EURASIAN JOURNAL OF ECONOMICS AND FINANCE

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DETERMINANTS OF FDI INTO CENTRAL AND EASTERN EUROPEAN COUNTRIES: PULL OR PUSH EFFECT?

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Abstract

Despite the growing interest in foreign direct investments (FDI), substantial uncertainty still exists regarding what stimulates foreign investors to operate in a foreign market and uneven distribution of FDI across countries. Using panel data for 2001 -2012 period, the major determinants of the FDI inflows into the Central and Eastern European Countries are analysed in this study. Strong evidence are found that while EU CR indices, EU and USA real GDP growth rates and global financial crisis have power to explain FDI inflows among all other push factors, labour cost, electricity price, real exchange rate and host CR indices have strong influential on FDI as the most effective pull factors. However, study fails to find any effect of openness, tax rates on commercial profits, USA CR indices, interest rate differentials and host real GDP growth on FDI.

Keywords: Foreign Direct Investment, Panel Data, Capital Flows, Push Factors, Pull Factors

1. Introduction

International trade and foreign direct investment (FDI) flows stand out as the fastest-growing economic activities in the global environment in the past two decades. A critical analysis of global FDI flow data issued by UNCTAD (United Nations Conference on Trade and Development) (2008) showed that global FDI inflows have increased gradually over time and reached a peak level of $1,833 billion in 2007, with a 30% increase compared with 2006. Despite growing interest in FDI inflows, the major reasons behind foreign investors seeking a country in which to invest and the uneven spatial distribution of FDI across countries are still unanswered questions in both the theoretical and the empirical international business literature.

On the one side, as isolated transition countries, Central and Eastern European countries (CEECs) have lagged behind their Western European counterparts. Hence, the process of integration into the European Union (EU) and liberalisation of their trade and payment regimes since the 1990s have been paramount economic objectives for these countries. Since the perception of FDI changed to become an essential engine for the process of economic, political, and social transformation and integration into the EU, the past decade has witnessed remarkable growth in European- and US-originated investments in these countries. Additionally, attempts to improve investment climate in Turkey such as legislation of new FDI, Law 4875 on June, 5 2003 along with the start of negotiation with council of EU as a candidate of member state at the end of 2004 have accelerated FDI inflows into Turkey since 2005.However, despite the acceleration of FDI policies aimed at converting the CEE regionand Turkey into an ideal destination for future investments, the distribution of FDI across countries is still uneven and disparate in terms of both level and growth. Hence, a detailed examination of the FDI structure with respect to their determinants for these countries would provide important insights into future policy formation.

The main objective of this study therefore is to investigate the major determinants of FDI flow into CEECs and Turkey. The paper's contribution can be explained as follows. First, the study employ

the most important unconventional push and pull factors of FDI simultaneously to have a better understanding of FDI structure in the region. Second, according to my knowledge, this is the first attempt to employ energy prices for CEE region. Since the majority of the countries in the sample have an industrial sector accounting for a substantial share of economic activity, inclusion of energy prices is urgently warranted. Third, the aggravating effects of the global financial crisis on FDI flows are one more confirmed with this study.

The remainder of this paper is organised as follows.In Section 2 review of the theoretical and applied works are presented. This is followed by a description of data and methodology in Section 3. The empirical results are presented and discussed in Section 4. The last section contains some concluding remarks.

2. The Determinants of Foreign Direct Investment

There are mainly two economic and political factors are hold responsible to attract FDI inwards into host country. These are namely economic and political push factors and pull factors. Push factors respresent the international conjuncture in the world andhome country specific factors that motivate and push a country to invest in another country. While, many economists defend the importance of push factors in determining the volume of FDI inwars into host country, someothers defend the significance of pull factors which represent the economic structure of host countries that FDI flows shifted.

2.1. Push Factors

As Dunning (1977; 1973) suggested, there are three primary motivations for FDI outflows, which are foreign market-seeking FDI, efficiency (cost reduction)-seeking FDI, and resource-seeking FDI. Based on this framework, researchers have analyzed motivators of FDI outflowsin both developed and developing countries. For example, Kayam (2009) investigated the home country factors that encourage FDI outflows for 65 developing and transition countries for the 2000–2006 period. Finally, she concluded that small market size, trade conditions, costs of production, and local business conditions within the home country are the major push factors that cause FDI outflows. Moreover, Buckley *et al.* (2007) examined the determinants of Chinese FDI outflows. They found that Chinese FDI outflowsare highly correlated with political risks experiencedin the country, cultural proximity with the host country, and the host country's natural resources endowments. On the other hand, Tolentino (2008) examined the relationships between home country-specific macroeconomic factors and FDI outflows of China and India for the period between 1982 and 2006. He had an interesting conclusion, arguing that country-specific factors of China such as the interest rate, openness to international trade, income per capita, human capital, technological capability, exchange rate, and exchange rate volatility do not have a significant effect on FDI outflows in China, while India's technological capability results in FDI outflows in India. In short, home country-specific factors are the other side of the coin perceived by MNFs and should also be considered when determining the significant factors affecting FDI inflows and adopting policies to pull them into the host country.

2.2. Pull Factors

One of the most important determinants of FDI inflows into host country is the gross national product (GNP) or gross domestic product (GDP), which serves as a proxy for the market size in the host country or home country. In the literature, studies done by Campa (1993), Tokunbo and Lloyd (2009), Dunning (1973), Erdal and Tataoglu (2002), Dumludag (2008), Esiyok (2011) emphasized the importance of market size for FDI inflows, and these studies suggest a positive relationship between market size and FDI. Incentives for foreign investors to invest abroad may be the inadequate domestic demand in the home country. Thus, it is generally expected that there is a negative relationship between FDI and the market size of the home country, but a positive relationship between the market size of the host country and FDI inflows.

The cost of borrowing can also play an important role in the amount of FDI inflows into a country. If a foreign entity borrows funds to support its production operations in ahost country, the expected relationship between the interest rate and FDI is negative. But if the foreign entity borrows

funds in the home country instead of the host country, a lower cost of borrowing in the home country will lead to more FDI inflowsinto the host country. Tokunbo and Lloyd (2009) showed that the interest rate in the host country is the main determinant of FDI inflows into Nigeria. Several researchers have also pointed out the importance of a host country'sopennessto FDI. Since FDI is an important part of globalization, it is generally assumed that a country that is more open attracts more FDI inflows due to providing a basis for export-oriented foreign investors in the host country (see Awan *et al.* 2011; Feng, 2011; Walsh and Yu, 2010). Further more, the legal restrictions associated with business activities comprising various taxes, regulations on trade like tariffs, incentive policies aimed to attract FDI, or sector-specific restrictions on foreign ownership and entry might be considered important determinants of FDI in the host country.

Moreover, most studies have also emphasized the role of the infrastructure of a host countryin determining the amounts of FDI inflow. Erdal and Tataoglu (2002), Esiyok (2011) and Deichmann *et al.* (2003) have all suggested apositive relationship between a host country's improved infrastructure and FDI inflows. The labor cost also impactsthe volume of FDI inflowsto a host country. Many works in the literature concerning the effect of labor cost accounted for higher FDI inflowsinto the host country. Since the aim of foreign investors is to gain profits in their investments abroad, it is generally assumed that a lower labor cost positively affectsthe FDI inflows to a host country (see Kar and Tatlisoz, 2008; Yeo *et al.* 2008; Liu *et al.* 2012).

The effect of the exchange rate and its volatility on FDI inflows is also ambiguous and undetermined. Many studies suggest that the depreciation of host countries' currency encourages the amount of FDI inflows. For example, Froot and Stein (1991), Kaya and Yilmaz (2003), Vergil and Cestepe (2005), and Kar and Tatlisoz (2008) have suggested that that exchange rate depreciation increases the competitiveness of host countries in the international market, meanwhile reducing the prices and resource cost in the host market. So, export-oriented foreign investors choose to invest in a country whose domestic currency depreciates against foreign currency. However, some of the studies also defend the positive relationship between them. The rationality behind this view is that FDI can be carried out by a foreign entity with the intention of producing for the local market instead of producing for the international marker in the host country. Thus, an appreciation of the host country's currency increases the purchasing power of domestic households, which also leads to higher domestic demand. So, according to advocators of this view, there is a positive relationship between the appreciation of currency and FDI inflows, as shown by Dhakal *et al.* (2010) and MacDermott (2008). With respect to the effect of exchange rate uncertainty on FDI inflows, there are also conflicting results in the literature. Some researchers have found a positive and others a negative association, and still others claim there is no relation at all between these variables.

3. Data and Methodology
3.1. Data

The total FDI inflows into CEE region including Turkey between 2001 and 2012 are specificed as the dependent variable. The data were retrieved from the Research Center International Economics Database Retrieval Tool (http://www.fiw.ac.at/index.php?id=1). I identified the following as my explanatory variables: Country Risk (CR) indices of CEECs and Turkey (as host country pull factors) along with those of the EU area and the US (source country/area push factors).[1] Furthermore, while labor cost, total tax rates of % commercial profits, openness, real exchange rate, electricity price, real GDP growth rate of each host country are specifed as the most prominent pull factors, interest rates differentials between host and home (the EU area) country and real GDP growth rate of USA and EU countries are determined as source country push factors. Lastly, a dummy variable is included to account for the global financial crisis.While CR indices of CEECs and Turkey, the EU area, and the US come from the Political Risk Service (PRS) Group, International Country Risk Guide 2012 electronic data server (www.prsgroup.com), Real GDP growth rates of each host country, USA and EU area and electiricty prices, are attained from from the European Commission European Statistics data server (http://ec.europa.eu/eurostat). Furthermore, while export and import values as part of the calculaton of openness along with labor cost, and real exchange rates are obtained from International Monetary

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[1] See the study of Bilgili *et al.* (2012).

Fund (IMF) data (www.imf.org); GDP and interest rates are taken from World Bank data server (www.worldbank.org).

Adittionally, defininiton of datas and expected sign is given below:

a. Push Factors

CR Indices. Most studies use CR indices or ratings taken from different sources to capture the impact of the political, economic, or financial risks on FDI flows (see Bilgili *et al.* 2012; Arbatli, 2011; Janicki and Wunnava, 2004; Carstensen and Toubal, 2003; Bevan and Estrin, 2004).Here, CR is a composite index of the financial risk, political risk, and economic risk indices of 16 Eastern European countries and Turkey, the EU area, and the US for the period between 2001 and 2012. Owing to the dominant share of FDI inflows into these countries coming from the EU area and US, reasonably, I include the CR indices of the EU area and US to account for risks originating in the home country. Moreover, the CR indices of the EU area represent the average CR indexes of Belgium, Austria, Denmark, England, Finland, France, Germany, Italy, the Netherlands, Norway, Sweden, and Switzerland.

Interest Rate Differentials. One of the most important global push factors is known as the interest rate denoting the international liquidity and credit conditions of the home country. Interest rate refers to the cost of borrowing to finance investments in home or host markets. As such, the interest rate in the source country may have a varying impact depending on the borrowing behaviour of investors. If the investors undertaking FDI borrow from the home country, the availability of a relatively low interest rate in the source country will prompt MNCs to invest in foreign markets because of the cost advantage of raising capital. On the contrary, if firms can borrow from the host country, a relative increase in the interest rate in the source country may also push foreign investors to direct their investments into foreign markets in order to benefit from the lower cost of borrowing. Hence, inclusion of ineterst rates neccesiates taking differentials between host and home country.

Real GDP Growth Rates. This variable accounts for the growth and development of an economy and may be a good proxy for the market size of that country (see Campa, 1993; Tokunbo and Lloyd, 2009; Erdal and Tataoglu, 2002; Dumludag, 2008; Esiyok, 2011; Bilgili *et al.* 2012).

Dummy to Account for Global Financial Crisis. The collapse of the US real estate property market at the end of 2007 evolved into one of the worst global financial crises ever experienced in economic history. The financial meltdown took its toll on FDI flows worldwide with the global propagation of the ripple effects of the collapse and ensuing bankruptcy of many large institutions in the US and elsewhere. The capital flows into these 16 economies also suffered the ripple effect of the global financial crisis similar to those moving to other developing countries. To capture its impact, a dummy variable taking the value of 1 for 2009 and after and 0 otherwise is also introduced into the component models. Rational for choosing 2009 is that while developed countries have experienced a drastic fall in FDI inflow in 2008, in spite of a slowdown in 2008, most of the developing ones, including CEECs have felt deteriorating effect of financial crisis in 2009.

b. Pull Factors

Real Exchange Rate. The real exchange rates of Turkey and CEE countries in the study are calculated simply as the nominal exchange rate, $e_{i,d}$ multiplied by the ratio of domestic price level, PPI_d to foreign price level PPI_f. Consequently, a decline in REX_t can be interpreted as a real depreciation of the exchange rate, whereas an increase corresponds to a real appreciation. An analysis of the FDI literature shows mixed evidence in terms of the impact of exchange rate level on FDI inflows. For example, while Froot and Stein (1991) and Cushman (1985) claimed a negative correlation between FDI and exchange rate level, Campa (1993) proposed the opposite point of view.

Labor Cost. A lower labor cost is another motive for a certain level of foreign capital movement, particularlyin labor-intensive industries that do not require highly educated employees. Becasue of the majority of countries in sample having mostly labor intensive industries, reasonably, labor cost is included in the model as the primary production cost factor (see Liu *et al.* 2012; Yeo *et al.* 2008).

Total Taxes on % of Commerical Profits. The World Bank defines total tax rates as "total tax rate measures the amount of taxes and mandatory contributions by businesses after accounting for allowable deductions and exemptions as a share of commercial profits. Taxes withheld (such as personal income tax) or collected and remitted to tax authorities (such as value added taxes, sales taxes or goods and service taxes) are excluded.[2] Since, higher tax rates on commercial profits are an extra cost factor reducing profitability for foreign investors, this type of tax can be regarded as among the principal determinants of FDI inflows in industry inetensive markets. Thus, its inclusion in the model is essential.

Openness. Openness is calculatedsimply by summing of export and import values of each host counry and then deviding to its GDP. Matematically, it can be shown as $(\exp ort + import)/GDP$. Hence, this ratio is included in the model as a proxy to measure the impact of host country openness in international tarde on the FDI inflows in Turkey and CEECs (see Awan *et al.* 2011; Feng, 2011; Walsh and Yu, 2010).

Electricity Price. Energy prices can be regarded as one of the most prominent factor to explain movements in FDI flows into Turkey and CEECs. The majority of the countries in the sample have industry intentsive businesss accounting for a substantial share of economic activity. Beyond, given the fact that electricity is the major input in total manufacture industry and each sub-sectors, inclusion of electricity prices into the model is warranted (see Bilgili *et al.* 2012).

Furthermore, expected sign of the coefficients is given in Table 1 below.

Table 1. Expected Sign of the Coefficients

Variables	Expected Sign
Host CR Index	+
CR Indices of EU and USA	-
Dummy For Global Crisis	-
Labor Cost	-
Taxes	-
Openness	+
Host Real GDP Groth Rate	+
USA Real GDP Growth Rate	+/-
EU Real GDP Growth Rate	+/-
İnterest Rate Differentials	-
Electricity Price	-
Real Exchange Rate	+/-

3. Methodology and Data
3.1. Methodology

To estimate the impact of the determinants of the total FDI into CEECs and transition countries for 2001–2012, balanced panel data were obtained from a pool of 16 countries, namely Albania, Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia, Slovakia, Belarus, Moldova, Russia, Turkey, and Ukraine. The main reason for collecting a panel data set is generally to allow unobserved factors (here, country-specific factors, denoted by a_i, to be correlated with the explanatory variables. In panel data analysis, unobserved factors are allowed to affect the dependent variable with the existence of two types. The first ones are those that are constant over time, and the others that those change over time. Consider an unobserved effect model with k explanatory variables:

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[2] http://data.worldbank.org/indicator/IC.TAX.TOTL.CP.ZS

For each i,

$$Y_{it} = \beta_1 X_{it1} + \beta_2 X_{it2} + \dots\dots\beta_k X_{itk} + a_i + u_{it}, \quad t = 1,2,\dots\dots\dots\dots\dots..T$$

Here the parameters of interest, $\beta_k X_{itk}$ cannot be estimated by pooled OLS, because OLS assumes that a_i is uncorrelated with the explanatory variables. Therefore, the results will be biased and inconsistent with OLS and the resulting bias is called heterogeneity bias. However, there are two panel data models that are used to eliminate the problem of heterogeneity bias in pooled OLS. These are called fixed-effect transformation (FE) and random-effect (RE) models. We are able to eliminate the unobserved effect, a_i from the equation and therefore the problem of heterogeneity bias by averaging the unobserved effect model over time for each i, by using the time demeaning on each explanatory variable and then subtracting it from the first equation. The aim of the fixed-effect transformation is to eliminate a_i since it is thought to be correlated with the explanatory variables. However, in the case of the random effect, this is not the case, such that a_i is assumed to be uncorrelated with each explanatory variable in all the periods. The superior side of the random effect across the fixed effect is to allow us to include unobserved variables in the model that are constant over time.

Prior to the estimations, consistent with econometric theory, the Lagrange multiplier (LM) test and Hausman (1978) test are carried out to determine the existence of a random effect and to ascertain which model is superior to the other, respectively. The LM test is conducted to test for the presence of heterogeneity by testing the null hypothesis $H_0 = \sigma_a^2 = 0$ against the alternative $H_1 = \sigma_a^2 > 0$ one rejects the null hypothesis, which means there is a random effect. Otherwise, failing to reject the null hypothesis implies that $a_i = 0$ or every country and there are no country specific differences and no heterogeneity to account for. On the other hand, to check for the presence of any correlation between the unobserved factors, a_i and regressors in the random effect, we can use the Hausman test. The idea underlying the Hausman test is that the estimators of both RE and FE are consistent and converge to the true parameters β_k in large samples, if there is no correlation between a_i and the explanatory variables X_{itk}. That is, in large samples, if we fail to reject the Hausman test, the RE and FE estimates are similar; otherwise, rejecting the Hausman test means that a_i is correlated with any X_{itk} and the random-effect estimator is inconsistent while the FE estimator remains consistent.

Overall, to capture the impact of these determinants on total FDI, I formulated the equation as follows:

$$Y_{it} = \beta_0 + \sum_{k-1}^{K} \beta X_{itk} + u_i + \varepsilon_{it}, \quad t = 1,2\dots\dots\dots\dots..T, \quad i = 1,2\dots\dots\dots K$$

where the i and t subscripts account for the country and period indexes, while X_{itk} represents the set of explanatory variables described above and u_i and ε_{it} represent the unobserved country-specific factors and random error term, respectively.

4. Empirical Results

Prior to the estimation, we must decide whether the pooled model across the countries under the same slope and intercept assumption or a model allowing country-specific effects is valid. Since the former implies that variance of the country-specific effect is zero under the null hypothesis, I first carry out the Lagrange Multiplier (LM) test by adopting a random effects (RE) specification to determine the existence of an RE against no effect. Once the pooled model is rejected, we must choose between the fixedeffects (FE) and RE specification by using the Hausman test. To implement this, the models are first estimated by FE and then by RE and the results are stored in each turn. Under the null hypothesis, the RE is both efficient and consistent, whereas inconsistent otherwise. Table 2 yields the test statistics and p-values below.

Table 2. Estimation Results of Random Effect

	Coefficient	P>Z
Constant	2777.466	0.007
Host CR Index	5.31622	0.003**
USA CR Index	6.172276	0.101
EU CR Index	-43.27972	0.001**
Dummy for Global Crisis	-95.05415	0.019**
Labor Cost	-.4425794	0.037*
Taxes	-.4370529	0.177
Openness	-1.40e-07	0.760
Host RGDP Growth Rate	.276716	0.858
USA RGDP Growth Rate	-27.79402	0.000**
EU RGDP Growth Rate	25.15911	0.000**
Interest Rate Differential	.4866734	0.675
Electiricity Price	-332.3411	0.041*
Real Exchange Rate	131.2476	0.014**
Hausman Test Statistics	1.42	Prob.value: 0.999
LM Test Statistics	5.20	Prob.value: 0.000

Notes: ** denotes % 1 significance level while * denotes % 5 significance level. Both dependent and independent variables are measured in US Million Dollars.

The low probability value associated with the LM test statistic for the models points to the existence of strong country-specific heterogeneity. The next step concerns the Hausman test statistic values. This time probability value of 0.9999 is quite high, meaning that we cannot reject the null hypothesis that the RE estimator is both consistent and efficient. Therefore, I conclude that the FE and RE estimation results are similar and that I can rely on the test results of the RE.

As seen from Table 2, as expected, EU CR indices, labor cost, electricity prices of each host country, real GDP growth rate of USA and lastly dummy to account for global crisis are negatively correlated with FDI inflows into the region. On the other hand, CR indices and real exchange rate of each host country and real GDP growth rate of EU have power to affect FDI inflows positively.

The results can be interpreted as follows: with the rise in the source country (EU) CR indices and, the local investment environment becomes relatively more attractive; therefore, direct investment outflows into Turkey and CEECs decrease. On the other hand, an increase in the real GDp growth rate of EU stimulates investors to move into the region. That means, although EU investors are motivated by lower risks at home to repatriate their investments back, at the same time, they are induced to invest abroad withhigher real GDP growth. A possible explanation for this surprising result may be that of better borrowing opportunities may arise in EU in the event of a rise in real GDP. Since, higher GDP growth is approved as one of the most important economic developement indicators; this may be percieved as a good signal by financial instituations in terms of more payable funds. On the other side, while USA investors are unresponsive to the risks in the home market, they draw back their investments back with a higher real GDP growth at home. In other words, a rise in real GDP growth works as opposed to EU investors, and causes reversal of FDI from abroad to home market. Again, as expected, an increase in CR indices of each host country makes foreign investors to be more optimistic and more confident to invest in CEECs and Turkey. Thus, an increase in CR indices makes investors direct their investments into the Turkey and CEECs as ideal investment destination. Moreover, FDI inflows decrease with a rise in the labor cost and electricity prices which are accepted as the most important primary production cost factors. As seen from Table 2, the coefficient of electricity price is very high in value which meansinvestors are severely sensitive to electricity price in the host market. Actually, this result is not a surprise such that electricity price is the primary input in the manufacturing industry and therefore it is the main determinant of resource cost. Thus, one can simply argue that foreign investors are explicity profit oriented and reduce their investments in case of higher resource cost of production to avoid higher payments. Furthermore, foreign investors are very sensitive to the movement in the exchange rate so that a real appreciation of host currency causes investors to increase in the reagion. This result is compatible with the study of Campa (1993) who argued that an appreciation of the host country's currency will increase inward FDI since multinational firms seek profits in the local market, and if they are optimistic about future profitability they will

increase their investment in that market. Lastly, the dampening effect of the global financial crisis on total FDI flows are adequately captured as indicated by the negative and significant coefficient of the 2009 downturn.

5. Concluding Remarks and Summary

The last decade has witnessed remarkable FDI growth in CEECs and Turkey, which has originated largely from the Euro area and US. This growth has been attributable to the integration process of CEECs into the EU and the switching from protectionist trade regimes to export-oriented policies, leading therefore to the elimination of barriers to FDI. Despite the acceleration of FDI policies associated with the transition processes of these economies, the distribution of FDI across countries has remained uneven and heterogeneous in terms of both level and growth. Thus, the main objective of this study is to measure the determinants of FDI inflows into Turkey and CEECs.

The novelty of the present paper is twofold. First, study employs both pull and unconventional pushfactor variables such as the CR indices of the EU and the US along with country-specific CR indices simultaneously to better understanding of the FDI structure in the region. Second, this study is the first attempt to measure the impact of the energy price as the major factor of production cost on FDI inflows in Turkey and CEECs.

The results show that while, EU CR indices, EU and USA real GDP growth rates and global financial crisis have power to explain FDI inflows among all other push factors, labor cost, electricity price, real exchange rate and host CR indices have strong influential on FDI as the most effective pull factors. Thus, one can simly argue that both push and pull factors play role in the amount of FDI structure in the region. On the other hand, study fails to find any effect of openness, tax rates on commercial profits, USA CR indicies, interest rate differentials and host real GDP growth on FDI. Confirmation of electricity price as the main determinant of investment decision in the Turkey and CEECs, makes me to suggest the FDI policy maker to reregulate energy maket and reduce prices that please more investors.

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