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Araştırma Makalesi

THE DETERMINANTS OF INWARD AND OUTWARD FDI BEHAVIOR FOR ISE-LISTED FIRMS[1]

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Abstract

The aim of this paper is to examine whether or not the determinants of Foreign Direct Investment (FDI) differ in terms of inflows and outflows at firm level for publicly traded companies in Turkey just before witnessing 2008 global economic slowdown. A multinomial probit regression is used to analyze the determinants of inward, outward and both inward and outward FDI behavior of firms simultaneously. Findings suggest that the probability of a firm to engage in FDI activity increases with firm size, age and advertising intensity and decreases with liquidity. The higher the market share of FDI receivers in sectoral output, the more likely a firm will engage in FDI activity through spillover effects. Additionally, the probability to engage in outward FDI increases with financial constraints whereas the probability to receive inward FDI increases with profitability and decreases with capital intensity. The higher the R&D intensity, the more likely a firm is to engage in both types of FDI activity simultaneously. The results are mostly insensitive to manufacturing and non-manufacturing industry distinction.

Keywords: *FDI, Turkey, Multinomial Probit.*

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İMKB FİRMALARI İÇİN DOĞRUDAN YABANCI YATIRIM GİRİŞ VE ÇIKIŞ KARARININ BELİRLEYİCİLERİ[2]

Öz

Bu çalışmanın amacı, 2008 yılındaki küresel ekonomik durgunluğa tanıklık etmeden önce, doğrudan yabancı yatırımın (DYY) belirleyicilerinin, halka açık şirketlerde giriş ve çıkışlar açısından farklılık gösterip göstermediğini incelemektir. Çok terimli probit modeli, firmaların yabancı yatırımı yapma, yabancı sermayeli olma ve aynı anda hem yabancı sermayeli olma hem de yabancı yatırım yapma davranışlarının belirleyicilerini analiz etmek için kullanılmıştır. Bulgular, bir firmanın yabancı yatırım faaliyetinde bulunma ihtimalinin firma büyüklüğü, yaş ve reklam yoğunluğu ile birlikte arttığını ve likidite ile azaldığını göstermektedir. Sektörde doğrudan yatırımcıların pazar payları ne kadar yüksek olursa, dalgalanma etkisi yoluyla diğer firmalarında doğrudan yabancı yatırım yapma oranı o kadar yüksektir. Buna ek olarak, yabancı yatırım yapma olasılığı finansal kısıtlarla birlikte artarken, yabancı sermayeli olma ihtimali karlılıkla artmakta ve sermaye yoğunluğu ile azalmaktadır. Ar-Ge yoğunluğu ne kadar yüksek olursa, bir firmanın her iki tipteki doğrudan yabancı yatırım faaliyetine aynı anda katılma ihtimali de o kadar yüksek olur. Sonuçlar imalat sanayi ve imalat sanayi dışı firmalar için ayrım gözetmemektedir.

Anahtar Kelimeler: *Doğrudan Yabancı Yatırım, Türkiye, Çok Terimli Probit.*

INTRODUCTION

Foreign direct investment (FDI) by multinational firms has been argued as main source of economic growth for developing countries. The previous empirical studies confirm the positive impact of FDI on trade, employment and capital. Moreover, FDI has been viewed as a key channel for transferring knowledge, skills and technology, especially from industrialized to developing countries. These gains have conduced researchers to investigate empirically the factors that motivate FDI behavior. The key question about FDI activity is why a firm would choose a foreign market to operate through affiliate production rather than exporting or licensing arrangements (Blonigen, 2005). The standard answer revolves around country level factors like country's stage of development, infrastructure, cost structure, skill differences in human capital, network linkages, market size and growth, institutions and incentive policies and firm level factors like the presence of intangible assets inherent to the firm, such as technologies, marketing and managerial skills, etc.

The impact of FDI on economic growth can take place through increased productivity, profitability, human capital accumulation, R&D activity as well as technological and productivity spillovers (Blomström and Kokko, 1998). In

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addition, the impact of multinational firms on economic growth can be greater if the investment that the host country receives stimulate domestic investment activity. Having firm peculiar assets, such as production technology and know-how, marketing and management skills among others, foreign-affiliates of multinational firms are expected to be more productive and profitable than local plants (Taymaz and Yılmaz, 2009).

In order to examine the location decision choice of MNEs, *Dunning's eclectic (OLI) paradigm* provides a framework by combining the firm specific advantages and the host country location endowments. Dunning (2000) explains the internationalization of a firm's activities by ownership specific advantages (O) such as multinational experience and managerial skills, location specific advantages (L), and internalization specific advantages (I). In addition to OLI paradigm, Dunning (1993) analyzed different motivations and types of outward FDI based on four categories: market-seeking related to market size and growth; resources-seeking related to specific resources unique to foreign locations; strategic asset-seeking related to technological and marketing capabilities and global brand reputation; and efficiency-seeking related to cost structure.

Numerous factors influence the decision to engage in FDI activity including firm specific characteristics such as size, technological capabilities, managerial skills, country specific characteristics such as market structure, technological infrastructure, exchange rate effects, tax treatments, institutions and incentive policies and trade openness (for a review of these factors, see Blonigen, 2005). The relative role of these factors in determining inward and outward FDI activity is complex to assess and depends largely on firm intrinsic strategies. Previous studies investigate the relationship between decision made by firms to conduct FDI activity and firm size (Blomstrom and Lipsey, 1991; Dunning, 2000; Pradhan, 2004), profitability (Trevino and Grosse, 2002), export orientation (Lin, 2010; Pradhan 2004), age of firm (Pradhan, 2004), capital intensity (Siddharthan and Nollen, 2004), technological capabilities (Lall, 1980; Pradhan, 2004), managerial skill (Pradhan, 2004), advertising intensity (Blonigen, 2005) and financial constraints (Bond et al., 2003).

The value of FDI inflows to developing and economies in transition has been increasing at a much higher pace than FDI inflows going to developed countries (UNCTAD, 2007). The increasing attractiveness and success of the developing countries as investment locations in attracting FDI are likely to be associated with an investment environment characterized by growing markets and increasingly liberal policy frameworks. These global trends have also been observed at the country level in Turkey. A few mega cross-border mergers and acquisitions (M&As) and the privatization of financial services made Turkey the largest recipient in West Asia, with inflows of $20 billion in 2006 (UNCTAD, 2007: 18). Although Turkey has comparative advantage in geographic location, low labor cost, abundance of resources and applies FDI promotions and incentives

to stimulate investment environment recently, FDI inflows as well as outflows, are not at the preferred level. The level of FDI inflows increased in particular during 2005-2006 when the privatization efforts were intensified. However, this increase in the FDI inflows due to privatization could not be sustained in the long-run.

In 2008, the world economy has witnessed a severe financial crisis leading to major declines in output, employment and trade (Alfaro and Chen, 2012). Moreover, the market value of assets of many parent firms and their affiliates all over the world fell down as the global financial crisis in the last quarter of 2008 began to hit. Reported upward trend of FDI over the preceding years has been reversed in the second half of the year and continued in 2009 (UNCTAD, 2009). The global economic downturn caught up with Turkey as well and adversely affected FDI inflows.

Although FDI inflows into West Asia increased in 2008, representing a 16% increase, the growth of FDI inflows to Turkey was negative. In Turkey, the second largest recipient in the region, FDI inflows declined by 17% to $18 billion, after reaching a remarkably high level in 2007 due to a number of cross-border M&A settlements in the financial industry (UNCTAD, 2009:57). Among the main recipient countries, the United Arab Emirates and Turkey were hit the hardest in 2009, with declines of 71% and 58%, respectively. The cross-border M&A sales in Turkey decreased sharply from $13.2 billion to $2.8 billion (UNCTAD, 2010:44). The deterioration was registered in all manufacturing and service sectors except electricity and gas, where two privatization deals in Turkey initiated acquisitions. In addition to inflows, Turkey's outward FDI increased especially after 2005, having a peak in 2008 reaching to $2.5 billion but declining later on up to 2012 (UNCTAD, 2012).

In this respect, empirical studies focusing on the determinants of inward FDI stock provided evidence on the derivers that motivate MNEs to engage in FDI in Turkey by means of location-specific motives like agglomeration and coastal access (Deichmann et al., 2003), political and economic risk (Erdilek, 2003; Erdal and Tatoglu, 2002), human capital (Deichmann et al., 2003), market size (Erdal and Tatoglu, 2002; Karagöz, 2007), infrastructure (Karagöz, 2007), market attractiveness and growth (Tatoglu and Glaister, 1998). However, there is a huge gap in the literature on the determinants of outward FDI stock from Turkey (for a similar conclusion, see Kaya, 2005). Among these few studies that analyzes the determinants of outward FDI, most rely on macro-level reasoning to account for the FDI flows (Kayam and Hisarcıklılar, 2009; Kok and Ersoy, 2009; Yaprak and Karademir, 2011; Aybar, 2016). Moreover, some studies investigate the entry mode and location choice determinants of Turkish firms' outward direct investments through questionnaires conducted and/or factor analysis (Kaya and Erden, 2008; Anıl et al., 2011; Kaya, 2014; Gubbi and Sular, 2015; Uray et al., 2015). The macro-level studies examine the determinants of outward FDI by bilateral trade, economic stability, productivity, gross domestic product per capita

for both the source and destination countries, the distance between them and population and find that Turkish outward investments are mainly market oriented. Firm-level studies for investigating location choice determinants of Turkish outward FDI emphasize the importance of acquiring an international brand for global presence, taking the advantage of growing markets and focusing on marketing-related factors. To the best of authors' knowledge, yet there has been no study analyzing the determinants of FDI receivers and suppliers and both simultaneously at firm level.

The aim of this paper is to examine whether or not the determinants of FDI behavior differ in terms of conducting inward and outward FDI at firm level. We examine the different motives of FDI receivers and suppliers and both by using non-financial firms listed on Istanbul Stock Exchange (ISE) for the period of 1998-2008. The determinants of being a FDI receiving and/or supplying firm are investigated using firm specific factors like size, age, market perceived performance, profitability, liquidity, tangibility, export orientation, R&D intensity and advertising intensity, and sector specific characteristics like the market share of inward and outward FDI firms. A multinomial probit regression that takes into account possible multiple alternatives under the choice of engaging in FDI activity, confirms that the determinants of being FDI receiving and supplying firm differs in certain factors. Findings suggest that the probability of a firm to engage in FDI activity increases with firm size, age and advertising intensity and decreases with liquidity. Additionally, the probability to engage in outward FDI increases with financial constraints whereas the probability to receive inward FDI increases with profitability and decreases with capital intensity. Different than inward and outward FDI behavior of firm, indigenous technological capability increases the probability of a firm to undertake both types of FDI activity simultaneously.

The most important contribution of this paper is to investigate the determinants of inward and outward FDI behavior of firms using a panel data set providing additional information about different firms' features. Another contribution of this paper is to take a first step towards filling a gap on the determinants of engaging in both inward and outward FDI activity simultaneously at firm level for publicly traded firms in Turkey. Moreover, as the perceptions of the market environmental opportunities, host country locational attractiveness and firm specific capabilities to invest abroad influenced by financial crisis[3], we think that analyzing the decision to undertake FDI in emerging economies just before

[3] The empirical literature on the linkage between FDI and financial crisis of mainly dwells upon country level studies analyzing the impact of Asian financial crisis and 2008-2009 crisis on FDI flows to and from East Asian countries (Athukorala, 2003; Fan and Dickie, 2000; Park et al., 2006), from developing countries (Sauvant et al., 2010; Ucal et al., 2010; Poulsen and Hufbauer, 2011; Hill and Jongwanich, 2009), from emerging economies (Hui and Shang-Jin, 2009) and from Central and Eastern European countries (Dornean et al., 2012; Alfaro and Chen, 2010).

witnessing a global economic slowdown will imply different prospects for both inward and outward investment.

The paper consists of four sections. After the Introduction, section two presents the data sources and provides a descriptive analysis on FDI conducting firms by inward and outward activity and by different industries. Section three presents the findings of an econometric analysis, modeling the determinants of inward and outward FDI behavior of firms for manufacturing and non-manufacturing industry. The last section of the paper summarizes main findings and discusses policy implications.

DATA SOURCES

There are two basic data sources used in this study. The corporate-level accounting and performance information was from the ISE Financial Statements. It is an electronic database that provides information on the corporate performance and other financial indicators of all ISE listed firms. Additionally, data on the international activities of firm, its location and age is collected from ISE Company Yearbook providing information on to supplement the information from ISE Financial Statements.

The information on inward FDI activity of firms was collected from Financial Statement Footnotes showing the ownership structure of each firm. The FDI outward activity was collected from associate (in which the company has significant control) and subsidiary (majority-owned) information provided in Financial Statement Footnotes as well. In this study, firms are grouped into four categories regarding their FDI activity. The first group, "*non-FDI firms*", includes firms with no FDI activity. The second group, "*FDI receiving firms*", includes FDI receiving firms as joint ventures where foreign ownership is 10% or more and the third group, "*outward FDI conducting firms*", is the firms that engage in outward FDI activity. The last group, "*FDI in both*", brings in both FDI receiving and supplying firms.

Table 1: Number of non-financial firms listed at ISE (1998-2008)

	All	Non-FDI firms	FDI receiving firms	Outward FDI conducting firms	FDI in both
1998	196	122	30	37	6
1999	205	128	30	38	8
2000	217	134	28	43	11
2001	219	128	29	50	10
2002	216	125	28	50	11
2003	144	97	15	26	6
2004	218	123	28	55	12
2005	229	129	33	56	11
2006	223	123	31	53	15
2007	220	113	32	55	19
2008	214	110	30	53	19

Source: Authors' own calculation from ISE Financial Statements.

Table 1 presents the data on the number of firms in the database presented for four categories of firms that are defined according to their FDI activity for the period of 1998-2008. The non-FDI firms constitute the majority of firms that are publicly traded in ISE (close to 60%). The share of firms conducting outward FDI activity increased from 19% to 25% in 2008. On the other hand, the share of FDI receiving firms remained unchanged (14%) over the period, except for 2003 that has decreased to 10%. Although the number of firms engaging in both inward and outward FDI activity is small (only %5), the share of firms conducting both types of FDI activity continued to increase from 3% in 1998 to 9% in 2008.

Table 2 presents the data on the number of firms in the database for different categories of firms that are defined according to their FDI activity by manufacturing and non-manufacturing industry. The manufacturing firms constitute 79% of ISE listed firms. However, the share of manufacturing firms traded in ISE decreased from 84% to 77% in the sample period. The share of firms conducting FDI activity (43%) is smaller compared to non-FDI firms in manufacturing industry. However, the share of firms engaging in FDI activity increased from 38% in 1998 to 48% in 2008. The share of outward FDI conducting firms (23%) is higher than FDI receiving firms through all years. The share of firms engaging in both inward and outward FDI activity has increased from 2% to 10 % in 2009 in manufacturing industry. When we look at non-manufacturing industry, the share of firms conducting FDI activity (37%) is smaller compared to non-FDI firms. Moreover, the share of firms engaging in FDI activity has slightly increased to 5% in 2008. The share of outward FDI conducting firms (20%) is twice the share of FDI receiving firms through all years. The share of firms receiving and supplying FDI remained unchanged for the period 1998-2008 and the share of firms conducting both inward and outward FDI activity in non-manufacturing industry is rather small (0.08%).

Table 2: Number of non-financial firms listed at ISE for manufacturing and non-manufacturing industry (1998-2008)

	Manufacturing industry				
	All	**Non-FDI firms**	**FDI receiving firms**	**Outward FDI conducting firms**	**FDI in both**
1998	164	101	26	32	4
1999	168	102	26	33	6
2000	174	103	24	38	8
2001	175	98	26	42	7
2002	172	95	26	42	7
2003	115	78	14	20	3
2004	171	94	25	45	7
2005	175	97	27	44	7
2006	170	93	25	40	11
2007	168	86	25	41	15
2008	164	85	23	40	14

	Non-manufacturing industry				
	All	**Non-FDI firms**	**FDI receiving firms**	**Outward FDI conducting firms**	**FDI in both**
1998	32	21	4	5	2
1999	37	26	4	5	2
2000	43	31	4	5	3
2001	44	30	3	8	3
2002	44	30	2	8	4
2003	29	19	1	6	3
2004	47	29	3	10	5
2005	54	32	6	12	4
2006	53	30	6	13	4
2007	52	27	7	14	4
2008	50	25	7	13	5

Note: Non-manufacturing industry excludes financial sector.

Source: Authors' own calculation from ISE Financial Statements.

When we look at the share of FDI receiving and outward FDI conducting firms, there are significant differences between manufacturing and non-manufacturing industry. Although the share of outward FDI conducting firms is higher compared to FDI receiving firms in both types of sectors, the share of FDI receiving manufacturing firms constitutes 86% of the total FDI receivers. The share of outward FDI conducting manufacturing firms is 81% of total firms that conduct outward FDI activity. It is interesting to observe that although the share of FDI receiving manufacturing firms decreases in the sample period, this share for non-manufacturing firms increased from 13% in 1998 to 23% in 2008. A similar outcome is also valid for the share of outward FDI conducting non-manufacturing firms. However, for the period 1998-2008, the share of manufacturing firms conducting both inward and outward FDI activity (68%) is higher than their counterparts in non-manufacturing sector. Thus, although the share of receiving and conducting outward FDI firms is increasing at a higher rate in non-manufacturing industry, the firms that conduct both inward and outward FDI

activity mainly operate in manufacturing industry.

THE DETERMINANTS OF INWARD AND OUTWARD BEHAVIOR OF ISE-LISTED FIRMS

In this paper we analyze the role of firm and sector specific characteristics to explain the determinants of FDI activity in the mode of different types. In the empirical literature, the studies evaluating the determinants of FDI activity (measured as a binary variable for firms indicating whether they engage in FDI activity or not) utilize the binary choice analysis. As dependent variable of engaging in FDI takes binary values 0 or 1, the probit (logit) model that links the probability of this outcome taking the value of one if the firm engages in FDI activity and the value of zero in the opposite case to the normal (logistic) distribution is used (Greene, 1997:874). The determinants of two different types of conducting FDI activity, inward and outward FDI, in opposite to not conducting FDI has been tested with one of the binary choice models (e.g. probit, logit) separately in the previous empirical studies. Moreover, the FDI activity status of a firm may change from not FDI conducting to FDI receiving, to outward FDI conducting and lastly to both receiving and conducting outward FDI. Given this structure of our dataset, the firm in order to decide on engaging in FDI activity, chooses among possibly multiple alternatives. This type of choice models under multiple alternatives is called *m-choice multinomial models* and a typical representation of the random utility model is,

$$U_{ij} = b'X_{ij} + a'Z_{ij} + e_{ij} \quad j = 1,...,J, i = 1,...,n.$$

where X_{it} denotes individual firm characteristic and we consider firm i in choice situation, choosing among a possibly variable number of choices, J_{it} (for a detailed specification of the model, see Dow and Endersby, 2004; Keane, 1992). Thus, in any choice situation, the firm will make a choice under utility maximization that yields the highest utility, that choice, J_{it}, will be such that

$$P_{ij} = P\left[U_{i1} > U_{i2}, U_{i1} > U_{i3}, ..., U_{i1} > U_{im}\right] \quad \text{for all m } m = 1,..., J \text{ and } m \neq j_i.$$

Different assumptions about the distributions of the error terms ε lead to different discrete choice models like the multinomial logit and the multinomial probit model. The multinomial logit model has errors that are independently and identically distributed according to the type-1 extreme-value distribution. It presumes the independence from unrelated alternatives and the ratio of choice probabilities between alternatives is independent from any other alternative. The multinomial probit model assumes the errors are distributed multivariate normal,

with mean 0 and covariance matrix Σ, which in turn enables the errors to be correlated (Dow and Endersby, 2004).

The previous empirical studies showed that there are substantial differences between determinants of FDI receiving and outward FDI conducting firms. Moreover, these determinants may also change for manufacturing and non-manufacturing industry. We will analyze the determinants of FDI activity in ISE listed firms by using multinomial probit estimation method to understand if firm specific characteristics like size, age, market perceived performance, profitability, liquidity, tangibility, export orientation, R&D intensity and advertising intensity, and sector specific characteristics like the market share matter for different FDI conducting motives.

The first explanatory variable included in the FDI determinants model is the "*size*" variable that is measured by the (log) value of total assets. FDI activity usually undertaken by large firms since they have greater ability to overcome the risk and uncertainty associated with investing abroad. If large firms are more likely to conduct FDI than smaller firms through advantages of large resource base and economies of scale, easy access to market information and preferential access to capital markets, the coefficient of the size variable is expected to be positive. The (log) "*age*" of a firm is likely to influence its decision to engage in inward and/or outward FDI activity. The stock of intangible assets, like experience, managerial ability and technological skills are expected to grow with age. Therefore, older and established firms may have a higher tendency to conduct FDI than younger and inexperienced firms.

There are numerous theoretical and empirical studies that suggest that FDI activities are related with the performance measures like profitability, liquidity and financial position of firm. The resource-based view of FDI argues that a firm's distinctive resources and capabilities are the way to generate and maintain a competitive advantage and hence the profitability has a positive impact on a firm's engagement towards FDI. We use "*profit margin*" calculated as the ratio of gross profit over net sales to test if this expectation is also valid for ISE listed firms. Similarly, perceived stock market performance measure, "*market-to-book*" that is calculated by the ratio of market value over book value of the equity, is included in the model to check its effect on the determinants of FDI behavior as a signal of growth performance. In order to control access to finance and possible financial constraints, affecting firm's decision to receive and/or conduct outward FDI, firm's "*leverage*" in terms of total debt over total assets and firm's liquidity, "*current ratio*" calculated as the ratio of current assets over current liabilities, are included in the model. The investment projects abroad are mainly characterized by non-recoverable and high sunk costs and a significant uncertainty about the outcomes. Consequently, firms that encounter with remarkable financing constraints may have some disadvantages in investing abroad.

The empirical evidence demonstrates a strong and positive relationship between R&D investment and FDI activity at both the industry and firm levels. We use the "*R&D intensity*" variable, calculated as the ratio of R&D investment expenditures to net sales, to test the effect of indigenous technological capabilities on firm's decision to engage in FDI activity. If FDI conducting firms need to develop their own technology in order to be competitive in international markets, this variable will have a positive coefficient.

The decision to engage in FDI activity may also be affected from product differentiation advantages. In the literature, the relationship between FDI activity and product differentiation, proxied by "*advertising intensity*" as the ratio of the sales expenses over net sales, are mixed. Although the relationship between brand-building activities and investing abroad is well established in developed countries, FDI conducting firms from developed countries may have advantages over specific marketing and advertising skills (Pradhan, 2004). The FDI decision of a firm will be affected by the fact that whether or not the firm is required to undertake a notable amount of fixed investment in the host country as well. In other words, capital intensity is appropriate in determining the FDI behavior of firm because the size of the resources needed to engage in FDI can alter substantially between less capital-intensive and more capital-intensive firms. We included "*capital intensity*" that is proxied by the ratio of fixed assets to total assets in order to test the effect of capital intensity on FDI decision.

The last firm-level variable is "*export intensity*" that is measured by the ratio of export sales to net sales. As exporting yields further information on global markets, consumer preferences, size and progress of the targeted market, legal and institutional framework, firms with higher export intensity are likely to have higher propensity to undertake FDI activity if there are internationalization and location specific advantages in doing so.

In addition to firm specific variables, Model 2 includes two sector specific variables. These are the market share of FDI receivers and the market share of FDI suppliers in sectoral[4] output. These two variables are used to check if sectoral presence of FDI receivers and suppliers stimulates other firms to engage in FDI activity through knowledge spillovers or by competitive pressures.

Descriptive statistics for the variables used in the econometric analysis are presented in Table 3. The data are presented for all firms, non-FDI firms, FDI receiving firms, outward FDI conducting firms and firms conducting both types of FDI separately. Descriptive statistics including the mean values for the period 1998-2008 indicate that market-to-book, size, age, leverage, R&D intensity, advertising intensity, profitability, the market share of FDI receiving and outward FDI conducting firms are higher for firms engaging in FDI activity compared to firms with no FDI activity. However, current ratio, measuring the liquidity

[4] Sector is defined at the ISIC (revision 2) 2-digit level.

constraint, is lower for firms engaging in FDI activity. The differences between FDI conducting firms and non-FDI firms are more pronounced for firms engaging in both inward and outward FDI activity.

Table 3: Descriptive Statistics, mean values for the period 1998–2008

	All	Non FDI firms	FDI receiving firms	Outward FDI conducting firms	FDI in both
Market-to-book	2,188	1,936	2,851	2,086	3,388
Size	18,13	17,63	18,40	18,94	19,50
Age	3,289	3,205	3,411	3,416	3,380
Profit margin	0,069	0,063	0,097	0,059	0,097
Current ratio	2,117	2,364	1,849	1,761	1,718
Leverage	0,583	0,580	0,557	0,600	0,606
R&D intensity	0,005	0,004	0,004	0,009	0,009
Export intensity	0,260	0,258	0,213	0,288	0,294
Advertising intensity	0,075	0,062	0,092	0,093	0,096
Capital intensity	0,459	0,467	0,432	0,480	0,375
Market share of inward FDI	0,196	0,165	0,275	0,192	0,343
Market share of outward FDI	0,461	0,444	0,500	0,471	0,504
Number of observations	2301	1332	314	516	128

Source: Authors' own calculation from ISE Financial Statements.

Table 4 presents correlations between explanatory variables. "Inward FDI" dummy taking the value 1 if firm receives inward FDI, is positively correlated with size, age, R&D intensity, export intensity, advertising intensity and market share of inward FDI conducting firms and negatively correlated with current ratio indicating liquidity constraints. "Outward FDI" dummy taking the value 1 if firm conducts outward FDI activity, is positively correlated with market-to-book, size, age, advertising intensity, market share of FDI receiving firms and the market share of outward FDI conducting firms, and negatively correlated with export intensity, current ratio.

Table 4: Correlation Table

	Market-to-book	Size	Age	Profit margin	Current ratio	Leverage	R&D intensity	Export intensity	Advertising intensity	Capital intensity	Market share of inward FDI	Market share of outward FDI	Inward FDI
Market-to-book													
Size	-0,059 *												
Age	0,004	0,241 *											
Profit margin	0,048 *	0,056 *	0,025										
Current ratio	-0,039	-0,048 *	-0,044 *	0,025									
Leverage	0,019	-0,116 *	-0,021	-0,213 *	-0,254 *								
R&D intensity	0,028	-0,021	0,051 *	-0,091 *	0,027	-0,024							
Export intensity	-0,028	0,046 *	0,068 *	0,035	-0,081 *	0,052 *	-0,067 *						
Advertising intensity	0,073 *	0,022	0,108 *	-0,130 *	-0,047 *	0,054 *	0,176 *	-0,073 *					
Capital intensity	-0,113 *	0,158 *	0,078 *	-0,276 *	0,015	-0,045 *	0,048 *	-0,139 *	-0,086 *				
Market share of inward FDI	0,035	0,116 *	0,004	0,010	0,054 *	-0,006	0,123 *	-0,065 *	0,139 *	-0,111 *			
Market share of outward FDI	-0,109 *	0,205 *	0,110 *	-0,131 *	0,082 *	-0,026	-0,036	0,125 *	0,050 *	0,083 *	0,200 *		
Inward FDI	0,031	0,350 *	0,135 *	-0,009	-0,061 *	0,026	0,076 *	0,067 *	0,164 *	-0,003	0,079 *	0,038	
Outward FDI	0,125 *	0,177 *	0,101 *	0,105 *	-0,040	-0,013	-0,002	-0,044 *	0,130 *	-0,099 *	0,236 *	0,075 *	0,009

Source: Authors' own calculation from ISE Financial Statements.

Table 5: Determinants of inward and outward FDI (1998–2008)
Multinomial probit estmation results: All Firms

	FDI receiving firms				Outward FDI conducting firms				FDI in both			
	Model 1		Model 2		Model 1		Model 2		Model 1		Model 2	
Market-to-book	0,057	***	0,056	***	0,023		0,011		0,074	***	0,071	**
	(0.014)		(0.015)		(0.015)		(0.016)		(0.017)		(0.017)	
Size	0,286	***	0,241	***	0,456	***	0,475	***	0,613	***	0,570	***
	(0.036)		(0.038)		(0.033)		(0.035)		(0.048)		(0.050)	
Age	0,480	***	0,463	***	0,281	**	0,317	**	0,225		0,218	
	(0.113)		(0.115)		(0.104)		(0.107)		(0.154)		(0.160)	
Profit margin	1,996	***	2,219	***	0,673		0,617		1,284	**	1,540	**
	(0.458)		(0.472)		(0.429)		(0.437)		(0.638)		(0.662)	
Current ratio	-0,116	**	-0,117	**	-0,115	**	-0,108	**	-0,150	**	-0,158	**
	(0.041)		(0.039)		(0.037)		(0.037)		(0.069)		(0.073)	
Leverage	0,034		-0,012		0,245	**	0,251	**	0,203		0,154	
	(0.150)		(0.147)		(0.122)		(0.123)		(0.208)		(0.203)	
R&D intensity	-0,007		-3,396		2,297		2,037		8,121	**	5,585	*
	(3.218)		(3.599)		(2.442)		(2.475)		(2.879)		(3.078)	
Export intensity	-0,703	***	-0,625	**	-0,158		-0,024		0,084		0,290	
	(0.212)		(0.223)		(0.192)		(0.199)		(0.276)		(0.295)	
Advertising intensity	5,021	***	5,072	***	5,390	***	5,924	***	4,660	***	4,655	***
	(0.778)		(0.807)		(0.736)		(0.751)		(1.027)		(1.071)	
Capital intensity	-0,564	**	-0,514	*	-0,168		-0,220		-1,998	***	-1,628	***
	(0.278)		(0.289)		(0.251)		(0.260)		(0.385)		(0.402)	
Market share of inward FDI			1,857		***		0,083				1,958	***
			(0.282)				(0.279)				(0.355)	
Market share of outward FDI			0,335				-0,312				-0,150	
			(0.224)				(0.205)				(0.294)	
Constant	-7,868	***	-7,594	***	-10,361	***	-10,784	***	-13,437	***	-13,184	***
	(0.711)		(0.729)		(0.663)		(0.687)		(1.029)		(1.049)	
N. of observations	1925		1904									
Wald chi(2)	448,83	***	508,18		***							
Log likelihood	-1820,46		-1740,51									

Note: Standard errors in parentheses.

(***), (**) and (*) means statistically significant at the 1%, 5% and 10% level.

Estimation results for three types of FDI activity are presented in Table 5. Panel A constitutes the determinants of FDI activity for the whole sample. The probability of a firm to receive inward FDI increases with higher market-to-book, size, age, profitability and advertising intensity. It seems that older and experienced firms that are profitable and have product differentiation and brand-name

advantages have a higher propensity to attract FDI. On the other hand, higher export intensity, capital intensity and current ratio decrease the probability of a firm to receive inward FDI. The probability to receive FDI decreases if firms have liquidity constraints and higher tangibility indicating the need for high fixed investment in the host country. Export orientation has a negative and significant impact on the probability of being a FDI receiver firm. When sector specific variables are included in the model (Model 2), the coefficient estimates for all variables remained the same. The market share of FDI receivers in sectoral output has a positive impact on the probability of a firm to receive inward FDI. If the market share of FDI receivers increases, other firms tend to receive more inward FDI through spillover effects and possible competitive pressures exerted.

The probability of a firm to conduct outward FDI activity increases with size, age, leverage and advertising intensity and decreases with current ratio. This indicates that FDI outflow decision is influenced more by financial constraints whereas receiving FDI inflow is influenced more by profitability and market performance. Moreover, the market shares of FDI receiving and outward FDI conducting firms do not have any statistically significant effect on the probability of engaging in outward FDI.

The results for both FDI receivers and suppliers group are similar to FDI receivers with the exception of age, export intensity and R&D intensity. The coefficient of age variable is positive but insignificant whereas, the coefficient of export intensity becomes positive and insignificant. The probability of a firm to be both receiver and supplier of FDI increases with R&D intensity. Results indicate that, initial technological effort measured as R&D intensity increases the probability of firms to conduct FDI activity. Moreover, the probability to engage in both type of FDI activity increases with higher market share of FDI receiving firms in the sectoral output.

In order to check the effects of industry differences, the same models are estimated for manufacturing and non-manufacturing industries separately and the results are provided in Table 5. The results for manufacturing firms are similar to all firms with the exception of R&D intensity for firms receiving FDI inflow. It seems that older and experienced manufacturing firms that are profitable and have product differentiation and brand-name advantages have a higher propensity to attract FDI. On the other hand, higher export intensity, capital intensity and current ratio decrease the probability of a firm to receive FDI in manufacturing sector. Moreover, the probability of a firm to receive FDI inflow increases with higher R&D intensity, indicating the importance of technological capabilities in manufacturing industry.

The probability of a firm to conduct outward FDI increases with higher profit margin in addition to previous significant variables in manufacturing industry. This result also indicates that manufacturing firms with more accumulated profit will be able to support market expansion through FDI better.

Manufacturing firms have lower propensity to conduct outward FDI where the market share of FDI suppliers in sectoral output is high. The results for both FDI receivers and suppliers show that the probability of FDI activity increases with market-to-book, size, leverage and advertising intensity and decreases with liquidity constraints and tangibility in manufacturing industry. Additionally, the probability to receive and conduct FDI simultaneously increases with the high market share of FDI receivers in sectoral output and decreases with the market share of FDI suppliers in sectoral output.

The results for non-manufacturing industry, presented in Table 5, show that the probability of FDI receiving increases with size, age, profitability and advertising intensity, whereas decreases with export intensity. Moreover, the higher the market share of FDI receivers in sectoral output, the more likely a firm will receive FDI inflow. The probability of a firm to engage in outward FDI increases with size and age in non-manufacturing industry. This result indicates that larger and established non-manufacturing firms tend to have a higher probability to invest abroad.

When we include the market share of FDI suppliers and receivers in sectoral output to the model, advertising intensity has a positive and significant coefficient. However, compared to the results of all firms in the sample and manufacturing firms, the probability of conducting outward FDI decreases with leverage and profitability in non-manufacturing firms. The results for both FDI receivers and suppliers in non-manufacturing industry show that the probability of FDI activity increases with market-to-book, size and advertising intensity and decreases with current ratio, leverage and capital intensity. Additionally, both sector specific variables increase the probability of non-manufacturing firms to engage in both types of FDI activity. Thus, the higher the market share of FDI receivers and suppliers in sectoral output, the more likely a firm will engage in FDI activity through spillover effects.

Table 5 cont.: Determinants of inward and outward FDI (1998–2008) Multinomial probit estimation results, Manufacturing Firms

	FDI receiving firms				Outward FDI conducting firms				FDI in both			
	Model 1		**Model 2**		**Model 1**		**Model 2**		**Model 1**		**Model 2**	
Market-to-book	0,069	***	0,066	***	0,010		0,007		0,093	***	0,088	***
	(0.018)		(0.018)		(0.021)		(0.021)		(0.021)		(0.021)	
Size	0,289	***	0,233	***	0,477	***	0,532	***	0,622	***	0,596	***
	(0.043)		(0.045)		(0.041)		(0.044)		(0.059)		(0.062)	
Age	0,380	**	0,414	**	0,260	*	0,235	*	0,299		0,305	
	(0.144)		(0.145)		(0.138)		(0.139)		(0.227)		(0.229)	
Profit margin	1,274	**	1,349	**	1,617	***	1,418	**	1,039		0,844	
	(0.543)		(0.567)		(0.527)		(0.539)		(0.811)		(0.839)	
Current ratio	-0,115	**	-0,107	**	-0,229	***	-0,227	***	-0,200	**	-0,183	**
	(0.044)		(0.043)		(0.048)		(0.049)		(0.084)		(0.084)	
Leverage	-0,032		-0,064		0,230	*	0,261	**	0,335	*	0,284	
	(0.158)		(0.154)		(0.130)		(0.130)		(0.200)		(0.201)	
R&D intensity	3,498	***	2,813	**	-2,862		-0,521		-1,053		-1,293	
	(0.117)		(0.102)		(11.65)		(11.52)		(1.790)		(1.921)	
Export intensity	-0,808	***	-0,712	**	-0,152		-0,137		0,024		0,194	
	(0.241)		(0.250)		(0.221)		(0.226)		(0.342)		(0.354)	
Advertising intensity	5,381	***	5,267	***	6,824	***	6,995	***	5,965	***	5,861	***
	(0.902)		(0.922)		(0.868)		(0.875)		(1.178)		(1.200)	
Capital intensity	-0,603	*	-0,393		-0,139		-0,133		-1,141	**	-0,863	*
	(0.341)		(0.344)		(0.312)		(0.317)		(0.474)		(0.483)	
Market share of inward FDI			1,774		***		-0,407				1,602	**
			(0.341)				(0.346)				(0.462)	
Market share of outward FDI			0,009				-0,683	**			-0,660	*
			(0.282)				(0.263)				(0.386)	
Constant	-7,541	***	-7,144	***	-10,640	***	-11,172	***	-14,308	***	-13,997	***
	(0.821)		(0.832)		(0.794)		(0.815)		(1.278)		(1.307)	
N. of observations	1561		1561									
Wald chi(2)	371,82	***	421,29		***							
Log likelihood	-1452,02		-1420,49									

Note: Standard errors in parentheses.

(***), (**) and (*) means statistically significant at the 1%, 5% and 10% level.

Table 5 cont.: Determinants of inward and outward FDI (1998–2008) Multinomial probit estimation results, Non-manufacturing Firms

	FDI receiving firms				Outward FDI conducting firms				FDI in both			
	Model 1		Model 2		Model 1		Model 2		Model 1		Model 2	
Market-to-book	0,009		-0,001		0,035		0,012		0,094	**	0,103	**
	(0.035)		(0.037)		(0.026)		(0.029)		(0.014)		(0.051)	
Size	0,330	***	0,418	***	0,503	***	0,678	***	0,920	***	1,395	***
	(0.088)		(0.103)		(0.074)		(0.096)		(0.137)		(0.283)	
Age	0,637	**	0,616	**	0,415	**	0,471	*	0,312		0,113	
	(0.275)		(0.294)		(0.237)		(0.263)		(0.330)		(0.502)	
Profit margin	5,832	***	6,076	***	-1,607		-2,569	**	0,943		-0,721	
	(1.235)		(1.324)		(1.010)		(1.156)		(1.448)		(2.084)	
Current ratio	-0,183		-0,204		-0,009		-0,023		-0,509	**	-0,602	
	(0.170)		(0.176)		(0.029)		(0.036)		(0.204)		(0.392)	
Leverage	0,131		-0,419		-0,594		-1,336	*	-4,741	***	-5,642	**
	(0.820)		(0.857)		(0.562)		(0.649)		(1.107)		(1.885)	
R&D intensity	-6,440		-5,769		1,209		-2,428		8,574	*	10,24	
	(5.423)		(4.596)		(3.017)		(3.278)		(4.346)		(6.746)	
Export intensity	-1,837	**	-1,258		0,180		0,550		1,566	*	3,541	**
	(0.813)		(0.857)		(0.648)		(0.769)		(0.866)		(1.343)	
Advertising intensity	4,561	**	6,252	**	2,135		4,981	**	5,159	**	1,697	
	(1.844)		(2.032)		(1.640)		(1.829)		(2.507)		(3.984)	
Capital intensity	-0,550		-0,724		-0,220		-0,705		-6,703	***	-7,633	***
	(0.624)		(0.722)		(0.456)		(0.547)		(1.123)		(1.816)	
Market share of inward FDI			2,334	***			1,320	**			4,590	***
			(0.661)				(0.578)				(0.961)	
Market share of outward FDI			0,626				0,643				1,526	*
			(0.479)				(0.396)				(0.829)	
Constant	-9,221	***	-11,219	***	-11,055	***	-14,555	***	-14,962	***	-24,409	***
	(1.881)		(2.174)		(1.435)		(1.875)		(2.512)		(4.832)	
N. of observations	364		343									
Wald chi(2)	126,23	***	128,11	***								
Log likelihood	-299,36		-237,71									

Note: Standard errors in parentheses.

(***), (**) and (*) means statistically significant at the 1%, 5% and 10% level.

CONCLUSION AND DISCUSSION

Foreign direct investment by multinational firms has been accepted as source of technology diffusion and economic growth for developing countries. There are studies in the literature evaluating the factors that motivate MNEs to undertake FDI in Turkey by means of location-specific and transaction-related motives. However, firm level determinants of inward and outward FDI behavior has not been investigated thoroughly in literature. This paper investigates whether

or not the determinants of FDI receiving and outward FDI conducting differ at firm level for publicly traded companies in Turkey. Findings suggest that the probability of a firm to engage in FDI activity increases with firm size, age and advertising intensity and decreases with liquidity. The higher the market share of FDI receivers in sectoral output, the more likely a firm will engage in FDI activity through spillover effects. Additionally, the probability to engage in outward FDI increases with financial constraints whereas the probability to receive FDI increases with profitability and decreases with capital intensity. The higher the R&D intensity, the more likely a firm is to engage in both types of FDI activity simultaneously. The results are mostly insensitive to manufacturing and non-manufacturing industry distinction. These findings are in line with Uğurlu (2016) and Kaya and Erden (2008) affirming that FDI is more likely for firms that have high exports, are larger in size, R&D intensive and efficient in terms of asset utilization.

Our analysis on the determinants of inward and outward FDI behavior of firms provides a number of policy-relevant findings. There is strong evidence indicating that profitable firms are more likely to receive FDI and firms facing with liquidity constraints choose to conduct outward FDI activity. These findings altogether show that firms in developing countries face with financial obstacles for conducting investment abroad and the public support could play a critical role in helping them to overcome these obstacles. Another important finding of the paper is that indigenous technological capability of firm has positive impact on the probability of a firm to receive FDI and conduct outward FDI simultaneously. It is thus not surprising to find that technological capability has a stronger FDI stimulating effect especially on manufacturing firms that receive FDI inflows and on non-manufacturing firms that engage in both types of FDI activity. Moreover, if the market share of FDI receiving firms increase, other firms tend to engage in FDI activity proportionally more. Thus, sectoral spillover effects exert competitive pressures for ISE listed firms that receive and conduct FDI. Our empirical findings provide strong support for public policies that are essential to raise technological capabilities and competitive advantage of firms that face with financial obstacles in engaging FDI activities, especially in developing countries like Turkey.

The relative importance of the motives and determinants mentioned in the literature indicate differences between firms and regions and occasionally in particular to business cycles. The previous empirical literature on the relationship between financial crisis and FDI argued that increasing uncertainty in macro-economic performance due to financial crisis has a discouraging impact on FDI (Ucal et al., 2010). In other words, the financial crisis and economic turmoil affect future investment plans of firms through credit crunch and lead them to be more cautious about increasing their capacity and investing abroad. That is why the strategic behavior of investing firms in emerging markets has much to offer in terms of improving our knowledge of FDI in an era of changing global patterns (Gubbi and Sular, 2015).

Analyzing the changing nature of FDI for an emerging economy in relation with the impact of global financial crisis makes it further challenging to evaluate the decision to undertake FDI. The previous literature states that just before a global financial crisis, FDI inflows are likely to be more resistant than other forms of capital inflows, such as portfolio investment, bank lending and foreign capital (Hill and Jongwanich, 2009: 16). The picture is less clear in the case of outward FDI. Because the outflows undertaken are usually small before the crisis, the data has to be interpreted carefully. Outflow FDI undertaken by emerging economies may be motivated by greater risk taking in less developed commercial and regulatory environments, acquaintance with more labor-intensive and less scale-intensive technologies, a greater capacity to operate in environments that are less secure in formal sense (Hill and Jongwanich, 2009: 5). Moreover, our findings indicate that strategic asset-seeking motive seems to play an important role for ISE-listed firms' decision to invest abroad. As size, advertising intensity, financial constraints and market share of outward FDI significantly determine the decision to undertake outward FDI, Turkish publicly traded firms seeks to protect their export markets and gain new markets, increase their efficiency of export activities, access to neighboring-country markets through networks and sustain their brand reputation. As outward FDI reveals a country's changing economic structure and its international commercial engagement, further studies should be carried out in order to evaluate how and why geographical preferences of the Turkish MNEs differ.

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