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Paradox of Developing Country Foreign Direct Investments: A Case of the South Korean Electronics Industry

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Abstract: Foreign direct investments have been done in the environment that wide international wage gaps still exit. On top of it, we see that worldwide regionalism has been proliferating. In this paper, we can reach the conclusion that these two factors are largely responsible for why many South Korean firms in capital-intensive industry have invested in developed countries to produce as much as or more valued goods than home. If the trend continues, such foreign direct investments will hollow out the South Korean economy not only quantitatively but also qualitatively. The companies may gain but the economy is to lose.

Key words: Foreign direct investment, developing country multinational corporations, worldwide wage difference, regionalism, quantitative and qualitative hollowing-out effect

A puzzle: On June 11, 2001, LG, a South Korean conglomerate, *chaebol* , announced that one of its subsidiaries, LG Electronics had decided to locate the head office of its planned joint venture with Philips of the Netherlands, to be called LG Philips Display, in Amsterdam in the Netherlands [*Chosun Il-bo*(Daily *Chosun*), June 12, 2001]. LG expected that the new company would be the largest Brown tube maker in the world, with a production capacity of 80 million units a year and 27.7 percent global market share [*Chosun Il-bo* (Daily *Chosun*), June 12, 2001]. LG Philips Display is believed to be the first large South Korean company to set up the head office of a joint venture overseas.

This unprecedented movement by LG Electronics lends us two worries, among which one is rather known but the other is not. First, we believe that foreign direct investment (henceforth, FDI) could bring about many side effects--increase in unemployment, decrease in exports, reduction in domestic production, etc.--to the home economy. LG Philips Display won't be an exception. Second, what LG Philips Display is going to do bothers us also. The company's above-mentioned plan points out that it will produce in Europe one of LG's high-end products. This strategy is quite different from the typical, or thought of as such, FDI arrangement that the facilities in home country carry out higher value-added activities, including management and R&D, than those in host region. Because the usual FDIs have been claimed to help the international competitiveness in the concerned domestic industry enhanced, LG Philips Display could work contrarily, we can imagine. The company may gain through the FDI, but the economy could lose another way.

Then, is LG Philips Display a good evidence revealing problems specific to developing country FDIs? The answer relies on how economically rational the LG Electronics' FDI is, which the current studies do not help us much to solve. If the attempt to found head office in foreign country and produce high valued products there is particular to LG Electronics, whatever reason, we do not need be anxious about its effect on the national economy any longer. On the other hand, if the tactic turns out to be reasonable or necessary for the other South Korean firms in capital-intensive industry to follow suit, we can expect that eventually, such FDIs would hurt the economy as a whole, because they could hollow out the South Korean economy not only quantitatively, as the developed country multinational corporations (hereafter, MNCs) presumed to have done to their respective home economies, but also qualitatively by wearing away the growth potential.

Model and Hypothesis: We find two features of LG Philips Display worth to consider. First, LG Philips Display resulted from the FDI done by a developing country firm--South Korea's LG Electronics--in a developed region--the Netherlands. As Table 1 shows, there still exist significant international wage gaps. In this respect, we can say that the LG Electronics FDI is a transfer of capital from relatively low-paying or low labor-cost region to relatively high-paying or high labor-cost.

Table 1: Hourly compensation costs in U.S. dollars for production workers in manufacturing in selected regions in 1999

OECD less Mexico and South Korea*	Europe	Asian NIEs**
18.80	20.31	6.20

Note: 1) *: Organization for Economic Cooperation and Development
2)**: Newly Industrializing Economies, which include South Korea, Hong Kong, Singapore and Taiwan.
Source: U.S. Department of Labor, Bureau of Labor Statistics, 2000

Second, LG Philips Display was established through LG Electronics' investment in EU, European Union. It is not too much to say that still largely, FDIs belong to capital-sufficient developed economies. According to World Investment Report 2000, in 1999 alone, developed countries took over 78% and 91% of the world FDI inflows and outflows respectively. Why MNCs have tried to invest in these regions? We can find an answer in rising regionalism in the world economy.

In Table 2, we detect that EU and NAFTA, comprising European and North American developed countries, are retaining higher economic interdependence among the members than any other group. Coincidentally, the world FDI activities have been concentrated in these regions. It appears that as Horst(1973) expected, trade and non-trade barriers are more effective for attracting inward FDIs in the country with larger market than one with smaller. Then, how the international wage difference and economic regionalism affect the behavior of developing country MNCs? To analyze it, by referring to Emmanuel (1972), we can devise a simple economic system like in the below. We let Region A and B represent developed and developing countries separately. Labor productivity and organic composition of capital are higher in Region A than B. As we know, the fact that labor is paid more in Region A than B works behind the scenes. Here, we presume that Region A restricts trade but allows FDIs instead. In this situation, the Region B firms capable of producing high-end products, about which Region A provides larger market, will be tempted to invest in Region A. It means that they are going to produce in Region A's environment. It is certain that they should invest variable and constant capital more than before. What other changes the Region B firms are expected to undergo?

First of all, in Region A, to make profits, they should produce products valued more than 310 [=240 (constant capital in Region A)+70(variable capital in Region A)], which are more capital-intensive than those in Region B naturally. To derive a sufficient condition for their survival, we need consider the opportunity cost of their FDIs. If the developing country MNCs try to garner the surplus value as much as before, they must engage in manufacturing the goods worth at least 380 [=310 (capital investment in Region A)+70(surplus in Region B)]. Producing in Region A, the Region B firms are to experience sharp drops in the rate of surplus value, s/v, and that of profit, s/(c+v)--from 1.4 and 0.411 to 0.714 and 0.161 respectively. To maintain the previous records, they should yield the products appraised as no less than 408[=310 (capital investment in Region A)+(310x1.4)] and 438[=310(capital investment in Region A)+(310x0.411)] separately. That is, they should produce higher valued goods than even their developed country contenders. However, as we know, Khan(1986), Dunning(1986), UN(1993), etc. have insisted that by establishing facilities in developed region, developing country firms could take advantage of more productive labor and advanced technology there. In Fig. 1, we find that the labor productivity--*V/v*--in Region A is higher than in Region B. It appears that the MNCs from Region B could mitigate the upward surge of labor cost with increased efficiency. Nevertheless, our system shows that to make use of the difference in labor productivity fully, developing country MNCs should manufacture the products worth at least 310 in Region A. In every respect, to survive international competition, they must make higher valued goods in Region A than B.

Therefore, LG Electronics' strategy to produce higher valued goods in developed region than in South Korea seems economically reasonable, when both international wage differences and economic regionalism are taken into account. Accordingly, we can hypothesize as follows:

In capital-intensive industry, the South Korean MNCs tend to produce more valued goods abroad than in South Korea, because there exist international wage gaps and economic regionalism governs FDI flows.

Region	c	v	s	V(=c+v+s)	V/v	s/v	c/v	s/(c+v)
A	240	70	50	360	5.14	0.714	3.42	0.161
B	120	50	70	240	4.8	1.4	2.4	0.411

Fig. 1: Simple system of the world economy involving high labor-cost and low labor-cost countries

Table 2: Intra-trade of groups as percentage of total exports of each group

Region	1990	1998
APEC	65.5	66.3
EU	65.9	61.6
NAFTA	41.4	51.7
MERCOSUR	8.9	25.1
COMESA	6.6	7.2
SADC	3.1	4.7
ASEAN	19.0	20.8

Source: UNCTAD (2000a)

Materials and Methods

First, we need make sure that the simple system, Fig. 1, is valid. Second, we should establish that internationally, the higher the labor cost is, the more capital the South Korean MNCs have invested. It will prove that the more capital-intensive the industry is, the more the firms have preferred developed to developing countries as their overseas production sites. Third, we are required to delve into what kind of products the South Korean foreign subsidiaries have been manufacturing. We anticipated that in the country whose labor costs more than in South Korea, the MNCs will produce higher valued goods. That other developed country MNCs have arranged their foreign production according to labor cost will solidify our inference. Fourth, it is necessary to know how economic regionalism has really influenced the South Korean MNCs. It will explain why they have opted FDIs in developed countries over trade with them.

Empirical Evaluation

Validity of the System: We can easily ascertain a positive relationship between labor cost--v--and per capita GDP--V. In Table 3, we find that in the country where labor costs dearer, workers use more capital stock in production--c/v--and record higher value-added, productivity--V/v.

Table 3: The real world economy

Country	Annual average labor cost per worker in manufacturing in 1990-94 in current US dollars[1)]	Capital stock per worker in 1990 in 1985 international prices in US dollars[2)]	Value added per worker in manufacturing in 1990-94 in current US dollars[1)]	Total operating surplus in manufacturing / total compensation of employees in manufacturing in 1990[3)]
Germany	33,226	50,116**	79,616	0.1511***
Netherlands	39,865*	32,380	56,801	0.6362
Sweden	29,043*	39,409	56,675	0.1771
U.S.A.	28,907	34,705	81,353	0.2731
U.K.	23,843	21,179	55,060	0.2240
Japan	31,687	36,480	92,582	0.4721
Australia	26,087*	37,854	57,857	0.2967
New Zealand	23,767*	33,080	32,723	0.4090
Italy	35,138*	31,640	n.a.	0.7777
Portugal	7,577*	11,819	17,273	0.9813
South Korea	10,743	17,995	40,916	0.5866
Mexico	7,607*	12,900	25,931	2.0273
Malaysia	3,429	n.a.	12,661	n.a.
Thailand	2,705	4,912	19,946	n.a
Indonesia	1,008	n.a.	5,139	n.a
China	729*	n.a.	2,885	n.a

n.a. Note: n.a.: Not available *: Figures refer to 1995-99 **: West German figures only
***: Based on 1991 data Source: 1) Worldbank (2001) 2) Penn World Series (2002) 3) OECD (1998)

Table 4: South Korean FDIs in manufacturing by 2001 (total)

Region	Total Amount in US $1,000 (a)	Number of Project (b)	Amount per Investment [(a)/(b)] in US $1,000
Pacific Ocean and Oceania	89,352	108	827.3
North America	4,446,028	767	5,796.6
Asia	8,174,999	6,740	1,212.9
Africa	149,612	45	3,324.7
Europe	1,774,425	252	7,041.3
Central and South America	708,891	244	2,905.2
Middle East	38,743	17	2,279
Total	15,382,050	8,173	1,882.0

Source: Korea Export Import Bank (2001)

In addition, pondering that in the ratio of total operating surplus--*s*--over total compensation of employees--*v*--in manufacturing, the advanced countries such as U.S.A., Japan and Germany registered 0.27, 0.47 and 0.15 respectively, less than 0.5, but the developing countries like South Korea, Portugal and Mexico listed 0.58, 0.98 and 2.02 separately, higher than 0.5, we can agree that with *v* increasing, *s/v* falls. These all indicate the validity of our system, Fig. 1.

The pattern of South Korean FDIs: Table 4 shows the amount and number of foreign direct investments done by the South Korean manufacturing firms by May 2001 by region. We see that Asia surpasses others as hosting region for the South Korean FDIs. However, in amount of investment per project, Europe and North America do not allow any meaningful comparison. It seems definite that the South Korean MNCs have invested relatively more capital in developed than developing countries.
Table 5 shows what kinds of manufacturing the South Korean foreign subsidiaries have been engaged in by region. We find that in number of projects, in Asia, food and textiles has attracted the South Korean FDIs more than any other sector but in Europe and North America, telecommunications equipment has done more. Especially, in transportation equipment, including automobiles, the South Korean FDIs in Europe is really impressive.
Therefore, we can make sure that the South Korean subsidiaries in developed region--Europe and North America--have produced more capital-intensive and higher valued goods those in developing--Asia.

Effect of International Wage Gaps: The next question to answer is whether the South Korean MNCs have produced more-valued goods in developed countries than in South Korea, as we predicted with Fig. 1.
Table 6, based on a direct survey, shows how the South Korean consumer electronics MNCs organized their foreign production. We recognize that in Europe and North America, whose labor costs more, their subsidiaries were manufacturing higher than or same value-added goods as in South Korea but in South East Asia, whose workers are rewarded less, they produced lower value-added.

Table 5: South Korean FDIs in manufacturing by region by 2001 (total) unit: US$1,000

	Asia		Europe		North America	
	No.	Amount	No.	Amount	No.	Amount
Food	469	442,161	13	31,680	52	80,542
Textile and Clothing	1,506	1,438,368	33	19,517	133	146,581
Leather and Footwear	528	359,478	5	7,678	22	18,921
Wood and Furniture	287	143,109	4	16,221	14	59,576
Paper and Printing	162	171,485	5	47,059	29	68,046
Petroleum	617	764,782	23	100,240	69	432,241
Non-Metals	276	396,545	6	37,042	8	59,556
Basic Metals	175	326,028	7	14,894	25	754,641
Fabricated Metals	291	207,545	5	906	42	237,324
Machinery and Equipment	587	468,084	28	61,701	107	867,095
Telecommunications equipment	738	2,116,534	66	572,039	168	1,457,010
Transportation equipment	237	812,245	31	800,023	13	197,371
Others	867	528,635	26	65,425	85	67,124
Total	6,740	8,174,999	252	1,774,425	767	4,446,028

Source: Korea Export Import Bank (2001)

Table 6: Make up of the products of the South Korean foreign subsidiaries in consumer electronics industry unit: number of manufacturing affiliates

	Europe	North America	Southeast Asia	Total
Manufacturing higher than or same value-added products as the parents	7	2	0	9
Manufacturing lower value-added products than the parents	3	2	8	13
Total	10	4	8	22

Note: Data were compiled based on direct responses Source: Park *et al.* (1994) P72 Table III-7

Table 7: Make up of Thomson's worldwide production by region as of 1995

Locations	Hourly labor cost	Production	Workforce	Share of workforce	Share of sales
France	100	Headquarters, research, large screen TVs, components	5,400	10%	10%
Western Europe	60 ~ 120	Large screen TVs, components	7,200	13%	29%
America	45 ~ 90	US market	19,200	36%	56%
U.S.A.	6 ~ 12	US market			
Mexico					
Asia					
China	2	Radios, radio alarm-clocks	18,200	34%	3%
Malaysia	5	Radios, Radio alarm-clocks			
Singapore	22	Small TVs, VCRs			
Other					
Poland	11	Small TVs	4,000	7%	2%
Total			54,000	100%	100%

Source: OECD (1996) P217 Table 5

Table 7 reveals the way that Thomson, a representative French MNC in electronics, arranged its production in worldwide as of 1995. It suggests that the investment strategy to assign products internationally by labor cost is not specific to the South Korean firms but has been generally adopted by other MNCs. We see that Thomson undoubtedly made the factories in the high labor-cost regions like France and other Western Europe specialize in manufacturing high valued goods such as large screen TVs and developing new products but those in the low labor-cost like Asia produce low valued goods such as radios, small TVs, etc. It is also ascertained by the fact that Thomson's Asian subsidiaries employing 34% of its workforce contributed only 3% to the total global sales, while those in France, Western Europe and America did more with relatively fewer employees. However, Thomson differs from the South Korean MNCs in that it would not need to make higher valued products abroad than home, in good chance.

A Strategy Imposed from Outside: Then, we are left with a seemingly perplexing question why the South Korean MNCs have decided to manufacture high-end products in developed region. Having invested in other developing countries, which can be compared to the FDIs done by the Region A firms in Region B in <Figure 1>, they could have increased profits by saving labor cost, while the South Korean economic potential being remained intact. Table 8 shows how seriously the South Korean electronics MNCs have considered regionalism in investing internationally.

We see that the attempt to minimize trade friction and secure markets explains the motive of their FDIs to significant extent. Especially, that in South East Asia, the South Korean MNCs founded production facilities to save labor cost not to defuse trade friction underlines what would have happened if there had been no regionalism in developed region. In this context, their FDIs were forced upon them from outside, we can say.

However, unfortunately, regionalism does not seem to ebb away. Recently, announcing two final candidate sites for North American factories, Hyundai Motors did not try to hide that there is a political motive for the investment, that is, U.S. pressure on Korea to open its automobile market [*Joongang Il-bo*(Daily *Joongang*), Feb 27,2002]. We can expect that if reasonable, Hyundai Motors is going to produce high-valued automobiles in North America.

Implication on the South Korean Economy: Then, what will happen to the domestic economy if the South Korean MNCs continue to invest in developed region to produce higher valued goods than in South Korea. There is no other industry like semiconductor allowing us to forecast easily the long-term effect of this strategy. How important this industry is for the South Korean economy is needless to mention. It is not too much to say that the future South Korean economic prosperity depends on semiconductors heavily.

We see that the two largest South Korean semiconductor manufacturers, actually world first and third largest,--Samsung Electronics and Hynix Semiconductor--have maintained production facilities in Europe and North America. According to Hynix, it has produced 16% of the total DRAM--dynamic random access memory--wafer output and over 50%of the 64-megabyte DRAM chips in Eugene, Oregon, U.S.A. (Hynix Semiconductor Press Release, July 19, 2001). The problem is that although the company as well as the industry in general is undergoing financial difficulty, Hynix is planning to strengthen its foreign production. Even announcing the six-month temporary closure of the production subsidiary in Eugene, Hynix said that it would invest approximately US$150 million to upgrade its facility to a more advanced technology that would allow Hynix Semiconductor Manufacturing America to

Table 8: Motives for South Korean FDIs in consumer electronics by region

Motive	Europe	North America	South East Asia	Total
To reduce labor cost	1	2	8	11
To reduce trade friction	7	3	0	10
To develop or secure markets	9	3	4	16
To get advanced technology	0	1	0	1
To export to the other countries	2	1	4	7
Others	2	2	0	4

Source: Park *et al.* (1994) P67 Table III-2
Note: based on multiple responses from twenty-two South Korean overseas subsidiaries in consumer electronics

transition from producing 64-megabyte DRAM chips to 256-megabyte DRAM chips (Hynix Semiconductor Press Release, July 19, 2001). It means that if everything goes on as the company planned, its North American affiliate is going to produce the products valued as much as or more than those in South Korea. However, this inference is not strong enough yet to enable us to jump to the conclusion that the Hynix's FDI will hurt the South Korean economy. Before going further, it is necessary to check whether the future investment will work to transplant production capacity from South Korea to the United States or not. If the investment could increase and upgrade the semiconductor production in South Korea as well, we need not worry about the FDI very much.
On the other hand, what takes place in the current world economy appears to point to the other way round. Above all, it is not unfamiliar that in almost all industries, firms have encountered overcapacity and overproduction. About this Thurow argued before that there is no industry where people cannot find the capacity worldwide to produce at least 40 percent more product than anybody means they will want (Thurow 1988:61). According to the New York Times, the world is already glutted with manufactured goods and East Asia, including South Korea, has been responsible for it in recent years (November 16, 1997). The falling revenue and profit prove that semiconductor industry is not an exception (Financial Times, June 20, 2001). These all imply that Hynix' investment in North America is likely to substitute rather than complement the domestic production and that ultimately, it will weaken the South Korean international competitiveness in this industry.

Conclusion

We have established that in the present world economy where regionalism governs FDI flows, developing country MNCs, including South Korean, in capital-intensive industry, have no choice but to invest in developed region to produce higher valued goods than home because of worldwide wage gaps. It appears that LG Philips Display culminated this FDI strategy by setting up even its head office in the Netherlands. We inferred that these FDIs would but deprive the related developing economies of their growth potential. The concerned MNCs may gain by chance through such FDIs, but the economy is to suffer.
Krugman *et al.* (1995) shows how differently the workers have been affected internationally, in this situation. According to them, developed country workers are protected from wage declines only by suppressing incipient developing country industrialization, and thereby also keeping developing countries' real wages low (Krugman *et al.*, 1995). Put otherwise, practically, the low-paying developing country workers have supported financially their high-paying developed country counterparts through the FDIs done by developing country MNCs in developed region. Krugman *et al.* (1995) added that if the protectionist measures implemented by developed countries disappear and the integration between developed and developing economies proceeds further, the advantages of the former are eroded and the resulting rise in the latter's income may be partly at the former's expense (Krugman *et al.*, 1995). This argument clearly reveals who have been benefited by the current contradictory system and who will resist any attempt to change it.
Once, Emmanuel(1972) proved that when developing country trading with developed, part of value would be transferred from the former to the latter, owing to the international wage gap. Now, in "the era of free trade and investment", we are likely to witness not partial but entire value shift from developing to developed countries, because of regionalism in the latter, on top of it. In the process, the inequality between two camps will increase rather than decrease, opposing to our hope. The regionalism in developed economies is more threatening the world economic welfare than that in developing, and should be abolished first.

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