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**Abstract:**

Wide range of academic studies and economic practice are showing strong correlation between GDP growth and FDI flows. Moreover, there is a number of cases when FDI inflows were positively impacting economic development. That provides grounds and needs for profound research in the area of investment determinants. The main objective of this paper is to classify FDI determinants in the EU countries. All assuming that there are differences between the two groups – old and new member states. The econometrical approach of gravity modelling was chosen as the most appropriate methodology to analyse panel data set. Panel is depicting FDI flows coming from the external non-EU investors and does not include intra EU investment flows among the member countries (firstly due to the relative insignificance of the intra-EU flows compared to the outer inflow values and secondly due to the need to answer what exactly leads non-European investor to opt for the EU country A and not B). The random effect model has proved diversity in FDI flows determinants. Study outcomes support the need for policymakers' attention in the EU investment policy harmonization, towards market equalization that would improve competitiveness of the whole EU region.

**Keywords:** foreign direct investment, EU integration, gravity based modelling, panel data, fixed effect, random effect

**JEL Classification:** C23, F15, F21, F23

## 1. Introduction

FDI transition may facilitate growth, promote technical innovation and accelerate enterprise restructuring in addition to providing capital account relief (EBRD). Some authors (*e.g.* Alguacil, Cuadros, 2008) are arguing about spillover effects of FDI, mainly from the technological point of view: spillovers depend on human capital development level and institutional capabilities. The extent to which FDI is expected to be growth enhancing seems to be dependent on the local conditions of the recipient countries. The level of the knowledge oriented workforce in EU15 member states is undoubtedly high, and the case of new member states (NMS) is improving significantly by each year.

The overwhelming share of inward and outward FDI in the EU is operated by EU15 states (in relation to the outer world), however, NMS could be as well considered as the economies with big potential. A number of studies have focused on the prediction of growth in investment inflow into accession countries after the EU enlargement (Gorg, Greenaway, 2002). The other, more recent, studies (Borrmann, Jungnickel and Keller, 2005 or Bos and Laar, 2005), on the other hand, are stating that after-accession investment growth has reached its peak and FDI inflow is not expected to increase significantly (that

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is especially the case of Central European countries). However, what are the determinants of the FDI inflows to the EU for the non-EU investors? Provided that the determinants are the same for all the EU countries, what is the reason for the EU15 being a recipient of giant part of foreign capital and NMS being foreign capital dwarf? Or possibly the determinants are insofar diverse in the separate EU groupings so that NMS do not have any potential to reach equal FDI volumes.

The main objective of this study is to detect the determinants of the direct investment in the EU (from the perspective of the non-EU investor) and identify their possible dissimilarities between old and new member states. In contrast to the existing studies that examined investment patterns in the EU15 and NMS separately, this paper looks at the both EU groupings together. The panel data are regressed in a gravity approach model using the econometric methodology of fixed and random effects. A statistical dataset on annual FDI flows between 27 EU member states and 9 main extra-EU investing partners is obtained from the Eurostat and World Bank databases. The set of explanatory variables consist of three categories depicting size of the market, role of the economic distance and countries endowments.

The paper is structured as follows: firstly the short empirical overview and the list of existing literature on investment conditions in the EU is provided. Secondly, theoretical premises for the main survey are defined, consequently the econometric fundamentals of the model framework are discussed. Ultimately, the actual research results are stated with compendious critics and evaluation of the survey findings.

## 2. Empirical Overview

The European population is enjoying very diverse income levels, the more you go to the East, the lower is the income. General causality causes high income countries to specialize in the knowledge intensive production, while medium and lower income economies are becoming the source of labour intensive production. Majority of the EU15 countries are in the high income category, operating with higher value added, while NMS are economies with significantly lower wages. There is a mutual relationship between GDP growth rates and FDI, the impact of FDI on GDP is proved to be substantially stronger than *vice versa* (Kalaman and Kalotay, 2004).

The level of the EU integration is denoted by UNCTAD (Kalotay, 2007) as a deep integration, not a shallow (trade based) integration. This should be a major direct attraction of the EU-based transnational corporations and a major indirect attraction of external investors. In principle, new EU members could be attractive for FDI, as they represent the unique combination of a large single market (with a high purchasing power of consumers in the neighbouring EU15) and an efficient cost location. Nevertheless, those favourable circumstances do not automatically represent high FDI inflow; the country specific characteristics could always influence real capital flow values and its spillover potential. The theory of trade creation affirms that economic integration provides efficient distribution of economic activities among the members. While the total volume of trade remains unchanged and more efficient locations replace less efficient ones, it is considered as a successful trade creation (Viner, 1950). The same logic could be applied to FDI flows in case of EU integration – NMS are lower cost production countries and while being brought into the EU production process the location of production activities could be redirected from the less cost-competitive (older) members. This would provide the

EU15 an opportunity to use high-knowledge human capital in much more sophisticated spheres of economy. Such a scenario could lead to the win-win situation as each of the participants will increase output thanks to a better specialization in their comparative advantages, and by that increase overall welfare. However, the 12 new members have so far neither diverted significant amounts of FDI away from the 15 older members of the Union, nor improved their FDI position in relation to the older members (Kalotay, 2007). Lower labour costs of NMS should be one of the strongest determinants of FDI attraction. Although it is important to bear in mind that this advantage is relative – costs are lower in comparison to the EU15, however, at the current stage already higher than in CIS countries. Therefore, it is highly uncompetitive to base the long-term economic strategy only on the cost advantage. Nevertheless, the above mentioned notion is not fully integrated into the policies of the EU members; the level of taxation could serve as a good example. The EU member countries enjoy a high degree of autonomy in the setting of their corporate rates according to their development priorities (Tupy, 2003). For example, those who are willing to attain high GDP growth rates as a spillover of the inward FDI, may set the tax rate relatively low, as well for the reason of stimulating further reinvestment of earnings into production. On the other hand, countries with higher *per capita* GDP and lower growth may maximize fiscal revenues by setting their rates relatively high. Another example in line with the above discussed is the social dumping that could be initiated in the EU15 as a protection from the price competitive wages in NMS. However, it has been empirically proven that the effect of any wage differential is stronger within unskilled labour, but limited in sophisticated one (Busse, 2002) and any forms of social wages have only negligible effect on location choices. Only specific issues such as strike intensity are affecting the flow of FDI significantly (Alderson, 2004).

The May 2004 enlargement offered a certain degree of stability and security for the investors. It is possible to claim that NMS went through liberalization of trade and capital flows, already after the Europe Agreements signing, which led to a significant increase in FDI flows. A first wave of investment was due to cross-border mergers and acquisitions, especially driven by privatization processes. The influx of business services changed FDI patterns in the middle income countries (the Czech Republic, Poland, Hungary) and initiated restructuring towards higher-value added activities (cost competition from Asia supported redirection of activities). Availability of flexible and skilled labour force and competitive production costs created the unique combination for business services allocation, in addition to its existing manufacturing facilities (*e.g.* Alcoa GE, DHL, Phillips, Siemens, Telenor, Alcatel). However, as Kalaman and Kalotay (2004) noticed, the knowledge intensive corporate sector can be established with relatively small capital investment. Nevertheless the existence of a favourable business environment with the predisposition of skilled and low cost labour is only beneficial for future investment. Such a development in NMS determined West European public opinion to adopt almost the commonplace assertion that the CEEs are attracting away FDI from the current EU15 members. Researchers in that field are providing contradictive findings, *e.g.* Alguacil and Cuadros (2008) proved a different nature of the capital inflows, stating that in EU15 FDI are motivated by diversification objectives rather than by investment needs. Besides, the division of labour between the two sub-regions still plays rather significant role and competition for projects from the same investment category seems to be distant. The predominating phenomenon is reallocation of the activities from the EU15 to NMS while replacing them by more skilled ones.

Moreover, NMS receive only a small fraction of EU15 FDI. Therefore instead of internal competition there is a challenge to harmonize FDI promotion policies among EU countries and prevent a decrease in attractiveness of the whole region.

### 3. Theoretical Premises

For the need of the present paper we will leave out the exploring of the theoretical field explaining investment in developing and emerging markets and only focus on the eclectic framework and knowledge-capital model most relevant for the EU region.

The eclectic paradigm, or OLI model, is based on the transaction cost theory that combines both micro and macro aspects. Dunning (1977, 1988) developed following OLI factors: Ownership advantages, Localization advantages and Internalization advantages into the complex internalization theory discussing preconditions for the international activities (export, FDI, licensing and sub-contracting). According to that theory the more of O and I advantages a company holds and the more L advantages will be created abroad on a host market, the more FDI will be undertaken. FDI typology, based on the OLI theory and determining benefits of localization, was further derived by Behrman (1972) and explained diverse objectives: resource seeking FDI, market seeking FDI, efficiency seeking FDI and strategic assets seeking FDI. The concept of change in FDI flow and type in the process of industrial and income growth was as well depicted by Kalotay (2004). When the host countries (originally low or middle income groups) industrialize and upgrade skills by learning, the FDI flowing from the home countries change their pattern towards high-skill production and activities gradually flow out from relatively advanced host countries to newcomer host countries (which could be the case of NMS very soon).

Another representative of the industrial-organization approach to international trade (new trade theory) is the knowledge-capital model defined by Markusen (1984, 2002). This model markedly follows OLI paradigm advantages, especially ownership advantages in the form of the so-called knowledge capital (blueprints, patents, procedures or marketing assets, such as trademarks, brands or reputation). This theory questions why such capital is mainly associated with multinationals and why their comparative advantage is foremost in services of knowledge capital and not in services of physical capital.

In this paper the following theoretical hypotheses are deduced for further empirical research:

- FDI flows into EU sub-regions (the EU15 and NMS) are determined by the different motives,
- in terminology of the OLI paradigm, the EU15 is predominantly a magnet for efficiency seeking, strategic assets and capabilities seeking FDI, while NMS are rather inclined to attract resource and market seeking FDI,
- the EU15 sub-region is a good example of the gravity approach and knowledge-capital theories (investment relationships among developed countries, appealing investors into same industries by existing clustering),
- NMS should not headlong compete for the same FDI categories with highly developed EU15 countries, but focus on its own clustering by the so-called selective targeting (focus on particular industries or even particular companies),

- interdependency of increasing FDI and GDP could inherently change the FDI character towards higher skilled and knowledge intensive production,
- in the long run FDI could help to eliminate disequilibrium in the income and development level between two EU groupings and take a share in the EU economy harmonization process.

## 4. Econometric Specification and Model Framework

### 4.1 Gravity model approach

FDI flows are generally inconstant and significantly vary between economies without a clear time trend. The gravity modelling is frequently used in order to explain that phenomenon. Recent studies of Bevan and Estrin (2004), Hejazi and Safarian (1999), Borrmann, Jungnickel and Keller (2005), Sova (2009) could serve as an illustration. The gravity model suggests that elements of abroad production costs and costs of exports are captured by the relative market sizes of two economies and their distance from each other. Common usage of this approach could be explained by relative simplicity and remarkable predictive power. A substantial proportion of gravity models are based upon Linnemann (1966) equation for bilateral trade flows, later adjusted by various authors, *e.g.* Breuss and Egger (1997). The basic equation derived by Deardorff (1995) (in Bos, Laar) focuses on the FDI flow from home country *i* to host country *j*, with three categories of explanatory variables: size of the market ( $GDP_i$ ,  $GDP_j$ ), distance between the economies ( $DIST_{ij}$ ) and a set of specifying factors ( $T_{ij}$ , such as taxation rate, common border *etc.*):

$$FDI_{ij} = A_{ij} * ((GDP_i * GDP_j) / DIST_{ij})$$

The logarithmic form of the equation:

$$\ln FDI_{ij} = \beta_0 + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j - \beta_3 \ln DIST_{ij} + A_{ij} + E_{ij},$$

generally advocates that with zero market size (measured either in money units or number of population) existence of capital flows is impossible, and distance (from geographical point of view) is expected to have negative influence. Therefore sign of the  $\beta_1$ ,  $\beta_2$  coefficients is traditionally expected to be positive (the larger is market size, the larger is the received investment) and the distance coefficient  $\beta_3$  is negative. However, a number of studies showed that effects could be very ambiguous, depending on dominating effects: distance could represent increasing trade costs and therefore FDI flows, on the other hand, could serve as a complement. Moreover, comprehension of distance could vary from geographical, cultural to economical, and is not necessarily used in the model, *e.g.* Bevan *et al* Estrin (2000) in Bos. A smaller GDP size (or *per capita* purchasing power) should not automatically mean negative effects on FDI flows, as production costs in a particular economy could lead to comparative advantage and market size of surrounding economies would satisfy expected value of sales.

## 4.2 Panel data – dataset specification

Data input of the model is based on a two dimensional balanced panel – country pairs between the most significant world investors (extra-EU) and EU member states; observed in consecutive 9 years (2000-2008). The extra-EU investors chosen for the purpose of this study are: the USA, Japan, Switzerland, the Russian Federation, India, China, Hong Kong, Brazil and Canada. Mentioned economies participate in world investment with share of 40% (average percentage of total outflows and stock during 2000-2008, UNCTAD FDI database) and are major trade and investment partners of majority EU members. Extending the data to other donor countries would result in a high portion of zeros and missing values, creating disproportional number of time series for different panel groupings. The number of observations has decreased from expected amount of 2,187 (amount of panels) due to zero or negative value of yearly FDI flow statistics and further adjustment of functional form of regression and consists of 560 observations. To prevent a bias from the pooling of countries that are structurally different (level of development, size of economy) and depict the distinction between old and new member states, two country groupings were created – the EU15 (old member base) and NMS (states that joined the EU after 2004 and 2007 enlargements). The data sources are presented in the Appendix.

The regression performed in this paper uses a panel data setting as they enable to avoid misspecification problems involved in individual heterogeneity, while at the same time it allows country specific differences and provides more degrees of freedom, higher variability, less collinearity and therefore greater efficiency (Hsiao, 2006).

## 4.3 Model framework

The variables included into the constructed gravity approach model to determine factors of investment appeal of the EU15 and NMS countries could be divided into three sets (likewise categorization in Borrmann, Jungnickel, Keller, 2005). The first two sets are designed from the traditional gravity approach; the third group is derived from new theories of FDI:

- market related variables (GDP, GDP growth rate, existing FDI stock),
- distance related variables (economical distance, trade performance, openness of imports, political and economic risk),
- endowment related variables (unit labour costs in host country, *per capita* income).

Denoting the year by  $t$ , home country by  $i$  and host by  $j$ , we estimate the following specification (individual variables are defined in the Table 1):

$$FDI_{ijt} = f(\ln FDI_{ijt}, FDI_{ijt}^{stock}, GDP_{jt}, GDP_{it}, GDP_{pc_{it}}, GDP_{pc_{jt}}, GDP_{jt}^{growth}, Import_{ijt}, Export_{ijt}, DIST_{ijt}, LC_{jt}, IR_{jt}, INFL_{jt}, EDUC_{jt})$$

**Table 1 | Definition of the Variables**

variable	definition
$FDI_{ijt}$	annual bilateral flows from extra EU country i to EU country j in time t
$lagFDI_{ijt}$	one year lagged $FDI_{ijt}$
$FDI_{ijt}stock$	existing value of investment stock created by country i in country j
$GDP_{jt}, GDP_{it}$	gross domestic product
$GDPpc_{it}, GDPpc_{jt}$	gross domestic product <i>per capita</i>
$GDP_{jt}growth$	annual GDP growth rate in EU country j
$Import_{ij}$	amount of inflow trade from country i to j
$Export_{ji}$	amount of trade outflow from country j to i
$DIST_{ijt}$	economical distance between home and host economy (GDP pc in quadratic form)
$LC_{jt}$	hourly labour cost in host economy (sectors: industry, service)
$IR_{jt}$	annual average of long term interest rates (%)
$INFL_{jt}$	annual average inflation rate (HICPs for EU and national consumer price indeces for non-EU)
$EDUC_{jt}$	tertiary enrollment in % on total gross enrollment of EU population

To control the investment determinants' differences among the EU15 and NMS, an intercept dummy variable was introduced. After proved significance of intercept dummy, a variable set of interaction dummies was included to observe the slope of particular regressors.

Lagged variables for  $FDI_{ijt}$  flows ( $FDI_{ijt(t-1)}$ ) and existing FDI stock, unlike in model of Döhrn (1996), were introduced as independent regressors to prevent the bias from existing difference in starting levels of investment. The empirical foundation is obvious: two groupings have got a different investment history background and the existence of significantly large FDI stock in the EU15 could serve as a considerably relevant determinant for further trends in investment accumulation. By including lagged regressors, a dynamic model is created, which can help to avoid non-stationary residuals and eliminate serial correlation as any shocks take time to work through the system. The FDI flows occur some time after decisions have been made, process of choosing and implementing investments abroad is time consuming, some information is becoming available only with a lag (Bevan and Estrin, 2004).

The market size of the investment partners is expressed by the GDP variable and it is a proxy for the product demand and the potential for growth and the capacity to supply. Both GDP variables are expected to be positive. Same is the rationale of *per capita* GDP showing purchasing power of the local consumer.

Trade is included to observe the relevance of existing economic cooperation and potential for further investment complementarity or subsidiarity. The variable is as well designed to capture the openness of the host economies. Openness and FDI should be positively related,



multinationals have a higher propensity to export and the market is more liberal, therefore a positive coefficient for trade is expected *e.g.* in the Helpman model (1984).

The distance parameter is viewed from an economic prospective only as geographical understanding of distance, and in contrast to trade, it does not clearly represent a negative factor. For the FDI distance variable it could be an impediment (coordination cost could increase with distance) as well as an incentive (ability to avoid transportation costs or trade barriers). Statistically distance represents a very ambiguous determinant – insignificance of obtained coefficients does not necessarily mean unimportance (for some investors higher distance could be a very positive and for some highly negative factor). The econometric foundation for geographical distance omission is a specificity of fixed effect panel regressions: the time invariant variables are not considered, therefore classical distance and population from the classical gravity model specification is not appropriate. Moreover, a population parameter is not included as it is perfectly collinear with GDP and GDP *per capita* variables.

Hourly labour cost is one of the investment profitability determinants; where the expected sign of the coefficient is negative as with growing labour costs the level of profit is decreasing. The variables for the inflation, interest and growth rate could serve as a helpful set of parameters describing stability. Skills and amount of sophisticated labour force could be measured by the tertiary enrollment variable and are positively related especially with the investment into the service sector.

Graphical examination did not detect any significant outliers. Skewness and Kurtosis tests for normality did not reject the null hypothesis for normality for the vast majority of the variables (with skewness fluctuating around 0 and kurtosis around 3, at the significance level not exceeding 10%). Failure of normality does not lead to bias of estimations, they are still BLUE (Best Linear Unbiased Estimators), however, statistical testing relying on distribution of standard errors is seriously affected. As a most common solution to non-normality, adjustment of functional form into log or semi-log version is used, while the usage of generalized least squares (GLS) could also lead to improved results (Greene, 2003). Autocorrelation in the residuals was identified. As one of the procedures to correct correlation between predictors and the time invariant residuals is the creation of the dynamic panel analysis by adding a lagged variable (Baltagi, 1999). Such a modification could handle both balanced and unbalanced panel data and is usual technique used in fixed and random effects models (Arrelano and Bond, 1991). Heteroscedasticity is linked to non-normality and results in unbiased estimators, but inefficient standard errors. To avoid the heteroscedasticity problem the method of GLS as well as functional form change was used, as a log transformation compresses the scale in which the variables are measured. Multicollinearity was tested using Variance Inflation Factor and the value of mean VIF for all parameters is reaching 5.28, which does not exceed the value of 10 (commonly accepted rule of thumb).

The panel data sets are now most commonly analysed by techniques of the fixed effects or random effects models. The fixed effects model has a strong advantage of cancelling out time-constant unobserved heterogeneity (the group-specific error components are now uncorrelated with explanatory variables). However, such a fixed effects estimation by its logic does not allow the inclusion of time-invariant explanatory variables used in traditional gravity models, *e.g.* geographical distance. The second technique of random effects, on the other hand, assumes random variation across entities (uncorrelated with



dependent variables) and therefore with the existing influence of differences among groupings on dependent variable it is more appropriate. Hausman test was used to opt between fixed and random effects. Null hypothesis states that preferred model is random effects, where the alternative is fixed effect model (Greene, 2008). Results of the test:  $\text{Chi}^2(28) = 46.15$ ,  $\text{prob} > \text{Chi}^2 = 0.168$ , cannot reject the null hypothesis neither at 5% or 10% of significance, and therefore we opt for the random effects model using pooled-GLS, which is appropriate adjustment to prevent misspecification of the model.

## 5. Results from Estimating the Gravity Model

The model revealed difference between two observed groupings, expressed by the dummy variable. As was expected, the presence of accumulated FDI stock during previous years has a positive influence on further investment flows (both in the EU15 and NMS), GDP of the investor has a positive sign (both in the EU15 and NMS), trade expressed by export is positively correlated with capital flows and increasing labour costs have a negative influence on FDI flows in both groupings. However, different results were obtained for the GDP growth parameter, in case of the EU15 this variable has a negative sign and NMS shows a positive relation between investment flow and product growth (here variable is less significant than in case of the EU15). An analogical difference is found for the GDP *per capita* variable of host economies: increasing *per capita* GDP is a very significant explanatory variable of the EU15 investment flows with a positive influence, while NMS *per capita* GDP increase tends to lower incoming FDI flows.

The overall fit of the model is relatively high – chosen independent variables are explaining 70.71 % of observed FDI flows. Chi-2 as well proved that all coefficients in the model differ from zero and major part of the independent variables is significant at least at the 10 % level (Table 2).

Existing FDI stock is a significant determinant of the investment flows in both groups. The more FDI an investor has created in previous years, the more it is expected to be received in future. That is a very positive finding, especially for EU15 countries, as their FDI stock is higher than the stock of NMS. This determinant represents an existing bond between investment partners and is a result of the long-run cooperation. Investors from such category had already proved profitability and stability of their capital inputs. In NMS the identical variable has almost the same size of coefficient with comparable significance; however, it is rather the matter of future challenge than a recent advantage.

Somewhat surprising are results for GDP/*capita* coefficients. According to theory it is expected to detect a positive relationship between investor's GDP/*capita* and his FDI outflows, however growing GDP/*capita* of host country residents has ambiguous outcomes. In the EU15 the determinant of *per capita* income has a very high significance and explains a relatively large portion of the FDI flows. High income of the host country population represents higher values of purchasing power and a potential increase of demand. Such an interpretation supports without doubt the case of the EU15, high income countries, where the majority of the FDI goes into service sector, mainly financial intermediation and real estate business services (EU FDI Yearbook, 2008). On the other hand, there is a different situation in the NMS: nevertheless the coefficient is much lower than in EU15 countries, growing GDP/*capita* in NMS could negatively influence FDI flows. There could be several explanations for such, at first sight contradictory result:

a substantial part of the NMS FDI inflows is directed into the manufacturing sector, and considering the correlation with significant positive export and negative labour cost coefficients. Growing *per capita* income represents increasing labour costs for foreign production that is located in NMS territory, mainly with the idea of further re-exporting (under condition that local market demand is outweighed by the other trade destinations). Contrariwise, such negative scenario is rather sector-specific, which means that the above mentioned explanation is relevant for the existing type of investment flows (into less sophisticated sectors) and any income increase could shift recipient countries into a different level in terms of sector of FDI interest (from manufacturing and basic services into higher value added sectors).

**Table 2 | Econometric Results for the RE Model (Time Period: 2000-2008, Dependent Variable FDI<sub>ijt</sub>)**

	EU 15 estimate		NMS estimate	
<b>FDI<sub>ijt(t-1)</sub></b>	0.04	(-0.05)2	-0.02	(0.07)
<b>FDI<sub>ijt</sub> stock</b>	0.47 ***1	(-0.06)	0.22	(0.09)
<b>GDP<sub>it</sub></b>	-0.11	(-0.10)	0.12 **	(0.14)
<b>GDP<sub>it</sub> per capita</b>	0.36 ***	(0.13)	-0.36	(0.20)
<b>GDP<sub>jt</sub></b>	0.05	(0.18)	0.16 *	(0.25)
<b>GDP<sub>jt</sub> per capita</b>	3.25 ***	(1.23)	-3.26	(1.43)
<b>GDP<sub>jt</sub> growth</b>	-0.29 *	(0.16)	0.33 **	(0.23)
<b>Import<sub>ijt</sub></b>	-0.09	(0.15)	0.13	(0.20)
<b>Export<sub>ijt</sub></b>	0.57 ***	(0.19)	-0.55	(0.21)
<b>DIST<sub>ijt</sub></b>	-0.03	(0.04)	-0.01 ***	(0.10)
<b>LC<sub>jt</sub></b>	-2.98 ***	(1.07)	2.75	(1.25)
<b>INFL<sub>jt</sub></b>	-0.39 *	(0.24)	0.31 **	(0.28)
<b>IR<sub>jt</sub></b>	0.07	(0.42)	-0.22	(0.57)
<b>EDUC<sub>jt</sub></b>	0.48	(0.65)	-0.88	(0.79)
<b>intercept</b>	-29.98 ***	(10.41)	29.80 **	(12.23)
<b>Number of observations: R-sq: within       between       overall</b>	<b>560 Wald chi2(29): 0.13 0.83 0.71</b>		<b>712.91</b>	

1 The standard errors are reported in brackets.

2 \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%.

The *per capita* income coefficient interpretation provides us with a strong ground for the labour costs variable understanding. In both groups increasing labour costs represent a significantly negative influence on investment inflows. This negative sign of the coefficients shows as well cost sensitivity of the investors. An indicator for certainty of long lasting and persistent profitability is macroeconomic stability of the host country, which was always considered to be an important decision making factor for investment, especially in case of the transition economies (Henisz, 2000). However, in the case of the EU15 economies, any percentage increase leads to a much higher decrease in FDI flows than in NMS states. That is in conformity with economic reality as labour cost base in the EU15 is reaching a very high level already and there is not much of freedom left for a further increase and being competitive without additional qualitative improvement of labour. Such a tendency is to a certain degree positive for the NMS that are the source of relatively skilled but still cheap labour force. A certain amount of the high value added services could be redirected to the NMS and substituted by even more sophisticated sectors in the EU15.

Export appeared to be the only significant coefficient representing the trade relations between countries, leaving import in the category of variables with lower explanatory power. However, while theoretical rationale expects firms' export entrance on the market as a pre-stage of FDI entry, it is not necessarily the case of EU countries. The model has revealed the existence of some substitution effects between FDI and trade inflows, nevertheless complementarity of investment into the economy and further increase in host country exports is the matter. Such feature could be explained by the re-exporting of produced goods back into the home economy. In the case of the EU15 countries the role of re-exporting of companies operating abroad is highly significant in the explanation of the FDI flow values. Under such rationale, companies investing in NMS markets tend to leave production on the EU market or re-export it indirectly. Analogous results were revealed in Bos and Laar's (2004) gravity model.

An opposite polarity has been detected in the coefficient for GDP growth rates, while NMS investment is positively correlated with total GDP growth rates (representing dynamics of economy and increasing market size) the contrary is the case of the EU15. Coefficients were expected to have the same direction of influence as the *GDP/capita* variable, however, reverse results have been found. A negative influence of GDP growth rates in the EU15 could be explained by the overall increase in expenses in the investment destination, when investment to a particular sector is interrelated with the further purchases of locally offered, and therefore expensive services and production (that is definitely the case of the EU15).

The low variance in inflation time series and interest rates produces coefficients with lower statistical significance, determinants of stability are therefore not important for our model. Countries from the EU15 block are without any doubt a safe investment destination with a high level of institutional development and the NMS have already improved their image in the catching-up process. Relative capital costs expressed by the interest rate variable have insignificant coefficients, perhaps because investors rely on their own resources and capital markets in their own home countries. The educational level variable has as well a low statistical significance.

## 6. Conclusion

The paper presents an analysis of investment determinants estimation using the gravity modelling and random effects method. The main task of the empirical study was to define whether there is any rivalry between groupings as FDI destinations judging by the determinants of the capital inflows. The results of the model bring deeper insights in the way how to improve competitiveness of the sub-regions and the EU as a whole entity. The theoretical premises for the research are based on the eclectic paradigm and the knowledge-capital models as well as the doctrine of investment role in the process of the market equalization and harmonization processes.

The main technique enabling the investigation of the two EU groupings within the united gravity approach model is the usage of the intercept dummy. The econometric results obtained from the random effect model showed statistical significance of the intercept dummy and by that substantiated the theoretical hypothesis for the different motives of the investment flows into EU sub-regions.

One of the most interesting results is the significance of the GDP/*capita* variable, which has a contrary influence on investment inflows in the researched groupings. That conclusion strengthened the hypothesis that the EU15 region is a source of skilled and high purchasing power customers and employees, so that the growing *per capita* income is a positive investment determinant. The cost efficiency seeking investment currently present in the NMS could be slightly endangered by the GDP/*capita* increase. The matter of export and investment complementarity revealed that the EU15 and NMS countries tend to operate with production in a different way – sophisticated production from the EU15 tends to return into the country of the home investor, however NMS output is mostly distributed in the European region or at least does return into the country of the original capital flow provider. The total GDP growth is driving different effects on the investment development in the two regions, which is expressed by the hypothesis for the change in FDI character towards more skilled and knowledge intensive production. The NMS still have high potential in the GDP growth and the model results state positive influence on FDI inflows. That supports the initially suggested hypothesis proposing industry clustering and preference of selective targeting to unreasonable competition for the FDI categories circulating in neighbouring EU regions.

The depiction of the main strengths and weaknesses of the two sub-regions in investment determination is crucial, not only for the individual countries, but also for the whole integration. When investment policies of the member states would be harmonized and the level of cooperation would increase, EU integration could reach higher levels of competitiveness.

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## APPENDIX – data sources

variable	data source
$FDI_{ijt}$	Eurostat: [tec00049] Direct investment inward flows by main investing country
$lagFDI_{ijt}$	Eurostat: [tec00049] Direct investment inward flows by main investing country
$FDI_{ijt}^{stock}$	Eurostat: [tec00049] Direct investment inward stock by main origin of investment
$GDP_{jt}, GDP_{it}$	Eurostat: nama_gdp_c-GDP and main components – Current prices; Worldbank
$GDP_{pc_{jt}}, GDP_{pc_{it}}$	Eurostat: nama_gdp_c-GDP and main components – Current prices; Worldbank
$GDP_{jt}^{growth}$	Eurostat: [tsieb020] – Real GDP growth rate
$Import_{ij}$	Eurostat: DS-018995-EU27 Trade Since 1995 By SITC
$Export_{ji}$	Eurostat: DS-018995-EU27 Trade Since 1995 By SITC
$DIST_{ijt}$	author's calculation
$LC_{jt}$	Eurostat: lc_an_costh-Hourly labour costs – Nace Rev. 1.1
$IR_{jt}$	Eurostat: [tec00036] – Long-term interest rates
$INFL_{jt}$	Eurostat: [tsieb060] – HICP – all items – annual average inflation rate
$EDUC_{jt}$	Worldbank (EdStats)