International Journal of Social Science and Economic Research

ISSN: 2455-8834

Volume:06, Issue:10 "October 2021"

DETERMINANTS OF FDI IN CEE COUNTRIES

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DOI: 10.46609/IJSSER.2021.v06i10.006 URL: https://doi.org/10.46609/IJSSER.2021.v06i10.006

ABSTRACT

Using a panel data analysis over the period of 1996-2019, we try to identify the major determinants of foreign direct investments inflows to five CEE countries. The Pedroni and Kao cointegration test results show the presence of long-run relationships between FDI and financial developments, economic growth, inflation, trade openness, labor cost, and real effective exchange rate (REER). Using a Fully Modified Ordinary Least Squares (FMOLS) and the vector error correction model (VECM), the real GDP per capital, labor cost, and trade openness have a positive and significant impact on FDI inflows. On the other hand, transition countries don't need better developed financial markets in the FDI-growth nexus. The empirical analysis on CEEs data revels that the compensation of employees as a share of GDP, used as a proxy for labor cost, has a positive effect on FDI and is statistically significant. This implies that higher wage levels increase FDI inflows into transition economies, one of the positive spillovers of foreign companies in home countries where they operate, by offering higher wages for more qualified labor force who can adopt new and advanced technology easily.

Keywords: foreign direct investment, financial development, fully modified ordinary least squares (FMOLS), panel cointegration.

JEL classification: E22, F21, O52

1. Introduction

Many specialists considered that foreign direct investment to be more conducive to long-term economic growth than alternative capital for the developing countries. The attraction of FDI can stimulate the capital formation and therefore the employment and can lead to increased labor productivity through the advanced technology, the know-how spillovers, and the management and marketing skills.

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Over the last decades, developing countries have enforced investment policy measures to offer stimulants and reduced barriers for the entry of foreign investors. Incentive-based competition for FDI has become a wide-spread phenomenon, involving national and sub-national governments in both OECD countries and in developing economies (Oman, 1999).

A vast literature suggest that the impact of the FDI on economic growth is determined by some factors in the recipient economy. Understanding what the determinants that lead to increased FDI flows are and revealing why some countries attract more foreign capital than others, it can provide guidance for some policy-makers for future investment policies. More studies conclude that factors specific to companies, industries, and location variables affect decisions to undertake FDI.

There is a long discussion concerning the determinant factors for the rich countries which might not be the same as those who attract FDI to developing economies. Developing economies have relatively higher inflation, poorer quality of institutions, and lower financial development than the developed economies. Since high volumes of FDI go to emerging economies, it's clear that foreign investors are investing in emerging markets due to a different balance of considerations than those investing in more developed countries, high level of education, technology infrastructure, and macro stability, in exchange for lower labor costs, larger technological gaps or a protected market.

The countries that are more attractive to foreign investors are those with potential markets and a low country risk, which pay attention to innovation and research, and offering a high return on capital (Moosa, 2009).

Given the importance of this topic, this empirical study estimated a panel FDI function using Fully Modified Ordinary Least Squares (FMOLS) to identify the determinants of FDI inflows to five countries from CEE during the 1996-2019 period. The results of the econometric model applied show that the market size, labor cost and trade openness play an important role in attracting FDI flows in the developing countries. On the other hand, the transitions countries don't need better developed financial markets to encourage foreign companies to bring capital. The empirical analysis on CEEs data reveals that labor cost has a positive effect on FDI and is statistically significant. This implies that higher wages increase FDI inflows into transition economies, one of the positive spillovers of multinationals in recipient countries, by offering incentives for more qualified labor force who can adopt new and advanced technology easily.

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Section 2 focuses on a short literature review on the determinants of FDI. Data and methodology are discussed in section 3. Section 4 presents the empirical findings and the last section summarizes the conclusions.

2. Literature review

The impact of foreign direct investment on the growth process was analyzed by many economists, showing a positive relationship between foreign capital and the GDP rate, but it is very important to determine, especially for government decedents, the reasons behind the investment decisions of multinationals. Being not completely exogenous, FDI depends on several factors and it is necessary to know which the relevant determinants of FDI are for the developing countries.

The determinants of FDI can be grouped into two major categories: traditional determinants like the market size, the distance between the home and the host countries, the transaction costs, and transition-specific determinants like privatization methods, the level of corruption in the host economies, the quality of the infrastructure and the country risk. In this study our focus will be on the traditional determinants of foreign direct investments for the CEE countries.

The level of economic developments of the recipient country leads to more FDI flows. Countries with higher level of GDP usually receive higher flows of foreign capital (Hunya, 2015; Khachoo& Khan, 2012). In a complementary relationship with foreign direct investment, domestic investment contributes to the economic development of the recipient economy (Lean &Tan, 2011).

The market size and therefore the trading cost are the foremost decisive factors for attracting foreign capital due to the greater opportunities for investors (Bevan & Estrin, 2000).

The impact of FDI on the economic development depends to the economic and political factors of the host country, on the level of the human capital and of the present technological capital, (Borenszterin et al., 1998).The quality of the institutions, the trade regime, and also the level of political risk play an important role in determining economic growth (De Mello et al., 1997).

In case of euro area, the standard of political institutions and economic structures are the major determinants of FDI inflows, but also labor costs, the trade openness, the market size, and the tax grants matter to attract more investors (Dellis et al., 2017).Campos & Kinoshita (2003) also find that the institutions and therefore the market size are the most important determinants for FDI inflows, but also the resource abundance and low labor costs can be an asset.Rachdi et al. (2016)

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argue that GDP growth and trade openness have a positive effect on FDI while inflation and real effective exchange rate have a negative and statistically significant effect.

Despite its decreasing weight in the production cost, labor cost remains a crucial factor determining the decisions of investors to choose the location of the implantation. Countries, where the labor cost is low, are preferred FDI destinations (Khachoo& Khan, 2012;Campos &Kinoshita, 2003; Bevan & Estrin, 2000).Labor costs are significant for the companies with a more intensive use of labor force, whilst the prices and therefore the abundance of resources are relevant into a production process (Neuhaus, 2006).

Usually, cheap labor motivates foreign firms to choose developing countries, while the trade measures, the economic and political stability trigger FDI inflows to developed countries. But, the policy-makers must ensure through the investment policies that competition to draw in more FDI inflows doesn't lower the environment, and core labor standards, and works in an upward direction (Oman,1999). By contrast, Benacek et al. (2000) concludes that the labor cost is not the most important factor of FDI inflows, but the market size and therefore the growth potential within the CEECs.

The quality of the labor force existing within the recipient country is more important than the labor cost because a more educated labor force can adopt the new technology easily. Also, the skill acquisition will be with a reduced cost. Beyond that, there's some evidence that one of the effects of foreign companies' presence is to increase the average level of wages, in their intention to hire more qualified and educated labor force by offering higher wages than local companies (Lipsey, 2002). Nevertheless, there could also be worries that FDI may result in a phenomenon of creative destruction (Jude, 2015) on the labor market by the introduction of labor-saving techniques, which cause a negative externality within the short run, however with positive effect in the long run, as foreign companies create linkages with local business.

Due to the restrictive investment policy measures imposed to foreign investors, countries from Central and Eastern Europe couldn't attract important foreign capital until 90's. After the restrictions were reduced and also the government offered the opportunities to transfer the state monopolies to private ownership, CEECs became more attractive to strategic investors. In line with Mistura&Roulet(2019), FDI restrictions along with foreign investment screening policies have had a strong negative impact on FDI inflows, being vital that governments continuously benchmark their investment clime against peer economies. Foreign investors are attracted by the transition countries where the trade openness is robust and with fewer restrictions on FDI inflows (Campos &Kinosita, 2003).

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Macroeconomic development and political stability are also vital to foreign investors. Also, political announcements regarding the method in EU accession can directly impact the volume of FDI, thereby improving economic process, but not through country credit ratings. In a study of the transition countries of CEE, Neuhaus(2006) finds that bigger market size, a low level of costs for energy, labor force, and natural resources, the stable fiscal balance, moreover as a stable political and institutional environment with a low level of corruption, and better political freedom, are all necessary to draw in large FDI inflows.

Boateng et al. (2015) confirm the positive impact of the real GDP, exchange rate, and trade openness on FDI inflows while inflation, unemployment, money supply, and interest rate produced significant negative results.

Jayasekara (2014) find that economic growth, inflation, lending rate, labor ,infrastructure, exchange rate stability, and corporate income tax are the major determinants of FDI flows in Sri Lanka.Ramirez (2019) using Dunning's OLI model in order to identify the economic and institutional determinants of FDI in Latin America, finds that the market size, the government expenditures on education, the credit provided by the banking sector, and therefore the level of economic freedom have a positive and statistically significant effect on FDI inflows. In contrast, a real depreciation of the national currency together with the public investment spending has a negative effect. The development of the existing financial sector in the recipient country is crucial for the magnitude of FDI and for higher growth rates, financial markets allowing the backward linkages between domestic firms and foreign investors to turn into positive FDI spillovers (Alfaro et al., 2009). Levine (1997) underlines some basic functions of the financial sector, namely facilitating the risk amelioration, resource allocation, monitoring the management teams within the best interest of the owners, mobilizing the saving by pooling the capital, and facilitating transactions through different financial instruments. Nor &Bahri (2016) have noticed that the upper level of financial developments of the host country will contribute to absorbing the positive spillovers of FDI in the long run. Walsh &Yu (2010) find that labor market flexibility and financial systems are more important for emerging economies than advanced ones, while a stronger exchange rate and low inflation will result in more tertiary FDI flows into advanced economies. Kugler&Neusser (1998) conclude that between technical progress, as measured by the evolution of the manufacturing total factor productivity, and financial development is a long-run relationship, in consistency with Schumpeter's conjecture that views the incremental flows in the financial sector as essential in economic development. Samargandietal. (2015) find the existence of an inverted U-shaped relationship between economic growth and financial development, an excessive amount of finance might having a negative influence on growth for

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middle-income countries. Bahri et al. (2018) reveal that financial development has a nonlinear relationship with FDI in the long-run, contributing to FDI inflows when financial development passes a threshold level at 70 points. Solomon (2011) concludes that the financial development and also the quality of economic policy insignificantly affect the relationship between FDI and growth. By contrast, Law & Singh (2013), find that more finance isn't always good for economic growth if the financial development exceeds the threshold, and an "optimal" level and efficient channeling of financial resources are more important for growth.

3. Methodology and data

3.1 Data

Using annual data for countries of Central and Eastern Europe (Bulgaria, Czech Republic, Poland, Hungary, and Romania) over the period from 1996 to 2019, we want to identify the determinants of FDI inflows. The five CEE economies have similarities in culture and geographical proximity, their fast economic growth during the last 10 years, and plenty of researches confirm that net inflows of foreign direct investment were the engine of economic growth in Central and Eastern Europe. Blonigen et al. (2007) conclude that the spatial interdependence and the traditional determinants of FDI inflows are quite sensitive to the sample of economies examined in trying to argue different motivations for attracting FDI.

The data for the inward FDI flows (% GDP) and trade openness is provided by UNCTAD, while the data for the remaining variables are taken from the World Bank dataset, Eurostat, IMF.

In terms of the variables, real GDP per capita is in constant US dollar, FDI, OPEN, and FINDEV are as a percentage share of GDP.LABOR represents the compensation of employees as a percentage of GDP, as a proxy for labor cost of each developing countries, and is expected to have a negative impact on FDI flows, foreign investors been attracted by the cheap labor. Real GDP per capita is the proxy for the host countries' market scope and size and using GDP per capita instead of nominal GDP in US dollar or PPP terms could produce less robust results, because the dependent variable is the ratio of inwards FDI flows to nominal GDP. The level of economic growth is one amongst the factors that attract foreign capital, the richest countries generally receiving more FDI and also the level of financial development is higher in those countries. Following the studies undertaken by Alfaro et al.(2002), Law and Singh (2014),Bahri et al. (2018), for financial development we used domestic credit to private sector as a percentage share of GDP. Trade openness is measured in terms of the ratio of exports and imports of goods and services to GDP and is a proxy for the countries' economic openness, having a positive impact on the FDI. The ratio of the sum of exports and imports to GDP is the most used proxy

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for trade openness due to the data availability for all countries. Additionally, we include inflation rate and we used the Consumer price index 2010 as a proxy for the inflation. We choose also to consider inflation because higher volatility of inflation has a detrimental effect on the economy reflecting a higher degree of macroeconomic instability. The model also includes RER as the real effective exchange rate, as a proxy for the evolution of the links between monetary policy and international competitiveness. All data are converted into natural logarithms.

3.2 Empirical methodology

Panel data has more advantages than cross-section or pure time-series data, such as controlling individual heterogeneity or identifying and measuring the effects that are not detectable in time-series or cross-country estimations. In the case of cross-section and time-series data, the correlation between the error term, and the regressors exists and as a result, it could obtain biased results. According to Hsiao (2007), in panel data analysis, the unobservable growth determinants that are country-specific, can be acknowledged and included in the estimation procedure. Besides, the country-specific determinants of FDI inflows may provide further insight into ulterior growth determinants that are undetectable in the time-series data (De Mello, 1999).

To identify the factors that determine the FDI inflows in a panel, we use the following equation:

$$lnFDi_{it} = \alpha_1 lnFINDEV + \alpha_2 lnGDP + \alpha_3 lnINF + \alpha_4 lnOPEN + \alpha_5 lnLABOR_{it} + \alpha_6 lnREER_{it} + u_{it} \quad (1)$$

Using panel data which tend to be non-stationary at level, it's very important to test for the presence of unit roots and to determine the order of integration.

In this study, we performed panel unit root tests, proposed by the Augmented Dickey-Fuller (ADF), Levin, Lin and Chu (LLC) and Im, Pesaran and Shin (IPS). Although these tests are theoretically named "panel unit root", they are only multiple-series unit root tests applied to panel structures, where the presence of cross-sections produces "multiple series" out of one series.For every variable used in the econometric model, all three tests aim to work out the order of integration or the number of the difference applied in order to obtain the stationarity variable.

The panel cointegration test proposed by Pedroni takes their starting point by the following regression:

$$y_{1it} = \alpha_i + \beta_i x_{2\,it} + \epsilon_{i,t}, \quad (2)$$

where the scalar $y_{1it}$and $x_{2\,it}$ are country specific variables, i=1,…N and t=1, ..T. Under the null hypothesis of no cointegration among variables, the residuals $\epsilon_{i,t}$must be I(1).If the null

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hypothesis is rejected then we conclude that the variables are cointegrated for at least one country from the panel. The cointegration is estimated individually for each *i* and the residuals are then tested for unit roots where the parameter of interest is $\gamma_i$in the following regression:

$$\widehat{\omega}_{i,t} = \gamma_j + \gamma_i \widehat{\omega}_{i,t-1} + \sum_{j=1}^{p_i} \theta_{i,j_i} \Delta\widehat{\omega}_{i,t-j} + \varepsilon_{i,t}, \qquad (3)$$

The Pedroni test specifies seven statistics, four of them are panel statistics, capturing the within-dimension effects, and three of them are group statistics, capturing the between-dimension effects by pooling the AR coefficients across cross-sections. We also use Kao test for robustness. The Kao cointegration test follows the same approach used in the Pedroni testbut specifies cross-section specific interprets and homogenous coefficients, while the Pedroni test specifies cross-section specific interprets and heterogeneous intercepts.

After the results of the cointegration test, if there is evidence of a long-term relationship between the examined variables, we apply the panel Fully Modified Ordinary Least Squares (FMOLS) techniques to equation (1) above. The panel FMOLS estimator for the coefficient β for country *i* is represented as:

$$\hat{\beta}_i^* = \sum_{t=1}^{T} (X_i' X_i)^{-1} \sum_{t=1}^{T} (X_i' y_i^* - T\delta), \quad (4)$$

where *T* is the number of periods, y_i^* is the transformed variable and δ is the parameter adjusted for serial correlation.

The FMOLS estimators are extremely accurate, allowing for cross-sectional heterogeneity, endogeneity, and serial correlation dynamics (Pedroni, 2000).

In this paper, we applied the pooled panel fully modified OLS (FMOLS) technique, where the pooled estimators are based on the within dimension of the panel.Since the cointegration analysis does not confirm the direction of causality, so we have to use the panel Granger causality analysis to determine the long-run and the short-run relationships among the seven variables in the system.

The panel Granger causality test with a dynamic error correction is specified as follows:

$$\Delta LFDI_{it} = c_{1i} + \sum_{j=1}^{p} \alpha_{1ij} \Delta LFDI_{it-j} + \sum_{j=1}^{p} \beta_{1ij} \Delta LFINDEV_{it-j} + \sum_{j=1}^{q} \gamma_{1ij} \Delta LGDP_{it-j} + \sum_{j=1}^{q} \delta_{1ij} \Delta LINF_{it-j} + \sum_{j=1}^{q} \theta_{1ij} \Delta LOPEN_{it-j} + \sum_{j=1}^{q} \vartheta_{1ij} \Delta LLABOR_{it-j} + \sum_{j=1}^{q} \mu_{1ij} \Delta LREER_{it-j} + \psi_{1i} \varepsilon_{it-1} + u_{1it} \quad (5)$$

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$$\Delta LFINDEV_{it} = c_{2i} + \sum_{j=1}^{p} \alpha_{2ij}\, \Delta LFINDEV_{it-j} + \sum_{j=1}^{q} \beta_{2ij}\, \Delta LFDI_{it-j} + \sum_{j=1}^{q} \gamma_{2ij}\, \Delta LRGDP_{it-j} + \sum_{j=1}^{q} \delta_{2ij}\, \Delta LINF_{it-j} + \sum_{j=1}^{q} \theta_{2ij}\, \Delta LOPEN_{it-j} + \sum_{j=1}^{q} \vartheta_{2ij}\, \Delta LLABOR_{it-j} + \sum_{j=1}^{q} \mu_{2ij}\, \Delta LREER_{it-j} + \psi_{2i}\varepsilon_{it-1} + u_{2it} \quad (6)$$

$$\Delta LGDP_{it} = c_{3i} + \sum_{j=1}^{p} \alpha_{3ij}\, \Delta LGDP_{it-j} + \sum_{j=1}^{p} \beta_{3ij}\, \Delta LFINDEV_{it-j} + \sum_{j=1}^{q} \gamma_{3ij}\, \Delta LFDI_{it-j} + \sum_{j=1}^{q} \delta_{3ij}\, \Delta LINF_{it-j} + \sum_{j=1}^{q} \theta_{3ij}\, \Delta LOPEN_{it-j} + \sum_{j=1}^{q} \vartheta_{3ij}\, \Delta LLABOR_{it-j} + \sum_{j=1}^{q} \mu_{3ij}\, \Delta LREER_{it-j} + \psi_{3i}\varepsilon_{it-j} + u_{3it} \quad (7)$$

$$\Delta LINF_{it} = c_{4i} + \sum_{j=1}^{p} \alpha_{4ij}\, \Delta LINF_{it-j} + \sum_{j=1}^{p} \beta_{4ij}\, \Delta LFINDEV_{it-j} + \sum_{j=1}^{q} \gamma_{4ij}\, \Delta LFDI_{it-j} + \sum_{j=1}^{q} \delta_{4ij}\, \Delta LGDP_{it-j} + \sum_{j=1}^{q} \theta_{4ij}\, \Delta LOPEN_{it-j} + \sum_{j=1}^{q} \vartheta_{4ij}\, \Delta LLABOR_{it-j} + \sum_{j=1}^{q} \mu_{4ij}\, \Delta LREER_{it-j} + \psi_{4i}\varepsilon_{it-j} + u_{4it} \quad (8)$$

$$\Delta LOPEN_{it} = c_{5i} + \sum_{j=1}^{p} \alpha_{5ij}\, \Delta LOPEN_{it-j} + \sum_{j=1}^{p} \beta_{5ij}\, \Delta LFINDEV_{it-j} + \sum_{j=1}^{q} \gamma_{5ij}\, \Delta LFDI_{it-j} + \sum_{j=1}^{q} \delta_{5ij}\, \Delta LGDP_{it-j} + \sum_{j=1}^{q} \theta_{5ij}\, \Delta LINF_{it-j} + \sum_{j=1}^{q} \vartheta_{5ij}\, \Delta LLABOR_{it-j} + \sum_{j=1}^{q} \mu_{5ij}\, \Delta LREER_{it-j} + \psi_{5i}\varepsilon_{it-j} + u_{5it} \quad (9)$$

$$\Delta LLABOR_{it} = c_{6i} + \sum_{j=1}^{p} \alpha_{6ij}\, \Delta LLABOR_{it-j} + \sum_{j=1}^{p} \beta_{6ij}\, \Delta LFINDEV_{it-j} + \sum_{j=1}^{q} \gamma_{6ij}\, \Delta LFDI_{it-j} + \sum_{j=1}^{q} \delta_{6ij}\, \Delta LGDP_{it-j} + \sum_{j=1}^{q} \theta_{6ij}\, \Delta LINF_{it-j} + \sum_{j=1}^{q} \vartheta_{6ij}\, \Delta LOPEN_{it-j} + \sum_{j=1}^{q} \mu_{6ij}\, \Delta LREER_{it-j} + \psi_{6i}\varepsilon_{it-1} + u_{6it} \quad (10)$$

$$\Delta LREER = c_{7i} + \sum_{j=1}^{p} \alpha_{7ij}\, \Delta LREER_{it-j} + \sum_{j=1}^{p} \beta_{7ij}\, \Delta LFINDEV_{it-j} + \sum_{j=1}^{q} \gamma_{7ij}\, \Delta LFDI_{it-j} + \sum_{j=1}^{q} \delta_{7ij}\, \Delta LGDP_{it-j} + \sum_{j=1}^{q} \theta_{7ij}\, \Delta LINF_{it-j} + \sum_{j=1}^{q} \vartheta_{7ij}\, \Delta LOPEN_{it-j} + \sum_{j=1}^{q} \mu_{7ij}\, \Delta LLABOR_{it-j} + \psi_{7i}\varepsilon_{it-1} + u_{7it} \quad (11)$$

The coefficients α, β, δ, θ, ϑand μare the short-run dynamic coefficients of the model's convergence to long-run equilibrium and ψ is the speed of adjustment.

4. Results

4.1 Descriptive statistics and panel unit root test

Transforming the values of all real variables(FDI, FINDEV, GDP, INF, OPEN, LABOR, REER) into their logarithmic values, the fluctuations of the four variables are considerably diminished.

Table 1 provides a summary of the descriptive statistics of variables used for panel data during 1996-2019.

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Mean values of all variables are positive where the mean value for LGDP is the highest at 9.22 while the lowest mean value is LFDI at 1.48. Also, LFDI has the highest gap between maximum and minimum compared with the other variables, as well as the standard deviation which is far apart from others. That could imply that LFDIhas some upwards outliers. The median for LGDP and LFDI is 9.2% and 1.3%, respectively. The results of the Jarque-Bera test for normality test show that only LGDP and LOPEN are normally distributed.

Table 1. Descriptive statistics

Variables	LFDI	LFINDEV	LGDP	LINF	LOPEN	LLABOR	LREER
Mean	1.48	3.50	9.22	4.34	4.63	2.23	4.48
Median	1.33	3.62	9.20	4.48	4.68	2.25	4.54
Maximum	4.00	4.23	10.08	4.82	5.13	2.55	4.72
Minimum	-0.65	1.96	8.24	1.28	3.91	1.68	3.78
Std. Dev.	0.82	0.56	0.47	0.58	0.32	0.16	0.16
Skewness	0.68	-0.99	-0.17	-3.31	-0.39	-0.69	-1.45
Kurtosis	4.27	3.19	2.16	16.26	2.14	3.74	5.41
Jarque–Bera	16.38	18.98	3.87	1043.95	6.51	11.58	67.35
Probability	0.00	0.00	0.14	0.00	0.04	0.002	0.00

We execute a unit root stationarity test on panel data to examine the order of integration of each series and then use the cointegration test, in order to test the causality among the seven variables in this research. If these variables are cointegrated, we must examine the short and the long-run Granger causality using vector error correction models (VECM), instead of a VAR model.Several tests will be performed, such as Levin and Lin (LLC) unit root test, Im-Pesaran-Shin (IPS) test, and the Augmented Dickey-Fuller (ADF) testto determine the order of integration of these seven variables. For the null hypothesis (H0), the panel data is stationary if the p_value is less than 10% and its alternative hypothesis is nonstationary.

According to LLC test, IPS test, and ADF test, at the 1% level of significance, LFDI, LFINDEV, LINF, LLABOUR, and LREER are stationary and are integrated as zero, I(0). The real LGDP and LOPEN are not stationary and therefore, we have proceeded to the differentiation of order 1

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of these series and the results show that these series are stationary of 1 order, I(1), meaning that they do not have a unit root, as shown in Table 2.

Table 2. Panel Unit Roots tests

Variables	LLC	IPS	ADF	Variables	LLC	IPS	ADF
LGDP	-0.38	2.67	1.53	D_LGDP	-5.43***	-5.49***	47.26***
LFDI	-3.28***	-3.25***	31.90***	D_LFDI	-7.19***	-8.77***	76.09***
LFINDEV	-5.50***	-3.14***	29.99***	D_LFINDEV	-12.09***	-9.24***	92.55***
LINF	-7.49***	-6.43***	57.77***	D_LINF	-43.24***	-38.10***	318.11***
LOPEN	-1.56*	-1.14	15.61	D_LOPEN	-7.08***	-6.02***	52.64***
LLABOR	-3.10***	-3.49***	35.40***	D_LLABOR	-6.279***	-5.767***	50.43***
LREER	-2.64**	2.57*	23.21*	D_LREER	-6.17***	-6.08***	53.32***

Note: The symbol ***,**,* denotes significance at 1, 5 or 10% level. Individual intercept.

4.2 Panel Cointegration Tests

Now if we showed that the series is stationary of 1 order, I(1), we can perform several panel cointegration tests such as Pedroni (1999,2004) and Kao, in order to examine the long-run relationships among these variables. The Pedroni and Kao panel cointegration tests are based on the Engle-Granger two-step (residual-based) tests.

If there are at least four of seven test statistics in the Pedroni test with values of probability under the selected significance level, the null hypothesis of no cointegration relationship can be rejected. Maximum lag length in the equations is automatically selected, using Schwarz Info Criterion. We applied Newey-west automatic bandwidth selection and Bartlet kernel.

Table 3 presents the results of the Pedroni panel cointegration tests and there are four different statistics that reject the null hypothesis of no cointegration among the variables at1%, 5%, and 10% significance levels. Therefore, the evidence supports that the variables are cointegrated and the presence of a long-term equilibrium relationship among FDI, financial development, trade openness, inflation, labor force, and real effective exchange rate.

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Table 3.Pedroni (2004) panel cointegration results

	Model : LFDI, LFINDEV, LGDP, LINF, LOPEN, LLABOR, LREER	
	Statistic	Weighted Statistic
Within dimension		
Panel *v*	-2.04	-3.02
Panel *þ*	1.64	1.49
Panel PP	-3.58***	-6.50***
Panel ADF	-3.32***	-4.92***
Between dimension		
Group *þ*	2.47	
Group PP	-3.58***	
Group ADF	-2.31*	

Note: (i) Trend assumption: Deterministic intercept and trend;
(ii) Automatic lag length selection based on SIC with lags from 1 to 3; (iii) The symbol ***,**,* denotes significance at 1, 5 or 10% level.

The Kao cointegration test presents the same results for all variables as those obtained in Pedronipanel test.Table 4 exhibits the results of the Kao panel cointegration test under the assumption of no deterministic trend. For a 1% level of significance, there is a valid cointegration relationship between the variables, implying the presence of a long-run relationship among the regressors.

Table 4. Results from Kao Panel Cointegration Test

Model:	ADF t-statistic	Prob.
LFDI, LFINDEV, LGDP, LINF, LOPEN,LLABOR, LREER	-2.39***	0.008

Note: (i)The symbols *, ** and *** denote significance at the 10, 5 and 1% levels and k is the number of regressors. (ii)Trend assumption: no deterministic trend

4.3 Panel cointegration regression

In order to obtain a clear image of the cointegration relationships between FDI and other macroeconomic variables in developing countries from CEE, we employed in this study the pooled Fully Modified OLS (FMOLS) method and the results are presented in Table 5. In pooled FMOLS estimation coefficient of covariance is computed using the sandwich method. The within estimation eliminates the persistent differences between countries over the entire period, allowing to take into account the heterogeneity of individuals in their temporal dimension.

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Table 5 reports that real GDP per capita, trade openness, and labor cost having positive and significant impacts on FDI inflows at 1% and 10% significant level in FMOLS estimation. As expected, the real GDP per capita is highly significant in FMOLS estimation, meaning that a 1% increase in the real GDP increases the share of FDI inflows by 4.22% in CEEs, *ceteris paribus*.This result is consistent with the finding of Bevan & Estrin (2000), Neuhaus (2006),Boateng et al. (2015), Ramirez (2019),who also suggested that economic growth tends to attract further foreign investors who prefer market-seeking in order to locate their companies to the recipient countries. Furthermore, the foreign investment decisions depend not only the existing market potential of the host country but also on the expected size and potential growth of the market in the long-run. Our results show that the degree of a recipient country's trade openness is significant positive to FDI inflows in FMOLS estimation, indicating that the larger the weight of imports and export in the GDP of the host country, the more it seems able to absorb FDI flows. In newly opening transition economies, future foreign investors may become more informed of existing local conditions from trade in goods and services and more encouraged to invest in the host country they know better (Campos &Kinoshito, 2003).

This finding is in line with the existing results obtained by Dellis (2017),Boatenget al. (2015), Liu et al. (2001).The labor cost is positive and significant at a 10% level, suggesting that a 1% increase in labor cost increases the share of FDI inflows in GDP by 0.95%, *ceteris paribus*. Further, the variable labor cost affects positively the foreign direct investment inflows into developing countries, also supported by the findings reported by Lipsey (2002). Foreign investors are concerned about labor cost when the wage levels are already high, suck as in the developed countries (the compensation of employees was 1138 billion EURO for Euro Area in 2019) and, when they are looking to reduce the cost with labor force by relocating production activity to the developing countries where resources are already at a lower cost (250 billion EURO for five countries selected in this study from CEE in 2019).With regard to the real exchange rate, the results indicate no significant impact on FDI in FMOLS estimation. The price for goods and services is not significantly related to FDI in CEE countries, in contradiction to the finding by Bahri et al. (2018).Turning to the domestic credit to private sector variable as a proxy for the financial development, it can be seen that it has no impact on FDI inflows, meaning that the effect of FDI on economic growth does not depend on the level of financial development of the host country. These findings in this paper are in line with other surveyed studies (Jude, 2017; Solomon,2011). Particularly for CEEs, it may be concluded that the inward FDI flows are explained mainly by the market size, trade openness, and labor cost.

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Table 5. Panel long-run estimates

Dependent VariableFMOLS LFDI	
LFINDEV	0.13
LGDP	4.22***
LOPEN	1.63***
LINF	-0.11
LLABOR	0.95*
LREER	-0.21
R-squared	0.62
Jarque-Bera	2.45

Notes: (i) Panel method using pooled estimation; (ii) Bartlett kernel and Newey-West fixed bandwidth; (iii) The symbol ***,**,* denotes significance at 1, 5 or 10% level.

4.4. Granger causality

Because all the variables are cointegrated, we proceed to analyze the short-run Granger causality within the ECM framework based on Equation (1). The results of PVECM Granger causalities are shown in Table 5.

In the short-run, the F-statistics on the explanatory variables suggest that there is a bi-directional Granger causality among real GDP and labor cost in CEE countries. This implies that an increase in the quality of human capital leads to economic development, labor cost being a major factor in terms of economic growth. Results of Granger causality reported in Table 6 show bidirectional causal links between real GDP and INF, among financial development and labor cost, between INF and REER and among inflation and FDI. There's no significant Granger causality from FDI to financial development and economic growth in the short-run in developing countries. Also, there is a one-way causal link running from trade openness to real GDP or from real GDP to exports and imports.

In the long-run term, if the ECT is negative and statistically significant, we can discuss the long-run causality. Therefore, in the long-run, we acknowledge bidirectional causality between economic growth and inflation, as well as a bidirectional causal relationship between FDI and inflation, and between real exchange rate and inflation. Also, in the long term, we identify a one-

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way causal link from financial development to economic development and to labor cost and, a one-way unidirectional causal link running from labor cost to financial development. As well as, we acknowledge a one-way causal relationship from the market size, inflation, trade openness, and labor to FDI.

Table 6. Results panel vector error-correction model Granger causalities

Dependent variables	Independent variables						
	ΔLFDI	ΔLFINDEV	ΔLGDP	ΔLINF	ΔLOPEN	ΔLLABOR	ΔLREER
ΔLFDI	-	0.78	1.89	5.63*	3.32	1.08	1.20
ΔLFINDEV	0.39	-	9.50***	3.16	0.37	4.65*	4.18
ΔLGDP	7.42**	1.73	-	16.40***	3.95	10.92***	0.87
ΔLINF	10.01***	2.55	7.11**	-	7.38**	2.68	10.67***
ΔLOPEN	8.05**	1.65	19.94***	3.94	-	0.22	9.62***
ΔLLABOR	4.62*	11.41***	7.19**	2.89	8.72**	-	8.22**
ΔLREER	0.22	8.63**	0.95	9.84***	1.08	2.32	-
ECT	-0.18**	0.008	-0.01***	-0.009**	-0.03***	-0.015***	0.017***

Note: The symbols *, ** and *** denote 10, 5 and 1% significance level. The number of lags we use 2.

5. Conclusions

The object of this study was to develop an empirical econometric framework to identify the potential determinants of FDI inflows in transition economies from Central and Eastern Europe. Using panel data for five Central and Eastern European countries for the period 1996-2019, this paper examined the relationship between FDI and economic growth, labour, financial development, inflation rate, trade, and also the real effective exchange rate. The quantitative outcomes of FMOLS confirmed that market size, trade openness, and labor cost are the major determinants of FDI in CEEs. On the other hand, developing countries don't need better developed financial markets in FDI-growth nexus. The most important implication of these econometric results of this research is to use the compensation of employees as the proxy for labor cost. The empirical analysis on CEEs data reveals that the compensation of employees as a share of GDP has a positive impact on FDI inflows and is statistically significant. This implies that higher wage levels increase foreign capital into transition economies, one of the positive spillovers of foreign companies in host countries, by offering higher wages for qualified labor force who can adopt advanced technology easily. Foreign multinationals are concerned about

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labor cost when the home country wage levels are already high, suck as in the developed countries, and when they are looking to reduce the cost with the labor force by relocating production activity to the developing countries where human resources are already at a lower cost. Continuous increase of FDI stocks as percentage of GDP in Bulgaria, Czech Republic, Hungary, Poland, and Romania in the last two years indicated that these countries had maintained their attractiveness for investors.

Furthermore, the panel vector error-correction model Granger causalities provided evidence for a short-run bidirectional causal relationship between the real GDP and inflation, among financial development and labor cost, between inflation and REER, and among INF and FDI inflows. Also, the long-run two-way causal links between FDI and inflation, among economic growth and inflation, and between the real exchange rate and inflation were established.

Hence, in terms of policy recommendations, the policymakers must implement some reforms to improve the market size, trade openness, and labor cost to increase inward FDI into CEEs. Various incentives must be offered to foreign investors, like governmental non-reimbursable grants for the asset purchases, incentives in the form of interest reductions to investors for investment loans or state guarantees, or incentives for the new workplaces created in the host country.

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