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The Effect of European Accession Prospects on Foreign Direct Investment Flows

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Abstract

The amount of FDI is increasing than any other international transactions during the last two decades. While countries remove barriers and implement policies to attract FDI inflows, the volume of foreign trade and investment increased .The objective of this paper is to enlighten the impact of EU accession of CEEC countries and Turkey on FDI flows into these countries. We perform Arrenalo-Bond - GMM model for the period of 1990-2009 for Poland, Hungary, Czech Republic, Estonia, Slovakia, Romania, Bulgaria, Turkey Croatia, Macedonia, and Ukraine. The empirical results suggest that as agglomeration effects and trade openness are significant determinants of MNCs' activity during the period, traditional determinants, risk factors, labor cost, and market size are insignificant. In addition, the effect of EU accession prospects is found to be positive and significant.

Key Words: European Union; FDI; Turkey; Accession; Candidacy;

JEL Classification: F23

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1. Introduction

Multinational investment is one of the striking features of the global economy. Multinational enterprise (MNE) activity has increased at a faster rate than any other international transaction in last two decade. Foreign direct investment (FDI) can be defined as capital flows resulting from the activities of these enterprises. In fact, Central and Eastern European Countries (CEECs) have been receiving large amount of FDI inflows during the last 20 years, covering the process of transition from socialism to capitalism. FDI activity has facilitated the integration of these countries to the world economy. Moreover, multinational investment has positive implications over economic growth, technical innovation, enterprise restructuring for the host countries (Campos&Kinoshita, 2003).

Effective corporate governance and enterprise restructuring are important factors for CEEC countries aiming to accelerate transition processes. According to Barrel and Pain (1999) high levels of R&D expenditure, innovation, and company performance exist in multinational enterprises. In addition, FDI is important for CEECs because it serves as to deviate from their communist policies adopted before the transition period. In particular, FDI can be considered as a tool which provides the introduction of new managerial and technological techniques to these countries (Barrel&Holland, 2000). However, FDI inflows are highly dispersed across CEEC countries. If we look at FDI inflows for the last 20 years, the largest recipients are Hungary, Poland, and Czech Republic. The unequal distribution of FDI inflows shows that determinants of FDI are different across the transition countries. For instance, after Hungary and Poland began to implement liberal economic policies in 1989, FDI inflows increased by large amounts compared to other countries in the region. However, the determinants of FDI

in Czech Republic are mainly originated from favorable initial conditions such higher GDP per capita, well-educated population, and well-developed infrastructure. Moreover, many of the Commonwealth Independent States(CIS) such as Russia and Ukraine has been attracting multinational investment due to it abundance of natural resources such as oil and gas in that country.

Large amount of FDI flows into CEECs is also driven by the process of their integration to the European Union (EU). In fact, good performance of countries during the accession process to EU signifies abolishment of the barriers of all forms of international economic activity including FDI and acceleration of the transition process. The accessing countries have to harmonize their various aspects of political, economic, environmental considerations according to EU regulations to conform EU regulations, thus speed up the accession process, and maximize the benefits from EU instruments, such as regional development funds. Therefore, investment preferences of multinational companies (MNCs) are positively driven by EU accession phases of these countries. In particular political announcements concerning timetables for admission to the EU affects FDI inflows positively and significantly. Specially, establishment of regional corporate networks originated from prospective membership attract efficiency–seeking FDI, whose motivation depends on the common governance of geographically dispersed activities with the advantage of economies of scale and scope and risk diversification (Campos&Kinoshita, 2003)

These trends have originated a substantial interest in the international economic literature to empirically investigate the motives of FDI flows into CEEC countries. However, empirical investigations mainly concentrated on the traditional FDI determinants, such as market size, labor cost, and risk considerations, of CEECs. Moreover, Turkey has not been included to the

empirical panel analyses of CEECs and CIS in the economic literature. Our aim is to analyze empirically determinants of FDI inflows into CEECs and Turkey by focusing on the European Union accession prospects of these countries. We figure out this effect by testing the announcement effects on FDI flows into CEECs by using panel data on FDI flows into 11 transition countries (Poland, Hungary, Czech Republic, Estonia, Slovakia, Romania, Bulgaria, Croatia, Turkey, Macedonia, and Ukraine) for the period of 1990-2009. Following the literature, we include proxy variables to our model for FDI determinants; agglomeration economies, market size, labor cost, risk factors, and degree of trade liberalization and EU accession prospects.

2. Literature Review

Empirical literature of FDI determinants mainly focus on attraction factors, locational factors because the MNCs performing FDI are difficult to determine unless a large panel data set obtained. Generally, push-factors are difficult to identify because of the non-availability of data of firms involving in multinational investments. The traditional explanatory variables used in econometric analyses are market size, GNP growth, labor cost, exchange rate, and the degree of trade openness. In addition, the recent literature takes into account transition-specific factors such as agglomeration, economic stability, the degree of trade openness and some other institutional factors.

In particular, the relation between FDI and economic growth attract special attention in the empirical studies. In fact, economic growth attracts foreign investment because it is one of main positive macroeconomic indicators and indicates new marketing opportunities. On the other hand, the increase in FDI also stimulates economic growth because it adds the existing capital stock in the host country. In particular, Greenfield investment projects directly

contribute the capital stock in the host country. From this perspective, FDI activity and economic growth affect each other simultaneously. Therefore, there is an endogeneity problem between FDI and economic growth. Various econometric techniques, such as 2-stage least squares and Generalized Methods of Moments (GMM) have been used in the empirical literature of FDI determinants.

In addition FDI determinants differ whether both foreign and host countries are developing or only host country is developing. In the former case, Dunning (2002) states that the main motivation is strategic asset seeking. In this case, horizontal efficiency takes place. On the other hand, if firms involve in multinational investments for mergers and acquitions, vertical efficiency is the main motivation. That is, FDI is made to acquire new markets and resources.

According to Campos&Kinoshita(2002) human capital is one of the most important factors concerning FDI attraction. The labor that the foreign company employed should have adequate skills, experience and education to use the technology that the MNC transfers. The economic growth can be achieved in this way. One of the empirical studies confirms this hypothesis is Borenztein, De Gregorio and Lee (1998). In their study, the effect of FDI on economic growth is statistically only if they include the interaction term between FDI and human capital in their model. However, Campos&Kinoshita(2002) performed the model developed by Borenztein, De Gregorio and Lee (1998) for 25 transition countries in Europe and they found that FDI is independent from the level of human capital in these countries. In fact, the technology levels of these countries were exceeding threshold level at the beginning of the transition. When they perform regressions with both interaction term and without interaction term, they found statistical significance of FDI. Therefore, FDI does not necessarily depend on the minimum threshold level for transition economies. In addition, the

insignificant coefficients of human capital in the models performed in their paper imply that the effect of human capital on economic growth is less than expected.

Campos and Kinoshita(2003) try to answer how important are institutions and the agglomeration effect in comparison to other factors in host countries regarding the attraction of FDI. They tried to differentiate traditional (e.g., market size and labor cost), newer (e.g., institutions), and transition- specific determining factors(e.g., initial conditions). Using a panel data set covering 25 transition countries (the CEECs and the CIS) between 1990 and 1998, they found the effects of institutions, agglomeration, and trade openness are significant on FDI inflows. Firstly, they perform fixed effect and GMM models for pool of 25 transition countries. They found agglomeration effect statistically significant whereas market size is found to be insignificant. Therefore, market seeking motives may not be robust in these countries. Also, significant effect of trade openness imply that trade openness and FDI are complementary. The effect of education is found to be insignificant. One of the possible explanation for this result is that FDI mainly does not flow in to technologically sophisticated sectors, in which high quality of human capital is needed.

Secondly, the authors perform models for CEECs and CIS countries separately. They found that natural resources and infrastructure are the main determinants for CIS countries whereas agglomeration matters for the Eastern European and Baltic countries. Also, proximity to host country is found to be statistically significant for both groups of countries. Finally, restriction on FDI has is negative and significant effect, implying capital controls for direct investment inhibit FDI.

In summary, market size, labor cost, availability of natural resources, and proximity to major western markets are main determinants of FDI inflows. Thus, FDI would be directed to countries whose initial conditions are favorable. However, empirical research signifies other factors would be important.

Janicki and Wunnova (2004) examined determinants of FDI into eight central and eastern European countries, announced for accession into European Union. They performed a cross-sectional model for 1997 for these countries. The countries used in the model consist of Bulgaria, Czech Republic, Estonia, Hungary, Poland, Romania, Slovak Republic and Slovenia. The empirical results suggest that size of the host economy, host country risk, labor cost in the host country, and openness to trade have significant effects on FDI flows into these countries.

Bevan and Estrin(2004) analyzed determinants of FDI inflows into 11 transition countries, including Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia, and Ukraine, during 1994-2000 period. The authors exclude Russia, much of the CIS countries and countries from former Yugoslavia because it argued that these countries constitute special cases requiring country specific explanations. The explanatory variables they used in their model are GDP of the host country, unit labor cost in the host country, interest rate differential between source and host countries, distance between capital cities of host country and source country, the openness of the host economy, risk index, and a dummy variable reflecting positive announcements about prospective EU membership of the host country. In addition, the authors consider FDI reacts to these explanatory variables with a lag because it would take some time for occurrence of FDI flows as a response to explanatory effects. Therefore, they estimate two models, with both

contemporaneous form and with one-year lag for the independent variables. They estimate regression equations with random effects model. The significant effects that they found are unit labor cost, host and source country size, and proximity. Country risk is an insignificant determinant, implying that the risk of default is usually considered by portfolio investors or currency speculators. The effect of interest rate is insignificant, indicating that foreign investors prefer to use their own financial resources or capital markets in their own countries. Trade is found significant only for the lagged specification, indicating the FDI decisions focus on the information of trade activity in the past. In addition, the effect the EU accession prospects is found to be positive and significant, showing that FDI flows into transition countries, whose accession prospects are enhanced, increase even after controlling proximity and labor cost. The overall fit is better in the lagged specification, implying that the current FDI flows take into account past information rather than contemporaneous information.

Carstensen and Toubal (2004) examine determinants of FDI into CEECs by using dynamic panel GMM estimation technique within the framework of dynamic panel data. The model includes both traditional determinants such as, market size, labor cost, relative endowments, and transition-specific factors such as the level and method of privatization and country risk. Here, level of privitasition is used as a proxy for the quality of corporate governance. They found that both traditional explanatory variables and transition-specific factor have significant effects on FDI. They include corporate tax rates and relative endowments of the host country an explanatory variables in the model and found that these variables also have statistical significance in terms explaining FDI activity in CEECs. Education is found to be significant implying that MNCs prefer labor force that can easily adapt to innovative production technologies and Western Business culture. Moreover they imply that FDI and trade are complementary originated from the negative impact of trade cost on FDI.

Nunnenkamp and Spats (2002) modeled FDI determinants for 28 developing countries for the period 1987-2000. They found significant correlations between FDI flows and GNP per capita, risk, years of education, openness to foreign trade complementary production factors such as local raw materials, administrative obstacles, and cost factors such as taxation. Population, GNP growth, firm entry restrictions and technological infrastructure is insignificant to attract FDI. However, if the model includes only for non-traditional factors as explanatory variables, that is when traditional factors such as population and per capita growth are controlled, the variable representing cost factors is found to be statistically significant.

Holland et al. (2000) studied the determinants of FDI for Eastern and Central Europe and analyzed the importance of market size and economic growth. Tsai (1994) used simultaneous equation system to examine the endogenity between FDI and economic growth for decades 1970 and 1980. In this study, FDI was measured both as a flow and as a stock. The results of the study show that market size is more important than economic growth to attract FDI. Also, trade surplus is negatively statistically significant for FDI. Nominal wage has a positive effect and is statistically significant. In contrary, the effect of FDI on economic growth is unclear.

Garibaldi et al. (2001) used dynamic panel model for 26 transition countries for 1990-1999 period. The variables that they used are macroeconomic factors, structural reforms, instutional and legal frameworks, initial conditions and risk factor. They found that market size, budget deficit, inflation, exchange rate, risk factors, economic reforms, trade openness, bottlenecks in the bureaucracy are statistically significant in the expected direction.

Loree and Guisinger (1995) analyzed FDI made by United States for 1977-1982 period. The sample involves both developing and developed countries. One of the major findings is that variable concerning host country policy is significant if infrastructure is significant determinant in all regions.

3. Methodology

We will employ dynamic panel data approach by using generalized method of moments (GMM) [1]technique developed by Arellano and Bond(1991) to get empirical results of the determinants of FDI flows into CEECs and Turkey. The model is also known as autoregressive-distributed lag model (ARDL). In fact, many of the studies concerning determinants of FDI use static models such as Nonnemverg and Mendoca(2001). However, the issue should be analyzed in the context of dynamic structure of FDI. We will get more efficient and unbiased results from the Arellano and Bond estimation results by stressing the dynamic nature of FDI.

Using panel data in dynamic econometric models provides important advantages over the time-series and cross-sectional. Firstly, cross-sectional data by alone can not be used in dynamic models because dynamic relationship to be investigated can not be estimated from observations at a single point of time. In addition, we may get unbiased results originated from aggregation biases by using aggregate time-series data for just one cross-section. Using panel data prevents time-series aggregation biases and it provides the analyses of heterogeneity in adjustment dynamics between different types of cross-sections (Bond, 2002). Several alternative dynamic model estimators for panel data have been developed in the econometric literature such as 2SLS and GMM.

[1] We do not prefer to use dynamic cointegration model to clarify the long-run determianats od FDI because this technique requires a large time dimension. Moreover, transition-specific factors, such as the effects of EU accession prospects, can not be used in the dynamic cointegration method.

Dynamic models have been using in a wide range of economic literature such as Euler equations for household consumption, adjustment cost models for firms' factor demands and empirical models for economic growth. Although, the effect of the lagged dependent variable is not of concern, imposing dynamic process into the model enables more consistent and reliable estimates for the effect of other explanatory variables in the model.

We will follow partial stock adjustment model developed by Cheng and Kwan (2000) in which they estimate the role of past FDI values as a process of partial stock adjustment. The adjustment process is formulated as follows:

$$y_{it} = (1-\alpha) y_{i,t-1} + \alpha\, y_{it}^{*} \quad ; \quad \alpha < 1 \qquad (3.1)$$

where y_{it} *is* FDI stock in region I at time t and y_{it}^{*} is the equilibrium level of FDI stock. Here, we assume that it takes time for FDI to adjust to its equilibrium level. ($\alpha < 1$) is a condition that enables the question to be stable (non-explosive) and non-fluctuating. We need to determine the determinants of y_{it}^{*} to estimate equation 3.1. α is the coefficient of partial adjustment. It means that net investment in one year is α percent of the difference between y and y*. More specially, for instance, if it equals 20, it will take five years that the current FDI stock to adjust its desired or equilibrium level (Cheng and Kwan, 2000).

Based on partial stock adjustment model, the ARDL model, including one cross-section dimension, i.e. 11 host countries *i* with i = 1,....,*N* and one time dimension t with t = 2,….,T, we will estimate

$$y_{it} = \alpha y_{i,t-1} + \beta x_{it} + (\eta_i + \upsilon_{it}) \; ; \; i = 1,2,\ldots..,N; \; t = 2, 3\ldots., T \qquad (3.2)$$

where y_{it} is the net FDI inflow to county i at year t, $y_{i,t-1}$ is the net FDI inflows in the previous period(one-year lagged) , x_{it} is the vector of all explanatory variables that affect

FDI, η_i contains country-specific time-invariant effects which allows for heterogeneity in the means of y_{it} series across cross-sections, and υ_{it} is a serially-uncorrelated disturbance term.

Several techniques exist for the estimation of equation (3.2). Here, the estimator of ordinary least squares (OLS) of α would give inconsistent results, i.e., the estimates may not be close to the true value of the regression coefficients even the sample size gets larger, because of the positive correlation between $y_{i,t-1}$ and $(\eta_i + v_{it})$. Therefore, the estimate of α and β is biased upward. The inconsistency is originated from the presence of individual effects and can not be eliminated even thought the sample gets larger (Bond, 2002).

Within group estimator would remove the inconsistency because it changes the equation to eliminate η_i. This estimation technique requires the deviations of y_{it}, $y_{i,t-1}$, x_{it}, η_i and υ_{it} from their means. Because the mean of η_i is itself η_i, the individual effects are eliminated from the transformed regression. However, this technique would give inconsistent results too because of the negative correlation between lagged independent variable and transformed error term. Therefore, within group estimate of α and β is biased downward.

Two Stage Least Squres (2SLS) is another estimator for ARDL models. It is one of standard IV regression models, which include problematic an endogenous explanatory variables correlated with the error term, additional regressors that are not correlated with the error term, called exogenous variables, and instrumental variables correlated with the endogenous explanatory variables, but uncorrelated with the error term. 2SLS is different from OLS estimator in such a way that it uses Maximum likelihood estimators. We perform first – differencing transformation of equation (3.2) for 2SLS estimator:

$$\Delta y_{it} = \alpha \Delta y_{it-1} + \beta \Delta x_{it} + \Delta \upsilon_{it} \quad ; \quad i = 1,2,\ldots..,N;\ t = 3, 4\ldots.,T \qquad (3.3)$$

Where $\Delta y_{it} = y_{it} - y_{it-1}$. Here, $\Delta y_{i,t-1}$ and $\Delta \upsilon_{it}$ are still correlated and cross-section effects are removed from the equation by differencing equation. We can get consistent estimates of α using 2SLS by introducing instrumental variables that are both correlated with Δy_{it-1} and orthogonal to $\Delta \upsilon_{it}$ (Bond, 2002). Based on the assumption that υ_{it} is a serially-uncorrelated lagged level $y_{i,t-2}$ is uncorrelated with $\Delta \upsilon_{it}$ and thus can be used as an instrumental variable for the first - differenced equation. In this context, the estimates are consistent in large N, and fixed T. However, 2SLS is not asymptotically efficient even if the complete set of available instruments is used for each equation and the disturbance term υ_{it} is homoskedastic.

Generalized method of moments (GMM) estimator for ARDL panel data is modeled by Arellano and Bond (1991) to get asymptotically efficient estimators. As in the case of 2SLS estimator, GMM approach starts with the first- differenced form of equation (3.2), i.e. equation 3.3.

Based on the previous assumption that υ_{it} is a serially-uncorrelated disturbance term, we use lagged levels of dependent variables as valid instruments in the first-differenced system $y_{i,t-s}$ where $s \geq 2$ and $t = 3, 4\ldots, T$ and exploit the moment conditions:

$$E\left(y_{it-s}\Delta\upsilon_{it}\right) = 0 \qquad s \geq 2 \text{ and } t = 3, 4\ldots, T \qquad (3.4)$$

However, GMM estimator based on the moment condition (3.4) produce inefficient estimates. We need to use explanatory variables as additional instruments (Cheng and Kwan,1999). However, we need to differentiate the endogenous variables and strictly exogenous variables

in x_{it} because strictly exogenous explanatory variables for both past and future Δx_{it} are valid instruments:

$$E(\Delta x_{it-s}\Delta \upsilon_{it}) = 0 \qquad t = 3, 4\ldots., T \text{ and all } s. \tag{3.5}$$

However, GMM estimation based on (3.5) will be inconsistent for s<0 if the model includes reverse causality in the sense that $E(x_{ir}\upsilon_{it}) \neq 0$ for r≥t. That is, x_{it} may be correlated with the future realizations of υ_{it}. By taking account this possibility, we may assume x to be weakly-exogenous, in the sense that $E(x_{is}\upsilon_{it}) = 0$ s<t, which proposes the following condition:

$$E(\Delta x_{it-s}\Delta \upsilon_{it}) = 0 \qquad t = 3, 4\ldots., T \text{ and } s \geq 2 \tag{3.6}$$

Equations (3.3) to (3.6) outline a set of linear moment conditions of standard GMM methodology Arrelano& Bond developed.

The consistency of GMM estimator depends on the validity of moment conditions outlined from equations (3.3) to (3.6). In other words, the model requires serially uncorrelated level disturbance term and exogeneity of the explanatory variable used as instruments in the first-differenced form of equation (3.2). The overall validity of instruments is checked by Sargan test. It is a standard test of over identifying restrictions. The test statistics have an asymptotic x^2 under the null hypothesis that instrument are valid, i.e., over identifying restrictions are valid (Bond, 2002). If we reject the null, the instruments are not valid; implying some of the explanatory variables may not be strictly exogenous. Different sets of explanatory variables may be treated as predetermined and checked the validity of instruments in this specification.

In addition, Arellano-Bond m_1 and m_2 statistics need to be used to the serial correlation of disturbances υ_{it} (Arellano and Bond, 1991). If υ_{it} is serially-correlated, the first differenced

disturbances $\Delta \upsilon_{it}$ follow a MA(1) process, indicating the first-order autocorrelations are non-zero but second or higher orders are zero. On the basis of differenced disturbances, Arellano-Bond m_1 and m_2 statistics test the null hypothesis of zero first-order and second-order autocorrelation respectively. That m_1 is insignificant or m_2 is insignificant signifies the presence of invalid moment conditions originated from the autocorrelation in υ_{it} (Cheng and Kwan,1999).

4. Data and Regression Variables:

The data used in this study covers a pool of 11 countries, including CEECc (Poland, Hungary, Czech Republic, Estonia, Slovakia, Romania, Bulgaria, Croatia, Macedonia, and Ukraine) and Turkey between 1990 and 2009. The selection of pool of individual countries is performed according to their different EU accession phases. The number of observations in the complete panel is 220 (=11×20).[2] The dependent variable is the *net FDI inflows (FDI)* in millions of U.S. dollars.

As signified in previous chapters, market-seeking FDI considers the market size and conditions of the host country. Thus, we expect the large market size affects FDI inflows positively. We use *GDP per Capita (GDP)* as the proxy for the market size.

If MNCs takes into account the factor costs, labor cost will be important determinants regarding the attraction of FDI. We expect high labor cost affects FDI inflows negatively. We *use Gross Average Monthly Wages (w)* in U.S. dollars and at current exchange rates.

Multinational investors also seek countries with a low risk, enforced by successful macroeconomic policy and economic reforms (Campos and Kinoshita, 2003).We use *annual average inflation(I)* to proxy for economic risk.

[2] The data used for estimation are unbalanced, because some observations for the variables used in the model are missing.

In addition, liberal degree of trade regime has significant effect on MNCs' investment decisions. Trade liberalization and removal of capital controls enforce the level of structural reforms, possessing favorable economic environment for foreign investment. We use *import per capita (IM)* US$, at prices and PPPs of 2005 to proxy liberal degree of trade regime of the host country.

As noted in previous chapters, agglomeration economies also exert positive influence over multinational investment due to positive externalities. To proxy agglomeration effects, we use a single variable, *the one-year lagged FDI inflow (FDI(-1)).* By introducing the lagged value of the dependent variable as an explanatory variable, we will allow dynamic effects, i.e, AR(1) process, into the model. Therefore, the inclusion of the one-year lagged FDI inflow variable into the regression enable the ARDL specification of our model.

The last explanatory variable we will use in the model is a dummy indicating EU accession phases of host countries. As noted earlier, front-runner countries regarding the EU accession prospects receive large amount of foreign investment. To proxy EU accession prospects we use a dummy variable, which we develop on the basis of integrated announcement dummy variable developed by Bevan&Estrin (2004). The authors constructed the dummy variable by assuming that the EU accession announcements caused a structural shift from the announcement date until the end of the time horizon. On the basis of this formulation, we set up an updated *integrated dummy reflecting the EU accession prospects (EU),* i.e., namely phases, of the individual countries in our sample.

Table 1: Formulation of Integrated Dummy reflecting EU Accession Prospects:

	PL	HU	CZ	EE	SK	RO	BG	TR	HR	MK	UA
1990	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0
1994	1	1	0	0	0	0	0	0	0	0	0
1995	1	1	0	1	1	1	1	0	0	0	0
1996	1	1	1	1	1	1	1	0	0	0	0
1997	1	1	1	1	1	1	1	0	0	0	0
1998	2	2	2	2	1	1	1	0	0	0	0
1999	2	2	2	2	1	1	1	0	0	0	0
2000	2	2	2	2	2	2	2	1	0	0	0
2001	2	2	2	2	2	2	2	1	0	0	0
2002	2	2	2	2	2	2	2	1	0	0	0
2003	2	2	2	2	2	2	2	1	1	0	0
2004	3	3	3	3	3	2	2	1	1	0	0
2005	3	3	3	3	3	2	2	2	2	1	0
2006	3	3	3	3	3	2	2	2	2	1	0
2007	3	3	3	3	3	3	3	2	2	1	0
2008	3	3	3	3	3	3	3	2	2	1	0
2009	3	3	3	3	3	3	3	2	2	1	0

Source: Constructed by authors

According to this formulation, the value of 0 indicates that EU does not approve the country as a candidate yet. Dummy variable equals to 1 is the country becomes a candidate country of EU. It takes the value of 2 if EU announces the candidate county showed a good progress, and therefore, accession negations would begin. Finally, a value of 3 signifies the phase in which the accessing county gets the membership of EU.

Before empirical investigation of ARDL model, it is worth to analyze descriptive statistics of the series employed in the sample. We analyze descriptive statistics of the series at cross-section level to capture the heterogeneity across individual countries.

Table 2: Descriptive Statistics of FDI

FDI			
COUNTRIES	Mean	Std.Dev.	Obs.
BG	2366,65	3438,10	20
CZ	940,33	962,40	20
EE	907,52	930,29	18
HR	1666,03	1507,98	17
HU	11467,14	20215,33	20
MK	161,83	182,35	19
PL	7376,30	6455,69	20
RO	3283,33	4291,13	20
SK	1563,49	1574,32	16
TR	4812,00	7106,28	20
UA	2780,00	3615,34	17
All	3502,05	7829,10	207

Table 3: Descriptive Statistics of GDP

GDP			
COUNTRIES	Mean	Std.Dev.	Obs.
BG	7825,70	1648,75	20
CZ	17728,15	2898,96	20
EE	11976,05	4173,76	20
HR	13655,53	2335,12	15
HU	13902,15	2655,90	20
MK	7148,74	713,24	19
PL	11509,95	2924,07	20
RO	8073,50	1675,36	20
SK	14199,65	3373,13	17
TR	9769,20	1486,94	20
UA	5164,85	1445,16	20
All	10905,42	4355,21	211

Table 4: Descriptive Statistics of W

W			
COUNTRIES	Mean	Std.Dev.	Obs.
BG	141,90	88,90	19
CZ	554,45	331,66	16
EE	447,60	315,93	16
HR	755,55	271,32	14
HU	484,01	282,34	19
MK	373,86	98,63	9
PL	539,71	263,24	17
RO	210,42	170,90	19
SK	727,78	258,13	8
UA	107,69	90,51	16
All	411,37	312,40	154

Table 5: Descriptive Statistics of INF

INF			
COUNTRIES	Mean	Std.Dev.	Obs.
BG	97,69	239,17	20
CZ	4,83	3,56	16
EE	14,96	22,82	17
HR	145,46	362,31	20
HU	13,39	9,36	19
MK	112,97	359,23	18
PL	16,31	19,92	19
RO	69,91	83,43	19
SK	6,72	3,49	16
TR	50,43	32,28	20
UA	430,54	1143,68	18
All	89,04	392,15	202

Table 6: Descriptive Statistics of FDI

	IM		
COUNTRIES	Mean	Std.Dev.	Obs.
BG	5220,53	2489,10	15
CZ	9470,85	5227,18	20
EE	9526,59	4733,71	17
HR	6202,80	1666,64	15
HU	7798,89	4487,99	19
MK	3932,16	1247,27	19
PL	3672,85	2049,02	20
RO	2582,20	1973,15	20
SK	10003,29	4160,64	17
TR	1900,90	804,37	20
UA	2168,67	881,09	18
All	5589,10	4274,37	200

The average value of net FDI inflows is highest for countries front-runner countries, Hungary and Poland. In addition, the respective values of Turkey and Romania in which FDI inflows speed up from the date of their accession negotiations begin. FDI into Ukraine is also considerable such that its rich natural resources attract foreign investment.

The volatility of FDI is reflected from std. deviations of the respective series. It is interesting that the highest volatility of FDI exists in countries receiving the highest portion. Especially, the massive fall of FDI inflow of Hungary, even turns in net outflows, contributes to the highest respective value of the country. The value of Turkey is also high in comparison to many other countries in the sample. It is worth to state that high positive correlation exists between the mean and std. deviations of FDI inflows during this period.

Among descriptive statistics of explanatory variables, several points should be pointed out. Firstly, Czech Republic could not attract FDI as high as many countries in the sample in spite of its highest market share during the sample period. This implies that market motives may not be the main driver for foreign investors during the period. Low value of std. deviations of labor cost indicates rather a stable pattern for the variable for each country. The lowest

average values belong to Romania, Bulgaria, and Ukraine. High inflationary periods of the CEECs and Turkey in 1990s contribute to the high mean values of the respective series. On the other hand, it seems that high price level does not constitute an obstacle regarding foreign investment because FDI activity into the pooled countries increases on average from the beginning of the time horizon. Finally, import per capita on average is the lowest for Turkey, which may originated from the higher population of the country compared the others.

4.1 Unit Root Tests:

Generally, time dimension of dynamic panel data is short with the number of cross-sections (T) is larger than the number of observations over time (N). However, when the pooled data involve larger T, the time-series properties of variables become considerable. Therefore, time-series problems must be detected and coped with these problems to avoid spurious regressions[3] (Im, Pesaran,&Shin, 2003). Based on time series literature, the unit root tests detect whether a series is non-stationary, i.e., whether it has a unit root.

Two groups of unit root tests dominate for panel data in the theoretical literature. The first group is based on panel homogeneity implying common unit root process for all cross-sections. The second panel unit root tests assume panel heterogeneity in the sample. By assuming panel heterogeneity, these tests are based on individual common unit root test for each cross-section. From this perspective, we will employ Im, Pesaran, and Shin (IPS) panel unit root test to allow individual unit root test processes so that panel-specific results vary across cross-sections (Im, Pesaran,&Shin, 2003). The number of lags is specified according to Schwarz Information Criteria with the automatic selection of maximum lags. In addition, because IPS test statistic requires the specification of the deterministic component of each

[3] Spurious regressions are regressions in which dependent variable and expalnotary variables are spuriosly correlated with overstated t-scores and overall fit.

cross-section, we estimate the test statistic with equations including only individual constant, and both individual constant and trend term. The results of the test are given in Table 7.

Table 7: Results of Im, Pesaran, and Shin (IPS) Panel Unit Root Test[4]:

	Im, Pesaran and Shin W-statistic							
Variables	FDI	GDP	GRW[5]	INF	IM	W	D(W)	D(D(W))
Constant	2,97	1,55	-4,10***	-37,54***	-0,15	12,90	1,98	-5,15***
Constant&Trend	-5,06***	-1,23	0,62	-27,26***	-2,20**	5,36	0,78	-2,40***
Integration Level	I(0)	I(1)	I(0)	I(0)	I(0)	I(2)	I(1)	I(0)

*, **, and *** represents statistical significance at 99%, 95%, and 90% confidence interval respectively.

IPS test shows that among the regression variables only GDP per capita and gross monthly wages are non-stationary. We transform theses variables, containing unit root, to get rid of non-stationarity problem by transforming GDP to growth rate of GDP (GRW) and by taking the first difference of W (D(W)). Although D(W) still contains unit root, we do not prefer to take its one more difference because the original series would loose its economic meaning, which is as important as the statistical requirements for the model.

4.2 Empirical Model:

As explained above, first-order autoregressive distributed lag model (ARDL) has been used widely for analyzing dynamic effects for panel data. The lagged dependent variable is used as one of the explanatory variable in this model to capture the effects of current and lagged explanatory variables. From this perspective, we will employ partial stock adjustment model developed by Cheng and Kwan (2000) in which they estimate the role of past FDI values as a process of partial stock adjustment. Because OLS and 2SLS estimators yield inconsistent estimates for ARDL , we will rely on GMM technique developed by Arrelano

[4] The test assumes asymptotatic normality

[5] $GRW = [GDP - GDP(-1)] / GDP(-1)$

and Bond (1991). Still, we also estimate ARDL panel with random effects[6] OLS estimator for comparison. The estimation results are tabulated in Table 8.

Table 8: Determinants of FDI: GMM and Random Effects Model

Independent Variables	Label	GMM	RE
Lagged FDI	FDI(-1)	0,62***	0,98***
		(0,00)	(0.00)
Market size	GRW	11436,64	-6406,03
		(0,13)	(0,59)
Liberal degree of trade regime	IM	0,50***	0,06
		(0,00)	(0,65)
Inflation	INF	4,97	-0,62
		(0,11)	(0,52)
Labor cost	D(W)	3,06	3,46
		(0,35)	(0,73)
EU accession prospects	EU	1092,63***	489,63**
		(0,00)	(0,05)
Number of obs.		117	136
Sargan test			
Second order autocorrelation			
R			0,68

Note: *, **, and *** represents statistical significance at 99%, 95%, and 90% confidence interval respectively.Figures in parentheses are *p*-values.

Table 8 reports GMM and random-effects results for the pooled sample. Although both estimators' results resemble to some extent, the inconsistent estimates of RE is visible from the negative sign of the coefficient of market size. In addition, in contrary to GMM, the coefficient of IM is insignificant in RE model. Still, the significant estimates of lagged FDI and EU accession prospects comply with our expectation based on the theory.

GMM estimates the coefficient of lagged FDI α *i*s 0,62, implying the coefficient of partial adjustment β of 0,38. This means that net FDI inflow in one year is 38% of the difference between equilibrium level of FDI stock and current FDI stock. In other words, the difference between equilibrium, desired FDI stock, and current FDI stock will be closed after about 2,5

[6] Hausman test does not reject the random effects model.

years in case the equilibrium level of FDI stock does not change. In addition, the coefficient is statistically significant at 1% significance level, implying that the effect of agglomeration economies on FDI inflows is positive and significant. In other words, past activity of other MNCs is an important determinant for MNCs' multinational investment.

The insignificant coefficient of market size indicates that market-seeking FDI would no dominate in these countries. From statistical point of view, we would get significant result of market size if we had not transformed the explanatory variable in levels (GDP) to growth of the series. On the other hand, we know from the empirical literature that efficiency- seeking motives have been more important than market-seeking motives for CEECs and Turkey during the time horizon of the sample. Therefore, this result is also acceptable.

The significant effect of liberal degree of trade regime also complies with the expectations that the theory suggests. From this perspective, trade abolishment of trade controls-quotas, liberalizing exchange rate restrictions and modernization of tariff rates increases FDI flow into CEECs and Turkey because foreign investors may be well informed of local environment of the host country by trading and more attracted to the country they have better knowledge
The effect of inflation is positive and significant. In fact, CEECs with relatively low price level are expected to receive more FDI because low inflation is an indicator for macroeconomic stability and reduced default risk. Although this empirical finding contradicts the theory suggests, the high inflationary periods of CEECs and Turkey during 1990s may contribute to insignificant result. In addition, it can be inferred that EU accession dummy has already includes the effect of risk perceptions because candidate/accessing country has to harmonize its regulations in terms of broad aspects including, diversified from its financial system to intellectual property rights.

Labor cost is found to be positive and insignificant. This result is also not surprising because resource-seeking FDI have not dominated in CEECs and Turkey during the time horizon of data. For instance, Romania, Bulgaria, Macedonia, Turkey and Ukraine in which the wages are lower compared to those of other countries, did not receive large amounts of FDI in particular during the early transition period. Rather, EU accession prospects of these countries rather than cost-specific factors were the main drivers of MNCs' investment activity.

Finally, we found the effect of EU accession prospects, which is our main interest, positive and statistical significant at 1% significance level. The significant result of the variable supports our hypothesis that EU accession phases of CEECs and Turkey contribute the speeding up of multinational of MNCs into these countries significantly. This result also enforces our expectation that efficiency-seeking FDI, whose motive is driven by the geographically dispersed activities, dominates the region during the time horizon of data. From this point of view, it can be inferred that economic integrations and supra-national economic structures have a direct and positive effect on FDI inflows.

5. Conclusion

In a dynamic panel model, we investigate the factors accounting for the geographical patterns of FDI inflows to 11 transition countries of Europe for the period 1990-2009. Whereas traditional FDI determinants, i.e., market size, labor cost, risk perceptions, are insignificant, we find that transition-specific factors, i.e., agglomeration economies, trade openness, and EU accession prospects have significant and plausible effects on FDI. From this perspective, efficiency-seeking motives prevail across the region rather than market-seeking and resource-seeking motives during the time horizon of data. From this perspective,

determinants of FDI inflows should be analyzed in the context of intensive globalization process, reshaped by many factors such as regional integration, new information and communication technologies. In other words, the motives that attacked foreign investment in 1970s should be analyzed now in the context of changes in the global economy, i.e., high development of communication and information technology as well as other transition-specific factors.

In addition, our empirical analysis implies that integration with the EU is important for FDI in transition economies. We find the effect of EU accession prospects on FDI flows into transition countries positive and significant. From this perspective, countries implementing EU accession regulations, enforced by market economy policies, successfully acquire EU membership earlier, which further speed up FDI that originates more growth and development. On the other hand, countries implementing EU regulations poorly are further from prospective membership, which may discourage FDI inflows.

Three interesting extensions of this research come into mind. First, econometric analysis may be performed with a larger sample, including CIS. Especially, CIS have been attracting the foreign investment due to their rich natural resources. We may get more comprehensive results by enlarging data and including a proxy for natural resources into our mode. Second, the effect of EU accession prospects on major macroeconomic indicators of transition economies of EU may be elaborated for future research. Specially, the contribution of EU accession progress of CEECs regarding their success of getting high inflation levels under control may be analyzed empirically. Finally, causal relationship between FDI and technology in transition economies of EU may be investigated in further analyses because development of

the technological infrastructure in the individual economies may have positive influence over their international trade and financial activities.

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