

Does FDI Crowd Out Domestic Firms?

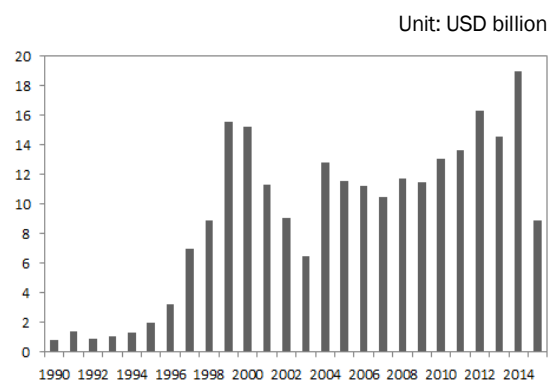
Micro-Level Evidence from the Republic of Korea

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I. Influx of FDI

The influx of FDI (foreign direct investment) to Korea began in the 1980's, and increased dramatically following the establishment of the 'Foreign Investment Promotion Act' in 1998. As barriers to the market entry for foreign firms are reduced and a variety of incentives such as cash grants and tax exemptions are provided to foreign firms, more foreign firms enter the domestic market. However, it declined in the early 2000s because of global economic slowdown due to events such as the 9-11 terrorist attack and Information Technology Bubble Decay, etc. Investments have rebounded since 2004 and attracted more than 10 billion dollars thereafter, reaching a peak of 19 billion dollars in 2014.

Figure 1. FDI Inflows into Korea



Source: Ministry of Trade, Industry, and Energy.

Most governments believe that FDI contributes to economic development by creating jobs and introducing advanced technology and management practices to the host country. Based on this belief, the Korean government also changed its restrictive strategy to actively attract foreign firms after the Asian financial crisis, by providing a variety of incentives for foreign firms. As a result, foreign firms now account for about 20 percent of total exports and 6 percent of employment, and have had significant impacts throughout the economy.

II. Crowding-out and Market-stealing Effect of FDI

2.1. Backgrounds

With highly increasing FDI, its positive role of transferring advanced technology and creating extra jobs has received much attention by policymakers and economists. Based on the belief that multinational firms bring benefits to the host country, governments provide a variety of incentives, such as tax holidays, import duty exemptions, subsidies, or preferential loans, to attract multinational firms to their country.

In contrast, some economists maintain that foreign firms have a market-stealing and crowding-out effect in the host country. For example, Aitken and Harrison (1999) presents that the entry of the foreign firms crowds out domestic firms from the domestic market, which causes their unit cost of production to increase, consequentially leading to a decrease in the productivity of domestic firms. Blomstrom, Kokko, and Zejen (2000) also argue that the crowding-out effect by multinational firms is more serious in developing countries than developed countries.

This report aims to empirically test which one of the contracting effects, knowledge spillovers and crowding-out effects dominate the other. Specifically, the following questions are addressed: does FDI force domestic firms to exit the market? In particular, does the crowding-out effect have a more serious impact on small firms than large firms? Does the presence of foreign firms draw sales from domestic firms, and is this in particular more severe in the case of small firms?

2.2. Data and Empirical Framework

To answer the questions, this report examines Korean firm-level data for the period of 2006 through 2013, covering 16,175 firms across 26 industries, provided by Statistics Korea. Table 1 lists 27 industries, and among them 26 industries except for the water facilities industry are used. In addition to the baseline estimations, since the impact of foreign firms on the survival and growth of domestic firms may appear to be different in manufacturing vs. service sectors and high-export vs. low-export groups because of their characteristics, structure of competition, or relationship with foreign firms etc., it conducts an empirical test for each group.

Table1. List of Industries

Industry Group	Industry
Agriculture-livestock-fisheries -mining industry	Agriculture-livestock-forestry
	Fisheries
	Mining
Manufacturing industry	Food Industry
	Textile-fabric-clothing
	Paper-wood
	Chemical
	Medicine
	Non-metallic minerals
	Metal
	Machine-equipment
	Electricity-electronics
	Transportation machine
	Other manufacturing
Service Industry	Distribution
	Restaurants-hotels
	Transportation-storage
	Communication
	Finance-insurance
	Real estate-lease
	Business service
	Culture-leisure
	Public-other services
Electricity-gas-water- construction industry	Electricity-gas
	Water facilities
	Construction
	Specialized Construction

Source: Statistics Korea

Among the firms in the dataset, 4,845 firms meet the definition of exit firms which existed in the previous year but do not any longer in the data, and this accounts for about 30 percent of total firms. Table 2 shows the exit rate, an average ratio of the number of exit firms in the total number of firms in each industry over the sample period. There is a large variation in exit rates, from 5.44 percent to 43.09 percent, with an average exit rate of 20.45 percent across industries.

Table 2. Exit Rate by Industry

Industry	Exit Rate
Agriculture-livestock-forestry	43.09
Fisheries	15.07
Mining	23.43
Food Industry	17.93
Textile-fabric-clothing	24.12
Paper-wood	17.87
Chemical	14.65
Medicine	10.09
Non-metallic minerals	21.35
Metal	16.94
Machine-equipment	17.12
Electricity-electronics	23.55
Transportation machine	15
Other manufacturing	23.18
Distribution	18.65
Restaurants-hotels	22.39
Transportation-storage	14.53
Communication	20.99
Finance-insurance	15.16
Real estate-lease	23.8
Business service	21.03
Culture-leisure	17.55
Public-other services	22.11
Electricity-gas	5.44
Water facilities	.
Construction	29.5
Specialized Construction	37.11

Source: Calculations by author based on firm-level data from Statistics Korea

To assess how foreign presence affects exit of domestic firms, I conduct the following estimation:

$$X_{ikt} = \beta_0 + \beta_1 IFDIG_{kt} + \beta_2 \log S_{ikt} + \beta_3 Size_{ikt} IFDIG_{kt} + \beta_4 \log KINT_{ikt} + \beta_5 INT_{ikt} + \beta_6 IG_{kt} + \beta_7 T_t + \beta_8 I_k + e_{ikt} \dots (1)$$

Here, X_{ikt} is a dummy variable with 1 if firm i in industry k exits market in year t and 0 otherwise, where exit is defined as the firm is recorded in the year t but no longer beyond year $t+1$ in the database. $IFDIG_{kt}$ denotes a growth rate of foreign investment in industry k between year $t-1$ and year t . S_{ikt} is a normalized size of the firm, which is created by ranking firms by the number of workers within industry and year and then dividing them by the total number of firms in the same industry and year. As a result, the size ranges from 0 to 1, with a value of 1 for the largest firms. In addition, in order to examine differential impacts of foreign firms on large and small domestic firms, I include interaction terms of the size of the firm and a growth rate of foreign investment of the industry to which the firm belongs. As control variables, I consider size, capital-labor ratio, and intangible asset ratio of the firm i in industry k in year t , and growth rate of sales in industry k in year t . Here, size of the firm is measured by the number of regular workers, capital-labor ratio by a ratio of total asset to the number of workers, intangible asset ratio by a ratio of intangible asset to total asset, and growth rate of the industry by an average rate of change in sales in the industry k between $t-1$ and t . In order to control for macro-level shocks such as inflation, business cycles, aggregate demand, or political reforms and unobserved characteristics of the industry such as industry structure or specific input requirements, I include time and industry fixed effects. Also, time and industry dummies help to avoid bias from endogeneity of IFDI be-

cause foreign investment may target more profitable industries or sharply increase in the certain year after some deregulation. Since the dependent variable is a dummy variable, I apply logit to test equation (1).

In addition to the first specification, I analyze whether domestic firms experience decrease in sales as more foreign firms dominate domestic market with the following equation:

$$\begin{aligned} \log Sales_{ikt} = & \beta_0 + \beta_1 IFDI_{kt} + \beta_2 \log S_{ikt} \\ & + \beta_3 Size_{ikt} IFDIG_{kt} \\ & + \beta_4 \log KINT_{ikt} + \beta_5 INT_{ikt} \\ & + \beta_6 IG_{kt} + \beta_7 T_t + \beta_8 I_k \\ & + e_{ikt} \dots (2) \end{aligned}$$

where $Sales_{ikt}$ indicates sales of the firm i in industry k in year t , $IFDI_{kt}$ is foreign direct investment in industry k in year t , and all other variables are the same as those defined previously.

2.3. Empirical Results

The main results, the impact of foreign firms on the survival and sales of domestic firms, are presented in Table 3. The result presents that foreign direct investment increases exit probability of the domestic firms. However, since both coefficients on the IFDIG and the interaction term are significant and the sum of the two terms is -0.001, it shows that small domestic firms experience the crowding-out effect while the exit probability of the large firms rather decreases with the foreign investment. That is, smaller firms are forced to exit the market as foreign firms pour into the domestic market, whereas larger firms rather benefit from the presence of the foreign firms.

Table 3. Exit and Growth of Sales of Domestic Firms

	Exit	Sales
IFDI	0.001*** (0.0003)	-0.305*** (0.010)
S	-0.079*** (0.002)	0.061*** (0.002)
IFDI*S	-0.002* (0.001)	0.005 (0.006)
KINT	-0.199*** (0.022)	0.441*** (0.015)
RD	0.036*** (0.010)	-0.004 (0.002)
IG	0.004 (0.028)	0.012*** (0.003)
Constant	1.859* (1.101)	8.248*** (0.258)
Industry Effects	Yes	Yes
Year Effects	Yes	Yes
Pseudo R-squared/ R-squared	0.100	0.421
Log likelihood	-8190	
Number of Observations	38,051	51,279

standard errors in parentheses

*** p<0.1, ** p<0.5, * p<0.1

Source: Calculation by author

In addition to the baseline estimations above, I divide the full sample into manufacturing and service sectors and examine how the crowding-out or spillover effects of the foreign firms are different in each sector. Table 4 summarizes that the results of the crowding-out effect is larger in the service sector. On the other hand, foreign firms draw demand from domestic firms in both sectors, and the market-stealing effect is larger in the manufacturing sector.

Table 4. Manufacturing vs. Service Sectors

	Exit		Sales	
	Manufacturing	Service	Manufacturing	Service
IFDI	0.001*** (0.0003)	0.058*** (0.010)	-0.323*** (0.016)	-0.261*** (0.014)
S	-0.115*** (0.005)	-0.067*** (0.003)	0.063*** (0.004)	0.052*** (0.003)
IFDI*S	-0.002 (0.001)	-0.054** (0.026)	0.007 (0.008)	0.005 (0.009)
KINT	-0.156*** (0.040)	-0.205*** (0.030)	0.517*** (0.017)	0.375*** (0.026)
RD	0.053*** (0.014)	0.022 (0.016)	-0.007** (0.003)	0.008* (0.005)
IG	0.068 (0.045)	-0.158*** (0.053)	0.002 (0.005)	0.008** (0.004)
Constant	4.187*** (0.921)	3.657*** (1.215)	7.695*** (0.189)	8.114*** (0.171)
Firm Effects	—	—	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes
Pseudo R-squared/ R-squared	0.121	0.101	0.506	0.310
Log likelihood	-4413	-3103	—	—
Number of Observations	21,524	14,528	29,032	19,529

standard errors in parentheses

*** p<0.1, ** p<0.5, * p<0.1

Source: Calculation by author

Lastly, I raise the question on whether the crowding-out effect of foreign firms is likely to be stronger or weaker in the high-export group, and examine the question by dividing the sample into low-export and high-export groups. The two groups are classified by the average export of the industry over the sample periods, so that the two groups have a similar number of observations. Table 5 shows whether foreign firms differently affect the exit and sales of the high-export firms and low-export firms. The first two columns correspond to the impact of the foreign firms on the exit of the two groups, and the last two columns are for sales in the two groups. It shows that exit pressure is larger for the high-export group and high-export firms lose more shares of the domestic market, as more foreign investment enters the domestic market. It may be that since foreign firms mostly compete with domestic exporting firms, high-export firms are more sensitive to the presence of foreign firms.

Table 5. Low-export vs. High-export Groups

	Exit		Sales	
	Low-export	High-export	Low-export	High-export
IFDI	0.001*** (0.0003)	0.135* (0.074)	-0.251*** (0.025)	-0.333*** (0.028)
S	-0.115*** (0.007)	-0.148*** (0.009)	0.048*** (0.006)	0.065*** (0.007)
IFDI*S	-0.002 (0.001)	0.222 (0.222)	0.019 (0.012)	-0.002 (0.015)
KINT	-0.189*** (0.060)	-0.141** (0.071)	0.404*** (0.024)	0.516*** (0.026)
RD	0.025 (0.023)	0.071*** (0.022)	-0.003 (0.004)	-0.006 (0.004)
IG	0.435*** (0.114)	0.058 (0.086)	-0.0008 (0.007)	0.011 (0.008)
Constant	2.036 (1.246)	8.167*** (0.700)	8.102*** (0.256)	7.726*** (0.168)
Firm Effects	—	—	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes
Pseudo R-squared/ R-squared	0.118	0.129	0.471	0.519
Log likelihood	-1629	-1808	—	—
Number of Observations	8,336	9,773	11,245	13,259

standard errors in parentheses

*** p<0.1, ** p<0.5, * p<0.1

Source: Calculation by author

III. Conclusion

This report analyzes the impact of foreign investment on the exit and sales of domestic firms, using 2006-2013 Korean firm-level data. The results show that the crowding-out and market-stealing effects are more severe for small firms. While foreign firms drive small domestic firms out of the domestic market and take away domestic market shares, large firms rather enjoy the spillover effects from foreign firms. The baseline estimation is further investigated by dividing the full sample into manufacturing vs. service sectors and low-export vs. high-export groups. The crowding-out effect related to exits is more severe in the service sector, while the market-stealing effect on domestic firms' sales is larger in the manufacturing sector. On the other hand, both of the crowding-out and market-stealing effect appear to be larger in high-export groups. To summarize, foreign firms have negative impacts, in particular, on small firms, whereas larger firms rather benefit from the positive externalities of foreign firms. It may be that large firms possess enough ability to compete with foreign firms, and also to learn and apply the advanced technology the foreign firms bring in. The result also shows that since domestic firms in the service sector tend to be small, their survival is vulnerable to the presence of foreign firms, whereas since market competition is more severe in the manufacturing sector, domestic firms' market share loss is more severe in the manufacturing sector. Lastly, we found that domestic exporting firms are in more intense competition with foreign firms.

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