kenya	106	Romania	144	Yemen
31	Colombia	69	Kuwait	107	Russia	145	Zambia
32	Comoros	70	Kyrgyzstan	108	Rwanda	146	Zimbabwe
33	Congo (Brazzaville)	71	Laos	109	Saint Kitts and Nevis		
34	Congo (Kinshasa)	72	Latvia	110	Saint Lucia		
35	Costa Rica	73	Lebanon	111	Saint Vincent and the Grenadines		
36	Croatia	74	Lesotho	112	Samoa		
37	Cyprus	75	Liberia	113	Sao Tome and Principe		
38	Djibouti	76	Libya	114	Saudi Arabia		