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FOREIGN DIRECT INVESTMENT AND GLOBALIZATION

The main objective of this article is to explain the link between foreign direct investment and globalization. The determinants of the location were used as market size, human capital, and urban population. Beyond these one institutional variable was introduced − the impact of globalization on FDI. The study applies a panel data approach (fixed effects and GMM system estimator). The results show that market size and globalization have positive impact on FDI. Openness trade and urban population are also statistically significant.

Keywords: foreign direct investment; globalization; panel data.

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ПРЯМІ ІНОЗЕМНІ ІНВЕСТИЦІЇ ТА ГЛОБАЛІЗАЦІЯ

У статті пояснюється зв'язок між прямими іноземними інвестиціями та глобалізацією. В якості факторів, що визначають даний взаємозв'язок, обрано розмір ринку, людський капітал та міське населення. Основною змінною в аналізі є вплив глобалізації на ПІІ. Для аналізу використано метод панельних даних. Його результати показали , що розмір ринку та глобалізація позитивно впливають на ПІІ. Статистично значущим можна також вважати вплив таких факторів, як відкритість торгівлі та міське населення.

Ключові слова: прямі іноземні інвестиції; глобалізація; панельні дані.

Форм. 3. Табл. 4. Літ. 24.

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ПРЯМЫЕ ИНОСТРАННЫЕ ИНВЕСТИЦИИ И ГЛОБАЛИЗАЦИЯ

В статье объясняется связь между прямыми иностранными инвестициями и глобализацией. В качестве факторов, определяющих данную взаимосвязь, выбраны размер рынка, человеческий капитал и городское население. Основной переменной в анализе является влияние глобализации на ПИИ. Для анализа использован метод панельных данных. Его результаты показали, что размер рынка и глобализация позитивно влияют на ПИИ. Статистически значимым можно считать влияние таких факторов, как открытость торговли и городское население.

Ключевые слова: прямые иностранные инвестиции; глобализация; панельные данные.

Introduction. Globalization is the growing integration of economies around the world. According to World Bank there have been three waves of globalization. The first wave occurred between 1870 and 1915. The second wave was 1945-1980. The third wave started in 1980 and is continuing to this time.

Foreign direct investment (FDI) is playing an increasingly important role in the world economy. In the last decade within the third wave of globalization the economic linkage between countries has been strengthened mainly by FDI flows. Despite the role of trade multinational firms have chosen this way of internalization and FDI has increased significantly over the last decade outpacing the expansion of trade in the same period (UNCTAD, 2006).

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The link between FDI and globalization has been little studied so far in international economics literature. Dreher (2006) and Dreher et al. (2008) showed that there are problems related to international trade and some of the variables are virtually nonexistent.

The literature on FDI began in 1960s and 1970s with Hymer (1960), Kindleberger (1969), and Caves (1971). Dunning (1981) with the eclectic theory of FDI, suggested that internalization could be explained as movements of multinational enterprises (MNEs).

This article argues and provides evidence that globalization has positive effect on foreign direct investment (FDI).

The study analyses the link between FDI (inward) and globalization for the period 1990-2008. This manuscript uses country-specific characteristics (per capita income, market size, openness trade, human capital and population). We also introduce one institutional explanatory variable (globalization). The countries selected are members of OECD.

The structure of this paper is as follows. The next section presents the literature overview and development of hypothesis. In section 3 we present the methodology. Section 4 shows the econometric model. The final section provides the conclusions.

Literature Review and Empirical Studies. Hymer (1960) explained that activities of multinational enterprises do not involve capital mobility.

Caves (1971) considered that relative production costs, technology, trade and barriers are the determinants of foreign direct investments (FDI).

Dunning (1981) with the eclectic theory of FDI, suggested that internalization could explain the movements of MNEs. The author introduced the eclectic paradigm in 1992. The OLI paradigm explains why investors invest in a host country. Ownership characteristics and advantages could explain a free access to technology, new products. Firms have ownership characteristics (inputs) in patents, brands, human resources, and financial assets. Localization advantages are explained by motivation of FDI. In this topic, we need to think about efficiency. J. Dunning calls movement of production where there are lower inputs costs (outsourcing of production). The author also analyses the foreign market proximity (strategic asset seeking).

In this case Dunning explained the relationships between foreign market proximity and exports, or foreign market proximity and new production (i.e, if it is better to move production).

Jeon and Rhee (2008), Maniam (2007), Skabic, and Orlic (2007), Rodriguez and Pallas (2008), Mukherjee (2008) explained the determinants of FDI using market size, labour costs, labour skills, openness risk, macroeconomic and political stability. Recent literature as Naude and Krugell (2007) consider foreign direct investment as a dynamic phenomenon. Naude and Krugell (2007) specified a dynamic panel data (GMM-DIF) proposed by Arellano and Bond (1991). The study of Naude and Krugell (2007) demonstrated that African policy makers have been intensifying their attempts to attract FDI, researching into the determinants of FDI in Africa.

Peridy (2004) explained the interrelationship between exports and FDI using a GMM-system estimator (Blundell and Bond,1998, 2000). The author applied a gravity equation.

The study of Leitao (2011a) examined the FDI in Portugal. Leitao (2011a) showed that market size and globalization have positive impact on FDI. Corruption has negative impact on investor decisions. Wages, inflation and taxes are also statistically significant.

Following Dreher (2006), and Dreher et al. (2008) we consider that FDI coul be explained by:

$$FDI = f(GDP, TRADE, KOF, SCHOOL, POP)$$ (1)

where $\partial f / \partial GDP \succ 0; \partial t / \partial TRADE \succ 0; \partial f / KOF \succ 0; \partial f / SCHOOL \succ 0; \partial f / POP \succ 0$ and GDP is income per capita; $TRADE$ — openness trade; KOF — index of globalization, $SCHOOL$ — human capital, POP — urban population.

According to Leitao (2011a), and Dreher et al. (2008), globalization promotes competitiveness between nations and local sectors. Local enterprises need to obtain advantages to compete with multinationals.

Methodology and Research design. This study uses a static and dynamic panel. In static panel we estimate Pooled OLS, fixed effects (FE) and random effects (RE). The F-statistics tests the null hypothesis of the same specific effects for all individuals. If we accept the null hypothesis, we could use the OLS estimator. The Hausman test can decide which model is better: random effects (RE) versus fixed effects (FE). The static panel data have some problems, as serial correlation, heteroskedasticity and endogeneity of some explanatory variables. The estimator GMM-system (GMM-SYS) permits the researchers to solve the problems of serial correlation, heteroskedasticity and endogeneity of some explanatory variables. These econometric problems were resolved by Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998, 2000), who developed the first-differenced GMM (GMM-DIF) estimator and the GMM system (GMM-SYS) estimator. The GMM-SYS estimator is a system containing both first-differenced and levels equations. The GMM-SYS estimator is an alternative to the standard first-differenced GMM estimator.

As in Leitao (2011b) to estimate the dynamic model, we applied the methodology of Blundell and Bond (1998, 2000), and Windmeijer (2005) to small sample correction to have corrected standard errors of Blundell and Bond (1998, 2000). The GMM system estimator that we report was computed using DPD for OX (Doornik et al., 2002).

The GMM system estimator is consistent if there is no second-order serial correlation in the residuals (m^2 statistics). The dynamic panel data model is valid if the estimator is consistent and the instruments are valid.

Hypothesis

H1: There is a positive impact on foreign direct investment in the long run.

Leitao (2011a), and Naude and Krugell (2007) defend the idea that lagged foreign direct investment (FDIt-1) promotes the growth.

H2: The market size influences the decision of investors.

GDP is the absolute value of GDP per capita (PP, in current international dollars).

The hypothesis 2 is supported in a theoretical model of Dunning (1992). Krugell and Naude (2007), and Maniam (2007) found a positive correlation.

H3: Globalization promotes foreign direct investment.

For the hypothesis 3, we use the index of KOF[1]. This index represents 3 dimensions of globalization: economic; social and political (see Dreher, 2006; Dreher, Gaston, and Martnes, 2008). http://globalization.kof.ethz.ch.

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[1] The index of economic freedom has 10 components: Business Freedom; Trade Freedom; Fiscal Freedom; Government Spending; Monetary Freedom; Investment Freedom; Financial Freedom; Property Freedom; Freedom Corruption; and Labour Freedom.

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H4: FDI and the openness of economy has a positive correlation.

TRADE, it is a proxy for trade openness, is defined as the exports/GDP ratio. Sun et al. (2001), Skabic and Orlic (2007) found a positive sign.

H5: There is a positive relationship between human capital and foreign direct investment.

SCHOOL, is the ratio of enrollment, regardless of age, to the population of the age that officially corresponds to the level of education shown. According to World Bank Indicators tertiary education is an advanced research qualification normally requires, as a minimum condition of admission, successful completion of education at the secondary level. The source is United Nations Educational, Scientific and the World Bank. Carkovic and Levine (2002), Wijeweera et al. (2010) found a positive sign.

H6: Urban population is positively correlated with foreign direct investment.

POP, is urban population refers to people living in urban areas as defined by national statistical offices. It is calculated using World Bank population estimates and urban ratios from United World Urbanization Prospects. Jonhson (2006) and Wijeweera et al. (2010) found a positive impact between population and foreign direct investment.

Data collection analysis. The dependent variable used is FDI inward from OECD International Direct Investment Indicators. The index of globalization (KOF) used from ETH, Zurich. Other explanatory variables, GDP per capita, trade openness, human capital, and urban population are taken from World Development Indicators (2010), the World Bank.

In Table 1 we can see the selected countries for the period (1990-2008).

Table 1. **Selected countries for the period (1990-2008)**

Australia
Austria
Belgium
Canada
Czech Republic
Denmark
Spain
Germany
France
Finland
Greece
Hungary
Ireland
Italy
Luxembourg
Netherlands
Poland
United Kingdom
United States
Sweden
Brazil
Iceland
Japan

Korea
Mexico
Netherlands
New Zealand
Norway
Poland
Portugal
Slovakia
Switzerland
Turkey

Model Specification

The hypothesis can be tested with the following equation:

$$LogFDI = \beta_0 + \beta_1 LogGDP + \beta_2 LogKOF + \beta_3 LogTRADE + \beta_4 LogSCHOOL + \\ \beta_5 LogPOP + \delta t + \eta_i + \varepsilon_{it}, \tag{2}$$

where *FDI* is the inward foreign direct investment, *X* is the set of explanatory variables. All variables are in the logarithm form; η_i is the unobserved time-invariant specific effects; δ_t captures a common deterministic trend; ε_{it} is a random disturbance assumed to be normal, and identical distributed (*IID*) with E $(\varepsilon_{it}) = 0$ Var $(\varepsilon_{it}) = \sigma^2 > 0$

The model can be rewritten in the following dynamic representation:

$$LogFDI = LogFDI_{t-1} + \beta_1 X_{it} - \rho\beta_1 X_{it-1} + \delta t + \eta_i + \varepsilon_{it} \tag{3}$$

Empirical Results

In Table 2 we can observe   the results of the descriptive statistics of the variables used in this study.

Table 2. **Descrivtive statistics**

Variables	Mean	Std Dev	Minimum	Maximum
Lfdi	4.24	0.92	0.85	6.82
Loggdp	6.12	0.97	4.45	8.99
Logkof	1.91	0.05	1.77	1.97
Logtrade	1.86	0.21	1.28	2.27
Logschool	9.19	1.18	5.16	12.64
Logpop	0.59	0.07	0.34	0.71

In Table 3 we see the results with static panel data (OLS, fixed effects, and random effects estimators). Our analysis pretends to evaluate the signs of the coefficients and their significances.

Table 3. **Static panel data: FDI and Globalization**

Dependent variable: LogFDI				
Independent Variables	OLS	Fixed Effects	Random Effects	Expected Sign
LogGDP	0.86 (0.55)	0.35 (3.71)***	0.19 (6.50)***	(+)
LogKOF	0.41 (0.54)	0.80 (2.22)**	0.26 (1.11)	(+)
LogTRADE	0.32 (5.32)***	0.75 (5.91)***	0.41 (3.69)***	(+)
LogSchool	0.92 (6.83)***	0.98 (8.78)***	0.37 (2.04)*	(+)
LogPOP	6.70 (4.11)***	11.58 (3.50)***	7.70 (16.05)***	(+)
C	-1.43 (-3.33)***		3.36 (4.90)***	
Adj. R^2	0.92	0.98	0.96	

Dependent variable: LogFDI			
Independent Variables	OLS	Fixed Effects	Random Effects	Expected Sign
LM (χ^2)			0.910	
Hausman (χ^2)			80.580***	
Observations	262	262	262	

T-sT – statistics (heretoskedasticity corrected) are in round parentheses.

*/**/* – statistically significant at 1%, 5%, and 10% levels respectively. The LM test has χ^2 distribution and test the null hypothesis of non-correlation between non-observable individual effects and explanatory variables. The Hausman test has χ^2 distribution and tests the null hypothesis of non-correlation between non-observable individual effects and explanatory variables.

With fixed effects estimator the explanatory power is Adj. $R^2 = 0.98$. All explanatory variables are significant (LogGDP, LogTRADE, LogSchool, LogPOP at the 1% level), and LogKOF at 5% level. The hypothesis for market size (LogGDP) is according to the hypothesis formulate, i.e, the market size influences the decision of investors. For the coefficient of globalization (LogKOF), the literature predicts a positive sign. The result confirms the existence of such positive effect on the FDI. The variables openness trade (LogTRADE), human capital (LogSchool), and urban population (LogPOP) are significant with a positive expected sign.

It is usual in the foreign direct investment[2] literature to apply the GMM-System (Blundell and Bond 1998, 2000). The validity of instruments is tested using a Sargan test of over-identifying restrictions and serial correlation. First-order and second-order serial correlations in the first-differenced residuals is tested using m1 and m2 statistics (Arellano, Bond, 1991). The GMM system estimator is consistent if there is no second-order serial correlation in the residuals (m[2] statistics). The dynamic panel data is valid if the estimator is consistent. As in Leitao (2011b,c) we used the criterion of Windmeijer (2005) small sample correction to have consistent stand errors. The instruments in levels used are LogFDI(3,8), LogGDP(3,8), LogKOF(3,8), and LogPOP(3,8) for the first differences. For levels equations, the instruments are used first differences all variables t-2. As shown in Table 4, the equation presents consistent estimates; with no serial correlation for the GMM-SYS estimator (m[1], m[2], and statistics).The specification Sargan test shows there are no problems with the validity of the instruments used. For lagged dependent variable (LogFDIt-1), a positive sign was expected and the results confirm this.

According to Leitao (2011a) we can conclude that FDI has a positive impact on growth. The variable, LogGDP(income per capita), used also by Krugell and Naude (2007), and Maniam (2007) has a significant and predicited positive effect on FDI.

The index of globalization (LogKOF) presents a positive expected sign. The studies of Leitao (2011 a) and Dreher et al. (2008) found a positive correlation between globalization and FDI. According to this result, we can conclude that globalization manipulates the decision of foreign investors. The openness trade influences FDI positively. Our result is according to the hypothesis formulated. The vari-

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[2] Leitao (2011a).

able, human capital (LogSchool) presents a positive sign, confirming the theoretical forecast proposed by the literature. Carkovic and Levine (2002) found the same result. The coefficient of LogPOP (population) is positive as expected and significant at 1% level. This result demonstrates the importance of population in a host country. In the other words, population of a host country influences the decision of foreign investors.

Table 4. **Dynamic panel data: FDI and Globalization**

Dependent variable: LogFDI		
Independent Variables	GMM-System	Expected Sign
LogFDI$_{t-1}$	0.02 (1.97)*	(+)
LogGDP	0.15 (2.44)**	(+)
LogKOF	1.91 (2.31)**	(+)
LogTRADE	0.96 (3.18)***	(+)
LogSchool	0.79 (5.59)***	(+)
LogPop	8.33 (2.84)***	(+)
C	4.65 (2.69)***	
M1	0.76 [0.448]	
M2	0.52 [0.600]	
Sargan Test	25.07 [1.000]	
Observations	261	

The null hypothesis that each coefficient is equal to zero is tested using a second-step robust standard error. T-statistics (heteroskedasticity corrected) are in round parentheses. ***/**/* — statistically significant, at the 1%, 5%, and 10% levels, respectively. P-values are in brackets. Year dummies are included in all specification (this is equivalent to transformation the variables into each period). M1 and M2 are the tests for first-order and second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null hypothesis of no serial correlation (based on the efficient two-step GMM estimator). Sargan test is a test of over-identifying restrictions, asymptotically distributed under the null instruments' validity.

Conclusion. In this paper, we provide an overview of the development of foreign direct investments (FDI), including localization and institutional variables. In the context of economic globalization, cultural affinity, history and language can promote trade relations. The asymmetry of economic policy discourages bilateral trade relations. Globalization promotes bilateral trade between nations.

For the measurement of FDI we used a static and dynamic panel data analysis (GMM-system estimator). Our sample covers the time period from 1990 to 2008 for 33 countries. The empirical evidence demonstrate the noteworthy findings that need to be expressed in detail.

The lagged FDI variable presents an expected positive sign. According to this result we can conclude that foreign direct investment promotes growth and specialization between the countries.

Other explanatory variables as market size (GDP), openness trade and globalization are also statistically significant.

The human capital (School) is an important determinant of FDI. If we further use a panel data with more years and consider other explanatory variables perhaps we will have different results. Such further research might also include industry characteristics into the analysis in order to investigate the impact of industry-specific factors.

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