IMPACT OF OWNERSHIP-LOCATION-INTERNALIZATION (OLI) PARADIGM AND INVESTMENT DEVELOPMENT PATH (IDP) ON GRAVITY MODEL OF FOREIGN DIRECT INVESTMENTS IN EASTERN EUROPE AND CENTRAL ASIA (EECA) REGION

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Abstract: *This study investigates the impact of OLI paradigm and the IDP on the gravity model of FDI in EECA region. Using panel data from 1995 to 2017, the analysis employs POLS, Fixed Effects, and Random Effects estimation methods to examine the determinants of FDI inflows. The results highlight the significance of the receiving country's GDP and labour market quality as the most consistent and statistically significant factors influencing FDI inflows. The distance between source and receiving countries also exhibits a negative relationship with FDI flows. Other variables, such as the source country's GDP, tertiary education, institutional governance, taxation, infrastructure, foreign exchange rates, and labour costs, do not show consistent or statistically significant effects across the estimation methods. The Fixed Effects model demonstrates the highest explanatory power, suggesting its suitability for capturing the variation in FDI inflows. These findings contribute to understanding the determinants of FDI and provide insights for policymakers and investors. Countries aiming to attract FDI should focus on promoting economic growth, improving labour market conditions, and reducing perceived distances between source and receiving countries.*

Keywords: *FDI, gravity model, OLI paradigm, EECA, panel data analysis*

JEL Classification: C23, F21, F41

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Introduction

The study of Foreign Direct Investment (FDI) has long attracted attention of international economics, with various theoretical frameworks developed to explain the drivers and patterns of investment flows across borders. FDI has been a key driver of economic growth and development of many former Union of Soviet Socialist Republic (USSR) states, some of which after the dissolution of the USSR formed a regional intergovernmental organization Commonwealth of Independent States (CIS) whose economic growth has been boosted by FDI since the region's transition from centrally planned to market-oriented economies. These states are located in Eastern Europe and Central Asia (EECA) region. Latvia, Lithuania, Estonia refused to join CIS, Georgia and Ukraine are not member states as of May 2024. Understanding the determinants, causalities and patterns of FDI in this region is essential for policymakers, international organisations and investors alike. The ownership-location-internalization (OLI) paradigm and the investment development path (IDP) are two influential frameworks that have been widely used to provide comprehensive explanations of why firms invest abroad and how countries evolve in their roles as recipients and sources of FDI. These theories have been examined through the lens of the gravity model of FDI, which posits that investment flows are largely determined by the economic size and distance between countries.

The OLI paradigm, also known as the eclectic paradigm, developed by Dunning (1977), notes that hat firms engage in FDI when they possess ownership advantages (such as proprietary technology or brand reputation), can benefit from location advantages in host countries (such as lower production costs or access to resources), and can internalize their operations to reduce transaction costs. The IDP framework, on the other hand, offers a dynamic view of how countries progress through different stages of FDI involvement based on their level of economic development. It suggests that countries initially act as net recipients of FDI, attracting investment from more developed economies. As they develop, these countries gradually become net exporters of FDI, investing in other regions. This progression is influenced by changes in economic structure, competitiveness, and policy environment.

The gravity model of FDI, inspired by Newtonian physics, provides a quantitative approach to analysing investment flows. It is based on the gravity model of international trade, suggests that FDI flows between two countries are

positively related to their economic size and inversely related to the distance between them. This model has been widely used in empirical studies of the determinants of FDI, but its relationship with the OLI paradigm and IDP has not been fully explored in the EECA region.

In the context of EECA, the region characterized by rapid economic transformation and diverse cultural, language and investment landscapes, understanding the interplay between the OLI paradigm, IDP, and the gravity model of FDI is crucial. EECA region has experienced significant shifts in economic policies, market liberalization, and integration into the global economy, making them attractive destinations for FDI. However, the extent and nature of these investments vary widely, influenced by country-specific factors and regional dynamics.

This paper aims to answer the research question: *"How does the ownership-location-internalization (OLI) paradigm and the investment development path (IDP) relate to the gravity-type model of foreign direct investments (FDI) in ECCA states before 2017?"* We aim to bridge this gap by analysing the impact of the OLI paradigm and IDP on the gravity model of FDI in EECA countries. By examining how the ownership, location, and internalization advantages of the OLI paradigm and the stages of the IDP affect the economic size and distance factors emphasized in the gravity model, affect FDI flows within the framework of the gravity model, this study seeks to provide a more comprehensive understanding of the drivers and patterns of FDI in the region. The findings of this research are expected to have implications for policymakers in EECA countries seeking to attract FDI and promote economic development. By understanding how the OLI paradigm and IDP interact with the gravity model of FDI, policymakers can design more effective policies and strategies to enhance their countries' attractiveness to foreign investors. Moreover, this study contributes to the academic literature by integrating different theoretical frameworks and providing new insights into the determinants of FDI in the EECA region.

We conducted research on a sample of eight high-income countries that are members of the Organisation for Economic Co-operation and Development (OECD). This group includes early European Union members: Austria, Denmark, France, Germany, the Netherlands, Italy, Spain, and Sweden. Additionally, we selected eight countries from the Eastern Europe and Central Asia (EECA) region, specifically Armenia, Azerbaijan, Georgia, Kazakhstan, Moldova, the Russian Federation, Ukraine, and Turkey.

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Based on data sourced from Bloomberg Terminal, we constructed panel datasheet with 1 932 observations with the observed time period between 1995 and 2017, i.e. 22 years. We performed statistical modelling by using a combination of Pooled Ordinary Least Squares (POLS) regression, Fixed Effect and Random Effect regression.

It is important to emphasize that due to significant socio-economic and geopolitical shocks, such as the COVID-19 pandemic and the military conflict in Ukraine that began in February 2022, this paper focuses on the prevailing conditions in EECA before 2017. Analysing data from before these events helps avoid skewing the results and provides a clearer picture of the region's baseline conditions.

The paper is structured as follows. Section 2 presents a literature review on the determinants of FDI in EECA region and examines the relationship between the OLI paradigm and the IDP within the context of the Gravity Model of FDI. Section 3 discusses the methodology: sub-section 3.1 defines a subject of research, i.e. eight high-income EU countries and eight countries from the EECA region. Sub-section 3.2 describes the data used. The econometric methods are detailed in subsections 3.3, covering the Pooled Ordinary Least Squares (POLS) estimator, the Fixed Effects (FE) estimator and the Random Effects (RE) estimator. Econometric model along with its key and other variables in 3.4. Section 4 presents the results. Finally, Section 5 concludes the paper.

2 Literature review

2.1 Determinants of FDI in Eastern Europe and Central Asia region

It is crucial to highlight that this paper focuses on the prevailing conditions in the EECA region before 2017 in order to avoid potential data distortions caused by significant socio-economic and geopolitical shocks which followed in upcoming years. By excluding these periods of substantial upheaval from the analysis, the paper aims to provide a more accurate representation of the region's typical FDI determinants, preventing the skewing of results that could occur if these extraordinary events were considered.

The environment and determinants of foreign direct investments (FDI) in the Eastern Europe and Central Asia (EECA) region, which includes countries

which are subjects of our analysis, in particular Armenia, Azerbaijan, Georgia, Kazakhstan, Moldova, the Russian Federation, Ukraine, and Turkey, before 2017 were shaped by each country's unique mix of political stability, economic reforms, natural resource wealth, market potential, and sectoral growth opportunities. Political and economic reforms, efforts to combat corruption, and improving regulatory frameworks were crucial factors in enhancing the investment climate across the region, all varying significantly across the countries which are subject to analysis. Economic growth and market potential played a significant role in attracting FDI, with larger economies like Turkey and Russia being particularly attractive destinations for market-seeking investments. Natural resource endowments, especially in the oil and gas sectors, were crucial determinants of FDI in countries such as Russia, Kazakhstan, and Azerbaijan, which attracted substantial resource-seeking investments.

Several authors studied FDIs flowing to EECA region. Popescu (2014) emphasizes political stability as the first and the most important factor for determining factor for attracting FDI as countries with stable political systems and low levels of corruption are more attractive to foreign investors, as they provide a favourable climate for business operations. Mateev and Tsekov (2012) conclude that the most important macroeconomic and political risk factors that attract FDI flows to both Western European countries (EU-15) and EECA are trade openness, infrastructure quality and country risk. Secondly, EECA countries need to focus more on maintaining competitive tax rates and labour costs to attract FDI. Traditional location factors like GDP per capita and distance have a statistically significant effect on FDI inflows. In addition, Mateev and Tsekov (2012) emphasize the importance of institutional and political factors. To name the most important ones such control of corruption, government effectiveness and regulatory quality. Political stability plays a more significant role in attracting FDI to CEECs than to EU countries. Many other authors have investigated the role of various factors in FDI in CEECs. These factors can be grouped into different categories, such as transition-specific factors by Carstensen and Toubal (2004), economic development by Henriot (2005), economic reforms by Stoian and Vickerman (2005), and exchange rate regimes by Aubin et al. (2006). Countries that are geographically close to major markets, such those in (Western) Europe and Asia, have a strategic advantage in attracting foreign investors who seek to access these markets as Bekmurodova (2020) adds. Moreover, some of EECA countries possess

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significant quantities of natural resources, such as oil, gas, minerals, and agricultural products, can attract foreign investors seeking to exploit these resources (Mensah and Traore, 2024).

In conclusion, the determinants of FDI in the Eastern Europe and Central Asia region encompass political stability, economic and infrastructure development, natural resource availability, market access and proximity to major markets, the presence of a skilled labour force, economic policies, regulatory frameworks, corruption levels, ease of doing business, the legal and regulatory environment, protection of intellectual property rights, and government-provided investment incentives.

2.2 Relation of the OLI Paradigm and the IDP within the Gravity Model of the FDI

The OLI paradigm, also known as the eclectic paradigm, has been extensively studied by numerous authors since its introduction by John Dunning (1977). The paradigm has become a key framework for understanding the determinants of FDI and the international activities of multinational enterprises (MNEs). There have been many contributions to the development of the OLI paradigm. The most important ones were still performed by Dunning himself in the following years (Dunning, 1988; Dunning, 1993; Dunning, 2000; Dunning, 2001) who extended the OLI paradigm by incorporating new framework to various contexts, such as the investment development path and the role of MNEs in economic development, role of MNOs. Cantwell (1989) and Cantwell (1995) explored the technological aspects of the OLI paradigm, emphasizing the role of innovation and knowledge in the international activities of MNEs. Particularly relevant to IDP is extension by Narula (1996) and Narula (2010) who extended the application of the OLI paradigm to the study of FDI in developing countries, highlighting the importance of location-specific factors and the role of government policies in attracting FDI.

A domestic company's motivation to invest in a foreign company arises when it anticipates benefits from its assets. Dunning and Lundan (2008) explain that ownership-specific advantages refer to unique assets or those obtained under favourable market conditions. They further elaborate on location-specific advantages, which positively impact all participants and stem from economic, political, and cultural factors. The authors also mention internalization

advantages, which are benefits derived from the organizational and hierarchical control of international activities.

Outward investments tend to flow more towards neighbouring or relatively close countries according to Dunning and Lundan (2008), resulting in a negative impact of distance on FDI in the gravity-type model. The IDP, a dynamic approach following the OLI paradigm, suggests that as a country develops, its OLI advantages change, attracting FDI into different areas and sectors as per Dunning (2001). The IDP consists of five stages. In the early stages, Dunning and Narula (1997) note the focus is primarily on natural resources, with a lack of value-added activities and L-advantages, and inward investments dominate outward investments. The country has little to offer in terms of attracting FDI. It is characterized by low GDP per capita, a poor business environment, and corruption. Outward FDI may exist at a trivial level. During the second stage, inward FDI begins to increase, while outward FDI remains at a low level. The country starts to develop some attractive features for foreign investors. Dunning and Narula (1997) highlight a critical turning point where the growth rate of inward FDI declines, and subsequently, outward FDI starts to rise. This increase in outward FDI contributes to a rise in operating income for the country. In the fourth stage, outward FDI surpasses the inward FDI flow and continues to grow. The country's domestic companies have developed strong competitive advantages and are expanding internationally. In the final stage, both inward and outward FDI continue to increase until an equilibrium is reached. At this point, the level of net operating income is zero, as the inflows and outflows of FDI balance each other out. The country has reached a mature stage of economic development, with a strong presence in the global economy.

Ownership, location, and internalization advantages are the primary factors, or variables, that determine the level, form, and influence of FDI. Shimizu et al. (2004) discuss the motivations behind cross-border mergers and acquisitions (M&As), which are a form of FDI and suggests that a company is interested in undertaking overseas investment when certain benefits are present. Firstly, ownership advantages are internal factors of the company, such as multinational or local market experience and international strategy. These factors explain why the company should invest abroad. Dunning and Lundan (2008) summarize that these advantages refer to unique assets gained during favourable market conditions. Secondly, Shimizu et al. (2004) explains that location advantages include industry-level factors, such as production factors and sales force intensity. Lastly, internalization factors, also known

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as country-level factors, are corporate internal factors that include market growth in the host country and cultural factors. If the benefits derived from these three advantages are sufficiently high, the company will proceed with the investment.

Mathematically, gravity model as defined originally by Tinbergen (1962) of trade and FDI flow between two countries can be expressed as:

$$T_{ij} = A \times \frac{Y_i \times Y_j}{D_{ij}} \quad (1)$$

Where T_{ij} is trade or investment flow between countries I and j, A constant term capturing other factors that influence trade or investment flow, Y_i, Y_j are the economic sizes of countries i and j, typically measured by GDP or GDP per capita. D_{ij} is the distance between countries i and j, which can be geographical, cultural, or institutional.

The gravity model suggests that trade or investment flows between two countries are positively related to their economic sizes and negatively related to the distance between them. In other words, larger economies tend to have more trade or investment between them, while greater distances (geographical, cultural, or institutional) can slow or obstruct these flows.

The gravity model is in practice often used in logarithmic form predominantly due to: (i) linearization in order to simplify the estimation process, (ii) interpretation as elasticities representing percentage change, (iii) heteroscedasticity where the variance of the error term is not constant across observations, which can lead to inefficient estimates and invalid inference and, (iv) when dealing with nil FDI flows, a constant is added before taking the logarithm or employ alternative estimation techniques.

3 Data and Methodology

3.1 Subjects of research – selected EU and EECA countries

Countries with very similar economic performance and national wealth characteristics were targeted for both groups. The first group is comprising of early European Union members, specifically Austria, Denmark, France, Germany, the Netherlands, Italy, Spain, and Sweden, all of which are classified

as high-income countries by the World Bank (2024a). The second group of FDI host EECA countries includes Armenia, Azerbaijan, Kazakhstan, Moldova, and Russia, which are members of the Commonwealth of Independent States, a regional intergovernmental organization. Ukraine and Georgia are former members, while Moldova plans to withdraw its membership in 2024. Turkey holds a significant economic and political position in the region. According to the World Bank's income level classification, all EECA countries are considered upper-middle-income countries, with the exception of Ukraine, which is classified as a lower-middle-income country. However, for the purpose of this study, the World Bank's classification is followed. The main criterion for selecting this group was their very similar development in economic performance, measured by GNI per capita. EECA region is recognized for its investment potential and economic growth. However, these countries still lag behind developed nations in terms of Gross Domestic Product (GDP) per capita. This disparity highlights the ongoing challenges faced by the ECCA region in catching up with the economic output and living standards of more advanced economies. While the region's investment prospects and growth trajectory are promising, there remains a substantial gap in the overall economic development and prosperity between the EECA countries and their developed counterparts.

Table 1: Choice of countries subject to research

High-Income[2] EU Countries	**EECA Countries**	**World Bank Classification[3] of EECA Country by income level for 2024**
Austria	Armenia	Upper-middle income
Denmark	Kazakhstan	Upper-middle income
France	Moldova	Upper-middle income
Germany	Georgia	Upper-middle income
Netherlands	Azerbaijan	Upper-middle income
Italy	Russian Federation	Upper-middle income
Spain	Ukraine	Lower-middle income
Sweden	Turkey	Upper-middle income

Source: Own processing based on paper methodology

[2] World Bank (2024a).
[3] World Bank (2024b).

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According to UNCTAD (2024), FDI inflows into the Central Asian region saw a significant surge of 39 percent in 2023, reaching a total of $10 billion. Kazakhstan, in particular, experienced a remarkable growth in FDI, with inflows nearly doubling to reach $6.1 billion. This increase was primarily driven by investments in the extractive industries, which amounted to $4.1 billion, with major contributions coming from multinational enterprises (MNEs) based in the Netherlands and the United States. Meanwhile, Uzbekistan also witnessed an 11 percent rise in FDI inflows, reaching $2.5 billion.

3.2 Data

Using data obtained from the Bloomberg Terminal, a panel dataset was constructed, comprising 1 932 observations over a 22-year period from 1995 to 2017. The dataset includes information on 16 countries in total: eight high-income EU countries and eight EECA countries that are recipients of FDI. The panel data structure allows for the analysis of cross-sectional and time-series variations in FDI flows and their determinants across the selected countries. It is crucial to note that this paper concentrates on the prevailing conditions in Eastern Europe and Central Asia (EECA) prior to 2017 due to the occurrence of significant socio-economic and geopolitical shocks. These include the COVID-19 pandemic and the military conflict in Ukraine, which commenced in February 2022. By focusing on data from before these events, the study aims to provide a more accurate representation of the region's baseline conditions, unaffected by the potential distortions caused by these major disruptions. This approach ensures that the analysis and results are not skewed by the extraordinary circumstances that unfolded after 2017, allowing for a clearer understanding of the region's characteristics and trends under more typical circumstances.

Panel data possess a unique characteristic of incorporating both cross-sectional and time-series dimensions when collecting data on various factors, such as wages (Wooldridge, 2006). Panel data essentially combines cross-sectional and time-series data, allowing for the observation of a larger number of subjects over an extended period. As the number of observations increases, the estimation accuracy improves, enabling more reliable and precise analyses. Compared to time-series or cross-sectional regression, panel data regression provides a more realistic representation of the relationship between the dependent variable and independent variables, as defined by The US General

Accounting Office (2008). Panel data allows to investigate the dynamics of how the dependent variable responds and adapts to changes in the values of the independent variables over time. By observing the same subjects or entities across multiple periods, panel data provides insights into the temporal adjustment process and the lagged effects of the explanatory variables on the outcome of interest. This enables a more comprehensive understanding of the relationship between the dependent and independent variables, taking into account both the cross-sectional differences and the time-varying nature of the data.

3.3 POLS, FE and RE regression

To analyse the collected panel data, we construct three models using different statistical techniques: (i) Pooled Ordinary Least Squares (POLS) which treats panel data as a single cross-section, assuming a constant relationship between variables across individuals and time; (ii) Fixed Effects (FE) that enables for individual-specific effects correlated with independent variables, eliminating them by subtracting within-individual means and (iii) Random Effects (RE) which incorporates individual-specific effects uncorrelated with independent variables, treating them as random variables. These models employ different estimators, allowing for comparison and selection of the most appropriate approach based on data characteristics.
The fundamental structure of panel regressions as per Greene (2002) can be represented as follows:

$$y_{i,t} = \beta_1 x_{i,t1} + \beta_2 x_{i,t2} + \cdots + \beta_k x_{i,tk} + \mathrm{a}_1 z_{i1} + \mathrm{a}_2 z_{i2} + \cdots + \mathrm{a}_q z_{iq} + \mathrm{a}_{it} \quad (2)$$

We begin with POLS. To fully utilize the potential of panel data, it is necessary to employ a modified version of POLS formula. This modification takes into account the error components model, in which the POLS estimator is represented by the following equation:

$$y_{i,t} = \mathrm{x}_{it} + \alpha_i + \epsilon_{it} \quad (3)$$

POLS is a basic econometric model for panel data, applying Ordinary Least Squares (OLS) method. It represents the simplest approach, treating the panel data as a single cross-section. This straight approach overlooks the unique characteristics and complexities associated with the spatial and temporal

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dimensions inherent in pooled data. Relying solely on POLS as the only method for estimating panel data is often not recommended because it relies on the simplistic assumption that the variables exhibit identical behaviour across all individuals and time periods. This assumption fails to account for the potential heterogeneity and variability that may exist within the panel data.

The fixed effects (FE) estimator, also referred to as the least-squares dummy variable model, enhances the POLS estimation by assigning a dummy variable to each subject. This approach assigns a unique intercept β_{1i} to every subject, thereby helping to mitigate bias (Kennedy, 2008). The term "fixed" indicates that while the intercepts differ among subjects, they remain constant over time for each subject (Gujarati and Porter, 2009). Alternatively, applying the POLS method to the time-demeaned data (y_{it}-y_{iavg}) yields the same result as employing the fixed effects estimator (Wooldridge, 2006).

Verbeek (2012) describes the FE model as a linear regression model in which the intercept terms vary across individual units i:

$$y_{it} = \alpha_i + \acute{x}_{it}\beta + u_{it},\ u_{it} \sim IID(0, \sigma_u^2) \tag{4}$$

In this model, it is assumed that all x_{it} are independent of u_{it}. This can be reformulated within the general regression framework by incorporating a dummy variable for each unit in the model:

$$y_{it} = \sum_{j=1}^{N} \alpha_j d_{ij} + \acute{x}_{it}\beta + u_{it}, \tag{5}$$

where d_{ij}=1 if i=j and 0 otherwise. We therefore have a set of N dummy variable in the model. The parameters $\alpha_1,\ldots,\alpha_N$ and β can be estimated by OLS, the implied estimator for β is called the least squares dummy variable estimator.

Despite its advantages, the fixed effects method has two significant limitations. Firstly, it results in a loss of degrees of freedom, which can reduce the statistical power of the analysis. Secondly, it is incapable of incorporating time-invariant data, as the fixed effects estimator relies on within-subject variation. This means that variables that remain constant over time for each subject cannot be included in the model (Kennedy, 2008). Moreover, when using a large number of dummy variables, the fixed effects approach may suffer from multicollinearity, which can lead to imprecise estimates and inflated standard errors. Additionally, compared to the POLS method, fixed effects estimators exhibit greater variances, potentially reducing the efficiency of the estimates (Gujarati and Porter, 2009).

The random effects estimator (RE) addresses the mentioned shortcomings of the FE approach (Kennedy, 2008). Although it still accounts for varying intercepts across subjects, the RE estimator selects these intercepts randomly, resulting in a single overall intercept. As a result, the individual intercepts are represented as deviations or error terms from this mean value (Gujarati and Porter, 2009). This approach reduces the number of parameters that need to be estimated compared to the fixed effects model, making it more parsimonious (Asteriou and Hall, 2011).

By treating the individual-specific effects as random variables drawn from a common distribution, the RE estimator allows for the inclusion of time-invariant variables in the model. This is because the random effects model assumes that the individual-specific effects are uncorrelated with the explanatory variables, unlike the FE model. Furthermore, the RE approach is less prone to the loss of degrees of freedom, as it does not require the estimation of a separate intercept for each subject.

However, the RE model relies on the strict assumption that the individual-specific effects are independent of the explanatory variables. If this assumption is violated, the RE estimator may produce inconsistent and biased estimates. In such cases, the FE estimator is preferred, as it allows for correlation between the individual-specific effects and the explanatory variables.

To choose between the POLS and FE methods, a standard F-test can be employed. To decide between FE and RE, Asteriou and Hall (2011) suggests the Hausman test is appropriate. REs is more suitable when extracting a sample of observations from a large population and when there is assumed to be no correlation between the error component and the explanatory variables. Additionally, when the number of subjects is large and the number of time periods is small, random effects are preferred (Gujarati and Porter, 2009).

3.4 Model

We construct econometric model in order to examine the effects of the RER on FDI by using several independent variables. For the key independent variables see Table 2.

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Table 2: Variables of FDI Gravity Model

Variable Abbreviation	Variable Name
LOG_GDPS	Logarithm of GDP (economic growth and economy size) – source country
LOG_GDPR	Logarithm of GDP (economic growth and economy size) – receiving country
LOG_DIST	Logarithm of distance between source and receiving country
TERTEREDUC	Tertiary education in receiving country
FRDM_BUSSR	Freedom of business and institutional governance in receiving country sourced from Heritage Foundation
FRDM_LABORR	Quality of labour market sourced from Heritage Foundation
NETTAXPRODUCTSR	Taxation in receiving country by amount of levied sales tax
RAILSR	Total length of railways and roads in receiving country
FXS	Foreign exchange rate of source country
FXR	Foreign exchange rate of receiving country
GNIPR	Gross national income per capita, i.e. labour costs of receiving country
C	Coefficient of exchange rate of receiving country's currency

Source: Prepared by the author

In this paper constructed and used gravity-type model of FDI is based on its general form, as initially proposed by Anderson (1979) and subsequently modified by various authors. Of our particular interest are those extensions made by Gauselman, Knell and Stephan (2011), who observe that multinational enterprises operating in EECA countries are primarily attracted by low labour costs combined with educated and skilled workforce, as well as a growing market characterized by growing per capita income growth rates. These factors constitute the location advantages that draw FDI to these regions. Further elaborating on the location advantages that attract FDI, the literature Popovici and Călin (2012), Bellak Leibrecht and Liebensteiner (2010), Goodspeed,

Martinez-Vazquez and Zhang (2011) emphasizes the importance of several key factors. These include the quality of institutional governance, the level of taxation, the development of public infrastructure, and the characteristics of the labour market. These elements play a crucial role in determining the attractiveness of a country or region to foreign investors. By incorporating these location-specific factors into the gravity-type model of FDI, researchers aim to better understand and predict the patterns of international investment flows. The model takes into account not only the economic size and distance between countries but also the specific advantages that host countries offer in terms of labour costs, human capital, market potential, institutional quality, and overall business environment. This comprehensive approach allows for a more precise analysis of the determinants of FDI and helps to explain the observed variations in investment flows across different countries and regions.

In line with the discussed gravity-type model extensions, particular independent variables were incorporated into the model which are further specified in Table 2. The dependent variable of the model, which measures the impact on FDI, is the logarithmic form of the FDI flow between the high-income EU countries (FDI source) and EECA countries (FDI recipients).

Labour costs in the model are represented by the gross national income per capita in the host country, while education is represented by the share of tertiary graduates in the host country's labour force. The growth and volume of the market are captured by the logarithm of GDP for both the source and host countries. Fundamental institutional governance is examined through the business freedom coefficient obtained from the Heritage Foundation index. The level of taxation is measured by the amount of levied sales tax, and public infrastructure is represented by the total length of rail lines. The quality of the labour market is assessed using the labour freedom index in the host country, also sourced from the Heritage Foundation.

Froot (2008) demonstrated that depreciation of the host country's currency led to an increase in inward FDI. Froot and Stein (1991) found a similar effect in the case of Japanese firms investing in the USA. Both of these findings should be reflected in a positive coefficient for the real exchange rate of the host country.

In summary, the model incorporates various factors to capture the determinants of FDI, including labour costs, education, market size, institutional governance,

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taxation, infrastructure, labour market quality, and exchange rates. By considering these variables, the model aims to provide a comprehensive understanding of the factors that influence FDI flows between source and host countries. Taking the aforementioned points into account, the econometric model is constructed as follows:

$$logFDI_{S,R}^{t} = C + \beta_1 LOG\_GDPS + \beta_2 LOG\_GDPR + \beta_3 LOG\_DIST + \beta_4 TERTEREDUC + \beta_5 FRDM\_BUSSR + \beta_6 FRDM\_LABORR + \beta_7 NETTAXPRODUCTSR + \beta_8 RAILSR + + \beta_9 TARRIFSB + \beta_{10}\text{FXS} + \beta_{11}\text{FXR} + \beta_{12}\text{GNIPR} + \epsilon_i \quad (6)$$

4 Results

The regression results for POLS, FE and RE are provided in Table 3.

Table 3: Regression Results for Coefficient by using POLS, FE and RE estimator

	Coefficients			t-Statistic			Probability		
Indep.Variable	POLS	Fixed Effects	Random Effects	POLS	Fixed Effects	Random Effects	POLS	Fixed Effects	Random Effects
LOG_GDPS	-0,0341	-4,1567	-0,1663	-0,1485	-0,2945	-0,5432	0,8821	0,7688	0,5877
LOG_GDPR	1,8859	0,13771,7700	1,77	4,41830,03	0,00354	4,029	0	0,9718	0,0001
LOG_DIST	-2,0009	-	-1,955	-3,4312	-	-2,5052	0,0007	-	0,0131
TERTEREDUCR	-0,0225	-0,3105	-3,0303	-0,5741	-1,0198	-0,6686	0,5666	0,3096	0,5046
FRDM_BUSSR	0,0451	0,0105	0,0391	1,3137	0,1372	1,247	0,1905	0,8911	0,214
FRDM_LABORR	0,0788	0,2183	0,0804	2,9956	0,9628	2,6086	0,0031	0,3374	0,0098
NETTAXPRODUCT	-3,96E-13	-4,15E-12	2,50E-12	-0,0395	-0,2426	0,2704	0,9685	0,8087	0,7872
RAILSR	-1,79E-05	4,77E-05	-1,60E-05	-0,8882	0,3195	-0,6909	0,3756	0,7498	0,4905
FXS	1,22E-02	-1,11E-02	2,70E-03	1,5754	-1,1711	0,3442	0,1169	0,2436	0,7311
FXR	5,21E-02	-6,10E-02	5,42E-02	0,8508	-0,6333	0,8695	0,3961	5,5276	0,3857
GNIPR	-5,75E-05	4,52E-04	-0,0001	-0,6077	1,305	-0,6079	0,5441	0,1941	0,5440
C	-34,2133	104,2339	-27,3975	-2,7713	0,2563	-2,1801	0,0061	0,7981	0,0305
R-squared	0,2485	0,6207	0,1711	0,2485	0,6207	0,1711	0,2485	0,6207	0,1711
Adj. R-squared	0,2043	0,4438	0,1224	0,2043	0,4438	0,1224	0,2043	0,4438	0,1224

Source: Prepared by the author

The regression results reveal the following findings:

1. LOG_GDPS (logarithm of GDP of the source country) has negative coefficients across all three models, but none of them are statistically significant, as indicated by the high p-values (0.8821, 0.7688, and 0.5877).

2. LOG_GDPR (logarithm of GDP of the receiving country) has positive

and statistically significant coefficients in the Fixed Effects model (p-value < 0.01) and the Random Effects model (p-value < 0.01). This suggests that a higher GDP in the receiving country is associated with higher FDI inflows.

3. LOG_DIST (logarithm of distance between source and receiving country) has negative and statistically significant coefficients in the POLS model (p-value < 0.01) and the Random Effects model (p-value < 0.05), indicating that greater distance between countries is associated with lower FDI flows.

4. TERTEREDUCR (tertiary education in the receiving country) has negative coefficients in all models but none of them are statistically significant, as shown by the high p-values (0.5666, 0.3096, and 0.5046).

5. FRDM_BUSSR (freedom of business and institutional governance in the receiving country) has positive coefficients in all models but none of them are statistically significant, with p-values of 0.1905, 0.8911, and 0.214.

6. FRDM_LABORR (quality of the labour market in the receiving country) has positive and statistically significant coefficients in the POLS model (p-value < 0.01) and the Random Effects model (p-value < 0.01), but not in the Fixed Effects model. Suggesting that higher labour market quality in the receiving country is associated with increased FDI inflows.

7. NETTAXPRODUCTSR (taxation in the receiving country), RAILSR (total length of railways and roads in the receiving country), FXS (foreign exchange rate of the source country), FXR (foreign exchange rate of the receiving country), and GNIPR (gross national income per capita, i.e., labour costs of the receiving country) do not have statistically significant coefficients in any of the models, as indicated by their high p-values.

8. The constant term (C) is negative and statistically significant in the POLS model (p-value < 0.01) and the Random Effects model (p-value < 0.05).

9. The R-squared values show that the Fixed Effects model explains the highest proportion of the variation in the dependent variable (62.07%), followed by the POLS model (24.85%) and the Random Effects model (17.11%).

Overall, the most consistent and significant determinants of FDI inflows appear to be the GDP of the receiving country (LOG_GDPR) and the quality of the labour market in the receiving country (FRDM_LABORR). The distance between countries (LOG_DIST) also seems to have a negative impact on FDI

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flows. However, the other variables do not show consistent or statistically significant effects across the three estimation methods.

The overall explanatory power of the model varies depending on the estimation method employed. When using Pooled Ordinary Least Squares (POLS), the model is capable of explaining 24.85% of the observed variation in FDI, with an adjusted R-squared of 20.43%. However, the FE estimation achieves a notably higher R-squared of 62.07% and an adjusted R-squared of 44.38%, indicating a better fit of the model to the data. In contrast, the RE estimation yields a much lower explanatory power.

To determine the appropriate estimation method between FE and random effects, the Hausman test is conducted. The test results in a Chi-Square Statistic of 17.17547 and a corresponding probability of 0.0706. These values lead to the rejection of the null hypothesis, signifying the superiority of the FE model over the RE model in this particular analysis.

In conclusion, the regression analysis highlights the significance of geographical distance, host country's GDP, real exchange rate of the source country, and labour market freedom in explaining FDI flows. The FE estimation proves to be the most suitable approach, providing a higher explanatory power compared to the POLS and RE. These findings contribute to a better understanding of the determinants of FDI in the studied context and offer valuable insights for policy-making and investment decisions.

5 Conclusion

In conclusion, this study provides valuable insights into the determinants of FDI inflows in EECA region by examining the impact of the ownership-location-internalization (OLI) paradigm and the investment development path (IDP) on the gravity model of FDI. The analysis, conducted using panel data from 1995 to 2017, employs Pooled Ordinary Least Squares (POLS), Fixed Effects, and Random Effects estimation methods to identify the most significant factors influencing FDI inflows. The results highlight the importance of the receiving country's GDP and labour market quality as the most consistent and statistically significant determinants of FDI inflows. Additionally, the distance between source and receiving countries exhibits a negative relationship with FDI flows, suggesting that greater distances can hinder FDI. Other variables,

such as the source country's GDP, tertiary education, institutional governance, taxation, infrastructure, foreign exchange rates, and labour costs, do not show consistent or statistically significant effects across the estimation methods.

The Fixed Effects model demonstrates the highest explanatory power, indicating its suitability for capturing the variation in FDI inflows. This finding suggests that country-specific characteristics play a crucial role in determining FDI flows.

The insights gained from this study have important implications for policymakers and investors in the EECA region. Countries aiming to attract more FDI should prioritize policies that promote economic growth, improve labour market conditions, and reduce the perceived distances between source and receiving countries. This can be achieved through various measures, such as trade agreements, cultural exchanges, and infrastructure development.

However, it is essential to mention the limitations of this study, including the potential omission of relevant variables, the limited sample size, and the specific time period considered. Future research could extend this analysis by incorporating additional determinants, expanding the country coverage, and examining different time periods to gain a more comprehensive understanding of the factors influencing FDI flows in the EECA region.

Overall, this study contributes to the existing literature on FDI determinants by integrating the OLI paradigm and the IDP into the gravity model framework, providing a novel perspective on the factors driving FDI inflows in the EECA region. The findings offer valuable guidance for policymakers and investors seeking to attract and promote FDI, ultimately contributing to economic growth and development in the region.

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