Effects of Outward Foreign Direct Investment on Home Country Exports: The Case of Korean Firms

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In this paper, empirical analysis has been conducted at the firm level in terms of foreign direct investment (FDI) directions, subsidiary ages, and industry's life cycle, to examine the relationship between a country's FDI activities and its exports, using the data of Korean firms. Empirical result supports that outward FDI would have a more positive effect on home country exports if the subsidiaries are located in less developed countries than in developed countries; if they are relatively new; if the industry is in a declining stage in the firm's home country.

INTRODUCTION

This paper examines the relationship between a country's foreign direct investment (FDI) activities and its export, i.e., substitutes or complements, focusing on multinational corporations' (MNCs') subsidiary types in terms of the location of subsidiaries, the duration of subsidiaries, and the industry's life cycle in the firm's home country.

The question of whether a firm should go abroad or not is very important to both policymakers and business people. Policymakers are often concerned about the possibility that trade deficits and the "industry hollowing" effect may be related to a domestic firm's outward FDI. However, from the firm's perspective, domestically oriented strategies may result in severe damage to the firm's international competitiveness. If the firm's business is positioned in a declining industry or faces trade protectionism that hinders its access to existing export markets, the firm will have difficulties to grow further and even to survive.

The approach in this paper leads to a wider scope of choices as a strategic means for policymakers and business people. In fact, according to subsidiary conditions, factors such as the location in developed or less developed countries, newly established or long-standing subsidiaries, and the declining or growing industry in the firm's home country, can make the differences in the relationship between FDI activities and its export.

In order to prove our argument we will review related theories, formulate hypotheses, and then conduct statistical analysis in cases such as the location of FDI, the duration of subsidiaries, and the business environment of parent firm.

LITERATURE REVIEW AND HYPOTHESES

How can we explain the relationship between MNC activities and trade? Home exports can either replace or promote MNCs' foreign production. To determine this relationship, researchers have empirically tested the effects of overseas production on home country exports. These studies have focused on two fundamental aspects of the effect of outward FDI on home exports — whether FDI substitutes or complements home country exports. Lipsey and Weiss (1981), Helpman (1984), Grossman and Helpman (1989), Lin (1995), and Pfaffermayr (1996) suggested that outward FDI had a positive effect on home exports. In contrast, Mundell (1975) and Svensson (1996) argued that in some cases FDI caused negative effect on exports. From a theoretical point of view there is no clear assertion concerning the relationship between FDI and net exports (Pfaffermayr, 1996), and the relationship is

essentially an empirical one (Lin, 1995). However we can logically infer that relationships will differ according to differences in subsidiaries' situations, such as location, duration and industry's life cycle.

We first argue that outward FDI is more effective on home country exports when the subsidiaries are in less developed countries (LDCs), as opposed to more developed countries (DCs). MNCs from DCs go abroad to exploit ownership advantage. This type of FDI has been addressed by many conventional FDI theorists from Hymer (1976), Buckley and Casson (1976), Rugman (1981) to Dunning (1988). In contrast, firms from less developed countries (LDCs), also invest in developed countries for strategic motivations such as market seeking, exploration (market proximity), learning, compensating for disadvantages (Moon and Roehl, 1993). We call the former as downward FDI and the latter as upward FDI in this paper.

We can expand these FDI theories to their effects on exports. It is possible that subsidiaries in LDCs cannot acquire all the intermediary goods needed through the local market that might not be well developed. Therefore, specific raw materials and intermediary goods are supplied from home or other DC markets to subsidiaries in host LDCs. For example, most Korean computer manufacturing subsidiaries in Southeast Asia and South America import their main components such as microchips, from their parent firms. They also have difficulty in acquiring equipment and machinery from the local market. In contrast, subsidiaries in DCs assemble sophisticated components in local market and export them to their parent firm. Lipsy and Weiss's research (1981) concurs with this. They examine the relationship between U.S. and foreign affiliate activity in markets (DCs and LDCs) and exports to that market by the U.S. and other foreign countries. The result is that activity of U.S. manufacturing affiliates in less-developed markets has a positive effect on U.S. exports.

The duration of a subsidiary's operation as well as the subsidiary's environments of location can make an impact on exports. In general, new subsidiaries need more capital goods, such as machinery for installation, at the initial stage than already established subsidiaries. Furthermore, with the passage of time, the subsidiary will use progressively more locally made components due to the local government's requirement for local market development. Bergsten et al. (1978) argued that, in the early stage of FDI, foreign subsidiaries are highly dependent upon exports of intermediate goods from the parent firm. However, as the local operations expand, dependency upon the parent firm decreases, thereby imports from the parent firm decrease.

The final factor that is relevant to our argument is the industry's life cycle. Several previous studies of the export effect on subsidiaries took into consideration their industry characteristics (Lipsey and Weiss, 1981; Andersson and Fredriksson, 1996). In Lipsey and Weiss's research, the estimation coefficients of export effect were significantly higher among metals and machinery groups than in other industries. Whereas, in Andersson and Fredriksson's research, only FDI associated with the textiles and clothing industries produced significantly positive results. Negative effects, on the other hand, were recorded in the paper and pulp, paper products, chemicals, and the iron and steel industry. (The impact in other industries, e.g., electronics, machinery and transport equipment industry, were not found to be statistically significant). However, the previous studies do not explain why the export effects on outward FDI are different across industries. We believe that exports to subsidiaries are influenced by the evolution of industry's life cycle rater than its individual industry type.

The export effect is more likely to be positive when the industry is in a declining stage in the firm's home country. In this case, a parent firm is willing to compensate for its loss of exports through outward FDI. The firm thus attempts to get additional returns on its old or obsolete equipment by exporting it to its foreign subsidiaries and produce its products using cheap resources purchased in the local market. For example, many Korean firms have transferred their obsolete and semi-automatic machinery to China, Vietnam or other LDCs and replaced them with new and fully automatic machinery in their home country. Old and semi-automatic machinery can be more effectively

utilized in China or Vietnam, because the availability of an abundant and inexpensive labor force in these countries can supplement the competitive shortcomings of such equipment. Furthermore, semi-automatic machinery that requires a relatively greater input of labor (labor-intensive machinery) would be more beneficial to the host country in the sense that it would help solve local unemployment problems and therefore be preferred by the local government. To summarize, this paper will test the following three hypotheses:

Hypothesis 1: Outward FDI has a more positive effect on home country exports if the subsidiaries are located in LDCs than in DCs.

Hypothesis 2: Outward FDI has a more positive effect on home country exports if the subsidiary is relatively new

rather than old.

Hypothesis 3: Outward FDI has a more positive effect on home country exports if the industry is in a declining stage than a growing stage in the firm's home country.

EMPIRICAL ANALYSIS

Data

The data on Korean MNCs were collected by the Korea Trade-Investment Promotion Agency (KOTRA) through its overseas network, and the Bank of Korea (BOK). The data set consists of 179 samples collected from 16 countries: eight countries in Asia, five in Europe, two in Latin America and one in the Commonwealth Independent States (CIS). Only manufacturing subsidiaries are included in the sample. Subsidiaries involved in service and R&D activities are not included.

Table 1. Summary of Variables and Subsidiary Types

Subsidiary Types and Variables	Contents
Types	
DOWNWARD	Subsidiaries located in less-developed countries (when compared to the home country)
UPWARD	Subsidiaries located in more developed countries (when compared to the home country)
YOUNG	Subsidiaries established for less than five years
OLD	Subsidiaries established for more than five years
TEX-CLO IND	Textile and clothing industries
E-E IND	Electrical and electronic industries
Dependent variables	
NETEXP	Net exports to subsidiaries, i.e., total exports to host country less imports from host country
CAPEXP	Value of capital equipment exported from parent firm to subsidiary
Independent variable	Value of outward FDI
OUTFDI	GDP differentials between home country and host country, i.e., host
GDPGAP	country's GDP subtracted from home country's
WAGEGAP	Wage differentials between home country and host country, i.e., host country's average hourly wage subtracted from home country's

Variables

Two dependent variables and three independent variables are used in the models. Dependent variables of net exports as Model 1 and capital goods as Model 2. All model specifications are estimated using the Ordinary Least Square (OLS) multiple regression model. Besides OUTFDI (FDI in host countries), GDPGAP (GDP differentials) and WAGEGAP (wage differentials) are added progressively to the model as control variables to determine how robust the results are to alternative specifications. For control variables, we would like to use the Kojima-Ozawa thesis. Kojima (1978) and Ozawa (1979) viewed American market-seeking FDI as anti-trade oriented, arguing that the basis for trade is eliminated by outflows of capital from the capital-exporting country's advantaged industry so FDI is a substitute for trade. On the other hand, Japanese resource-seeking FDI is trade oriented and designed to complement Japan's comparative advantage so FDI creates exports. To operationalize the Kojima-Ozawa thesis, we measured GDPGAP, by subtracting host country's GDP from home country's, for market-seeking FDI, and expected a negative relationship with NETEXP. For factor-seeking FDI, we measured WAGEGAP, by subtracting host country's wage from home country's, and expected a positive relationship with NETEXP. The types of FDI and variables are explained in Table 1.

In this paper, a subsidiary in operation for five years or more is classified as old, while a subsidiary in operation for less than five years is classified as young (refer to Table 2 for descriptive statistics of the sample). Although outward FDI from Korea first occurred in the late 1960s, such investment was largely restricted by the Korean government except for a few cases. However, in 1987, the Korean government liberalized regulations on outward FDI. When the balance of trade worsened in 1990, restrictions on outward FDI were again imposed and then relaxed again in 1992. Therefore, Korean outward FDI has a history of only about ten years beginning in 1987.

Table 2. Descriptive Statistics of Korean Subsidiaries: Age and Year of Establishment

Variables	Mean	Standard Deviation	Minimum	Maximum
Age	5.32	3.52	1.00	27.00

Two industries — textiles/clothing, and electrical/electronics, are selected to represent declining and growing industries, respectively. These two industries account for more than half of Korea's total exports. As shown in Table 3, the top exporters were the textile and clothing until 1987 and thereafter electrical and electronics. This trend shows that at the end of 1990s when this research was conducted, the textile and clothing were declining industries, and the electrical and electronics industries were growing industries.

Table 3. Changing Contributions of the Textile-Clothing and Electrical-Electronic Industries to Total Korean Exports, 1970-1997

Units: billion US dollars, (%)

Year	70	75	81	85	86	87	88	89	90	91	92	93	94	95	96	97
TEX -CLO	0.34 (40.8)	1.84 (36.2)	6.18 (29.5)	7.00 (23.1)	8.73 (25.2)	11.1 (23.5)	14.1 (23.3)	15.1 (24.3)	14.7 (22.6)	15.5 (21.5)	15.8 (20.5)	15.9 (19.3)	17.3 (18.0)	18.4 (14.7)	17.7 (13.6)	18.3 (13.4)
E-E	0.02 (3.5)	0.45 (8.9)	2.21 (10.6)	4.89 (16.2)	7.62 (21.9)	11.6 (24.6)	16.3 (26.8)	17.1 (27.4)	17.8 (27.4)	20.2 (28.0)	21.6 (28.2)	24.2 (29.5)	31.5 (32.8)	44.4 (35.5)	42.5 (32.8)	42.6 (31.3)

Source: *Foreign trade yearbook*, the Korea Foreign Trade Association, Seoul, Korea: KFTA, Various issues.

Note: TEX-CLO and E-E stand for "textile and clothing industry" and "electrical and electronic industry", respectively.

FINDINGS

The variance inflation factors (VIFs), which measure how much the variances of the estimated regression coefficients are inflated as compared to when the independent variables are not linearly related, are considerably lower than 10 (the highest VIFs is 3.51), This shows that the presence of multicollinearity is insignificant (Neter et al. 1985). Other methods of detecting the presence of multicollinearity also show that the problem of multicollinearity is not serious. Eigen values are not low (the lowest value is .23) and condition indices are not high enough (the highest value is 3.10).

The regression results generally support our hypotheses as shown in Table 4. For Hypothesis 1, the relationships between OUTFDI and dependent variables are positive and significant for all models in the case of DOWNWARD. In contrast, for UPWARD, the relationship between OUTFDI and dependent variables is insignificant. It supports the view that subsidiaries in LDCs have a more positive effect on the home country rather than in DCs, as set forth in hypothesis 1.

Regarding Hypothesis 2, for the YOUNG type of FDI, the relationship between OUTFDI and NETEXP is positive and significant, while it is not significant for the OLD type of FDI. In model 2, OUTFDI to CAPEXP is significant for both YOUNG and OLD type of FDI. However, the coefficients are more influential in YOUNG than in OLD. The value of the coefficient of OUTFDI to CAPEXP for the YOUNG type is more than three times the corresponding coefficient for the OLD type of FDI. The positive relationship between the dependent and independent variables for the OLD type of FDI can be explained by the possibility of reinstallation of factory equipment. Subsidiaries must eventually replace worn-out or out-of-date machinery that was installed initially.

Table 4. Regression Results

FDI types and Independent Variables	Model 1 NETEXP		Model 2 CAPEXP	
DOWNWARD				
Constant	11266.014	(1.804)	-341.703	(-.259)
OUTFDI	.639**	(3.101)	.162**	(6.414)
GDPGAP	18.799	(1.778)	-1.571	(-.804)
WAGEGAP	1662.876	(1.748)	-128.835	(-.645)
Adjusted R^2	.130		.302	
F-value	4.994		14.969	
UPWARD				
Constant	45055.003	(1.722)	4929.235	(1.586)
OUTFDI	.989	(1.480)	-3.41E-03	(-.047)
GDPGAP	-7.932	(-.317)	4.184	(1.286)
WAGEGAP	-3743.587	(-1.172)	-636.967*	(-2.225)
Adjusted R^2	.026		.083	
F-value	1.206		1.930	
YOUNG				
Constant	-1280.294	(-.170)	-625.276	(-.494)
OUTFDI	2.646**	(2.705)	.237**	(2.539)
GDPGAP	-5.577	(-.372)	5.274*	(2.425)
WAGEGAP	-74.649	(-.076)	-189.296	(-1.125)
Adjusted R^2	.089		.185	
F-value	2.964		6.687	
OLD				
Constant	12345.968**	(3.106)	90.609	(.101)
OUTFDI	.435	(1.425)	6.87E-02**	(3.677)
GDPGAP	-55.852	(-1.886)	1.257	(.561)
WAGEGAP	4201.756**	(2.973)	-117.023	(-.101)
Adjusted R^2	.305		.190	
F-value	7.149		5.135	
TEX-CLO IND				
Constant	3733.887	(.526)	-1374.076	(-.555)
OUTFDI	.523**	(3.631)	.464**	(6.488)
GDPGAP	21.040*	(2.050)	.118	(.030)
WAGEGAP	518.514	(.484)	-198.530	(-.541)
Adjusted R^2	-.252		.503	
F-value	5.278		15.495	
E-E IND				
Constant	21321.296	(1.391)	952.719	(.433)
OUTFDI	.836	(1.357)	4.29E-02	(.624)
GDPGAP	-5.077	(-.218)	6.461*	(2.104)
WAGEGAP	970.666	(.457)	-360.937	(-1.387)
Adjusted R^2	.003		.059	
F-value	.973		1.778	

Note: T-values are in parenthesis.
** and * indicate significance at the 1% and 5% levels, respectively.

Hypothesis 3 is also supported by the regression analysis. In Model 1, the relationship between OUTFDI and NETEXP is positive and significant for TEX-CLO IND (textile and clothing industry), while it is not significant for E-E IND (electrical and electronic industry) as expected. In Model 2, OUTFDI to CAPEXP is also significant for TEX-CLO IND and insignificant for E-E IND.

For the control variables, the Kojima-Ozawa hypothesis is not supported in this study, except for one case of WAGEGAP for established subsidiary in Model 1.

CONCLUSION

This paper has analyzed the relationship between exports and outward FDI from a firm's perspective. Most of the previous studies have focused more on the national level rather than on a firm-level analyses so different types of subsidiaries are not considered. In contrast, this paper focuses on MNCs' individual subsidiaries and outward FDI, which are examined in terms of the location of subsidiaries, the duration of subsidiaries, and industry's life cycle. Empirical tests show that outward FDI would have a more positive effect on home country exports if the subsidiaries are located in less developed countries, relatively new, and in a declining home industry than in developed countries, old, and a growing home industry, respectively.

This study can provide valuable lessons to both policymakers and business people. Policymakers often argue that outward FDI may negatively affect the trade balance of home country. However, this study shows that outward FDI can have positive effects on home country's exports under some conditions. In addition, policymakers are also concerned about the hollowing-out effect of outward FDI and consequently the deteriorating competitiveness of the home industry. However, they have to realize that firms can be competitive by going abroad in this globally competitive environment. The interests of policymakers and business people do not in fact conflict with each other if they look at the relationship between FDI and trade from firm's perspective rather than country's perspective.

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