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   RESEARCH METHODOLOGY

   RESULTS & DISCUSSION

   FINDINGS

   RECOMMENDATIONS/SUGGESTIONS

   CONCLUSIONS

   SCOPE FOR FURTHER RESEARCH

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DETERMINANTS OF FOREIGN DIRECT INVESTMENT INFLOWS IN THE TRANSITION ECONOMIES OF EUROPEAN UNION

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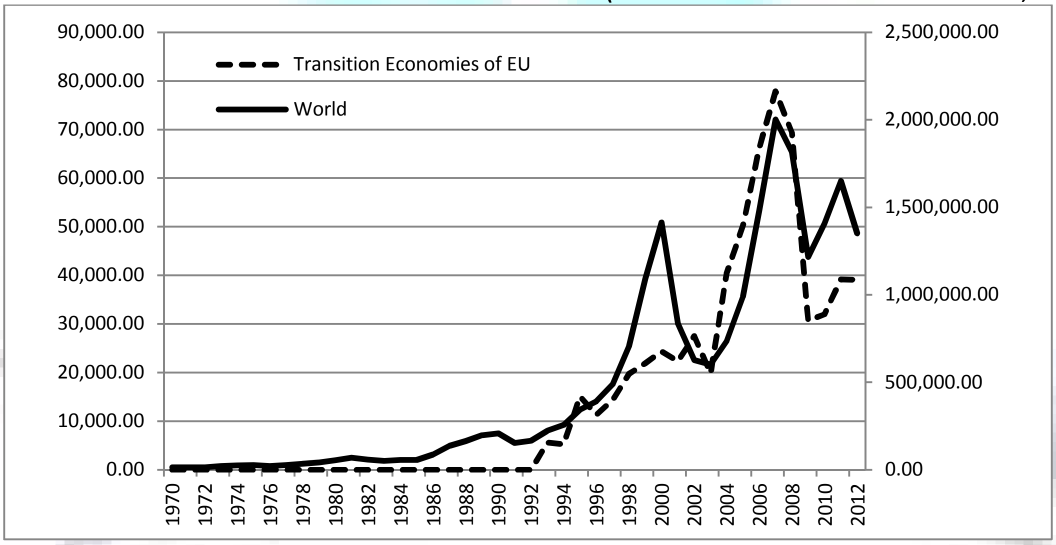
ABSTRACT
Foreign direct investment flows have increased together with the economic globalization and technological advances in the fields of information, communication and transportation since 1980s and foreign direct investment flows played a key role in rapid growth of some countries. This study examines the major determinants of foreign direct investment inflows in seven transition economies of European Union by using panel data regression model during the period 1997-2011. We found that there was a positive relationship between foreign direct investment inflows and economic growth, trade openness, infrastructure and financial development, while there was a negative relationship between foreign direct investment inflows and inflation, taxes.

KEYWORDS
Foreign direct investment inflows, Transition economies, Panel regression.

INTRODUCTION
Foreign direct investment (FDI) flows have increased since 1950s and accelerated especially after 1980s due to increasing economic and financial globalization. Although substantial fluctuations in FDI inflows were seen especially in early 2000s and 2008 due to financial crises, FDI inflows reached US$ 2 trillion in the world in 2007, but decreased to US$ 1.2 trillion with the negative effects of global financial crisis, and then have begun to increase.

On the contrary to the general FDI flows trend in the world, FDI inflows to the transition economies of the European Union (Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Slovenia) began belatedly because these countries had a centrally planned economy. These countries transited from centrally planned economy to free market and underwent economic liberalization with fall of the communism during the late 1980s and also began to participate to the European Union (EU) as of 2004 after completing the entry requirements. Transition from command economy to free market and entry to the EU caused FDI flowed into these countries. The FDI inflows to the transition economies of the European Union began to increase in early 1990s and accelerated in early 2000s until 2007 and reached about US$ 78 billion in 2007.

CHART 1: FDI INFLOWS IN THE WORLD AND TRANSITION ECONOMIES OF EU (US DOLLARS AT CURRENT PRICES IN MILLIONS, 1993-2012)



Source: UNCTAD, FDI Statistics.

The objective of this paper is to examine the major determinants of FDI inflows to the transition economies of EU. The rest of the paper is organized as follows. Section 2 summarizes the theoretical review and Section 3 reviews the empirical review. Section 4 presents data, method, empirical application and findings. Finally Section 5 concludes the study.

THEORETICAL REVIEW
Many theories have been developed to explain the motives behind FDI flows. Although the first studies on the FDI determinants date back to Adam Smith, Ohlin is one of the pioneers in this field and Mundell (1957) firstly explained cross-border capital flows by using Heckscher-Ohlin model. Later Kindleberger (1969) and Hymer (1976) developed multinational enterprises concept and they explained FDI by using monopolistic advantage concept. On the other hand Buckley and Casson (1976) introduced internalization concept and they explained the internalization decision of firms by using industry-specific factors including product

type, market type and economies of scale, regional factors including differences in distance and culture, national factors including political and financial factors and firm specific factors including management skills.
Dunning (1977) developed the OLI Ownership (firm specific advantages), Location (country specific advantages), and Internalization or eclectic approach in order to explain FDI. Firm specific advantages including human capital (managers), patents, technologies, brand, reputation etc. and these can be replicated in different countries without losing value and also transferred without high transaction costs. The cheap input factors, saving transport costs and eliminating trade barriers are locational advantages. Finally controlling, coordinating ownership and location specific advantages within the multinational enterprise rather than selling the right to use those advantages to domestic firms in the host country are the advantages of the internalization.
Dunning (1993) described three types of FDI such as market-seeking FDI/horizontal FDI/export-substituting FDI , resource-seeking FDI/vertical FDI and efficiency-seeking FDI depending on the motives behind the FDI flows. Availability of natural resources, cheap labor, creative assets and physical infrastructure are motives behind the vertical FDI while host country market size, per capita income and market growth are motives behind the horizontal FDI. The objective of the efficiency seeking is to take advantage of different factor endowments, cultures, institutional arrangements, economic systems and policies, and market structures by concentrating production in a limited number of locations to supply multiple markets.

EMPIRICAL REVIEW

There have been extensive empirical studies on the determinants of the FDI in the literature. Studies have reached many possible determinants of FDI inflows such as market size, population, growth prospects, financial development, inflation, real exchange rate, openness, trade openness, human capital, institutional quality, infrastructure, political stability and taxes. The effects of possible determinants on FDI inflows have been found different depending on countries and country groups. Main findings of these studies are presented in the Table 1.
The effects of GDP and GDP growth rate, trade openness, infrastructure on FDI inflows have been mostly found to be positive while the effects of tax rate on FDI inflows have been mostly found to be negative. On the other hand the studies have reached mixed results for the effects of inflation rate, labor cost, balance of payments, current account balance, foreign exchange reserves, and financial development as seen in Table 1.

TABLE 1: RECENT STUDIES ON THE DETERMINANTS OF FDI INFLOWS

FDI Determinants	Positive	Negative	Insignificant/No impact
GDP (Gross Domestic Product)	Khachoo and Khan (2012), Sahni (2012), Ranjan and Agrawal (2011), Azam (2010), Mottaleb and Kalirajan (2010), Mounter and Wijeweera (2008), Kersan-Škabić and Orlić (2007), Hara and Razafimahefa (2005), Tsen (2005), Nonnemberg and Mendonça (2004), Dunning (1980)		Shahmoradi et al. (2010)
GDP growth rate	Shahzad and Al-Swidi (2013), Özcan and Arı (2010), Mottaleb and Kalirajan (2010), Nonnemberg and Mendonça (2004)		
Inflation rate	Saleem et al. (2013), Sahni (2012), Tripathiet al. (2012), Özcan and Arı (2010)	Azam (2010), Demirhan and Masca (2008), Tsen (2005)	Omankhanlen (2011), Kersan-Škabić and Orlić (2007)
Trade openness	Sahni (2012), Anyanwu (2011), Tripathi et al. (2012), Ranjan and Agrawal (2011), Demirhan and Masca (2008), Kersan-Škabić and Orlić (2007), Botric and Škuflic (2006), Nonnemberg and Mendonça (2004)	Özcan and Arı (2010), Mounter and Wijeweera (2008)	
Financial development	Sghaier and Abida (2013), Pindzo and Vjetrov (2013), Kaur et al. (2013)	Anyanwu (2011), Walsh and Yu (2010)	
Physical infrastructure	Pindzo and Vjetrov (2013), Khachoo and Khan (2012), Ranjan and Agrawal (2011),Özcan and Arı (2010),Demirhan and Masca (2008), Kersan-Škabić and Orlić (2007), Tsen (2005)		
Tax rate		Demirhan and Masca (2008), Kersan-Škabić and Orlić (2007), Grubert and Mutti (1991)	

DATA, METHOD, EMPIRICAL APPLICATION AND FINDINGS

We examined the major determinants of FDI inflows in seven transition economies of EU including Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia and Slovenia during the period 1997-2011 by using panel regression analysis. Our data was obtained from the Financial Development and Structure Database and the World Development Indicators (World Bank 2013a&2013b). The variables, their symbols and their sources were presented in Table 2. Eviews 7.1 and Stata 10.0 statistical packages were used in the econometric analysis.

TABLE 2: VARIABLES USED IN THE ECONOMETRIC ANALYSIS

Data	Symbol
FDI inflows (annual, % of GDP)	FDI
GDP growth (annual, %)	GDP
Trade openness (annual, % of GDP)	TO
Inflation, consumer prices (annual, %)	INF
Telephone lines (annual)	TL
Stocks traded, total value (annual, % of GDP)	ST
Taxes on income, profits and capital gains (% of revenue)	TAX
Domestic credit to private sector (% of GDP)	DC

PANEL UNIT ROOT TEST RESULTS

The variables in the empirical analysis should be stationary to avoid possible spurious real relationships among the variables. So we tested common unit root process by Levin, Lin and Chu (2002) test and unit root process for every unit by Im, Pesaran and Shin (2003). We tested stationarity of the series by Augmented Dickey Fuller (ADF) test. The results of the panel unit root tests were presented in Table 3. We found that all the variables were stationary at the first level.

TABLE 3: RESULTS OF PANEL UNIT ROOT TESTS

Variables	Levin, Lin & Chu Test Results		Im, Pesaran& Shin Test Results		ADF-Fisher Chi-square	
	Level	First Difference	Level	First Difference	Level	First Difference
	Trend and Constant	Constant	Trend and Constant	Constant	Trend and Constant	Constant
GDP	0.1977	0.0022*	0.2182	0.0001*	0.2541	0.0000*
TO	0.2234	0.0031*	0.2456	0.0066*	0.2784	0.0278*
INF	0.2601	0.0000*	0.2761	0.0000*	0.1955	0.0036*
TL	0.1712	0.0034*	0.1580	0.0099*	0.1278	0.0007*
ST	0.0988	0.0002*	0.1136	0.0251*	0.0936	0.0001*
TAX	0.2392	0.0051*	0.2764	0.0009*	0.3064	0.0390*
DC	0.3173	0.0000*	0.2877	0.0044*	0.2691	0.0000*
FDI	0.1405	0.0000*	0.1805	0.0000*	0.1792	0.0187*

The series were deseasonalized by Hodrick-Prescott filter during the stationarity analyses and periods of crisis and policy change were considered with regard to the statistical significance. In the model selection, trend and constant components were included in the model as long as they were they were significant.
* Significant at the 0.05 and 0.01 level, lags for ADF test were selected automatically by based on Schwarz information criterion, Bandwiths for Phillips-Perron test were selected automatically by based on Newey-West Bandwith.
Cusum path lies within the confidence interval bounds at %5, structural breakpoint was not observed.

The panel unit root tests in Table 3 are referred as first generation panel unit root tests, which are based on the assumption which cross-sectional units of the panel are independent and all the cross-sectional units are affected equally from the any shock which one of the panel units is exposed to. Whereas it is more realistic that the other units are affected from the shock which any one of the panel units is exposed to in different levels. The second generation panel unit root tests were developed to eliminate this shortcoming and they test the stationarity by considering the dependency among the cross-sectional units (Göçer, 2013:5094).

It is required to test the cross-sectional dependency in panel data set for determining the existence of unit root. If the cross-sectional dependency in panel data set is rejected, first generation panel unit root test can be used. However if there is cross-sectional dependency in the panel data, use of second generation panel unit root tests yield a more consistent, efficient and powerful estimation (Güloğlu and İspir, 2011:209–210).

We can determine the existence of cross-sectional dependency by Breusch-Pagan (1980) CD_{LM1} test in case of time dimension (T)> cross-sectional dimension (N), Pesaran (2004) CD_{LM2} test in case of T=N, by Pesaran (2004) CD_{LM} test in case of T<N. We used Breuschand Pagan (1980) CD_{LM1} to test the cross-sectional dependency because there are 7 countries (N=7) and 15 years (T=15). The hypotheses of the test are as follows:

H_0: There is no cross-sectional dependency

H_1: There is cross-sectional dependency

If the p value is smaller than 0.05, H_0 is rejected at 5% significance level and it is decided there is cross-sectional dependency among the panel units (Pesaran, 2004). The results of CD_{LM1} test were presented in Table 4. The results demonstrated that there was cross-sectional dependency in the series and equation because p value is smaller than 0.05. In this case there is cross-sectional dependency among the countries which formed the panel and all the other countries affected from the shock which any country was exposed to.

TABLE 4: RESULTS OF CD_{LM1} TEST

Test	GDP	TO	INF	TL	ST	TAX	DC	FDI
CD_{LM1}	6.008*	4.980*	7.556*	8.352*	5.921*	8.563*	9.563*	11.234*

*Significant at the 0.05 level

Since we found that there was cross-sectional dependency among the countries which formed the panel, we tested the stationarity of the series by cross-sectionally augmented Im-Pesaran-Shin (2003) (CIPS) based CADF (Cross-Sectionally Augmented Dickey-Fuller) which is one of the second generation unit root tests. The hypotheses of the test are as follows:

H_0: There is unit root and

H_1: There is no unit root.

CIPS statistics is calculated by taking arithmetic averages of the all CADF statistics to determine whether there is unit root in the overall panel. The calculated CIPS statistics is compared with the table value in Pesaran (2006) and if the calculated CIPS value is smaller than the table critical value, H_0 is rejected. In this case there is no unit root in relevant data of the countries and the shocks are temporary (Göçer, 2013:5094-5095).

CIPS statistics were calculated and the results were presented in Table 5. Since the calculated CIPS statistics is higher than the critical value in the table, H_0 is accepted and it was decided there was unit roots in the series which formed the panel. In this case the series were not stationary at the levels. So we made the regression analysis with first differences of the variables, because the serieswere not stationary at the level.

TABLE 5: RESULTS OF CIPS TEST

Test	GDP	TO	INF	TL	ST	TAX	DC	FDI
CIPS	7.536*	6.453*	7.990*	9.631*	5.903*	9.528*	9.672*	12.342*

PANEL REGRESSION

Panel data analysis is implemented by fixed and random effects as specified in Baltagi (2004). We applied some statistical tests to determine the estimation method which will be used in the analysis. The main issue is whether the data will be pooled among the countries and the periods because all the variables in the model may be varied among the countries and the periods. We used Chow test to determine common significance of country specific effects and time specific effects. The effective estimator under null hypothesis is pooled ordinary least squares, while effective estimator under alternative hypothesis is fixed effect model (Berke, 2009:41). We used Chow and Breush-Pagan tests to determine which panel regression model would be used and the results of the tests were presented in Table 6. Null and alternative hypotheses for BP tests respectively pooled regression and random effects model, while null and alternative hypotheses for Chow test respectively are pooled regression and fixed effects model.

TABLE 6: TEST RESULTS OF PANEL REGRESSION ESTIMATION METHOD

Test	p value	Decision
Chow(F test)	0.013	Accept H_1
BP(χ^2 test)	0.000	Accept H_1

We then used Hausman test to decide whether we use random effects model and fixed effects model.

H_0: There is random effects (random effects model)

H_1: There is no random effects (fixed effects model)

The results of Hausman test, which were presented in Table 7, demonstrated that null hypothesis was accepted. So we used random effects model in the analysis.

TABLE 7: RESULTS OF HAUSMAN TEST

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	546.990	3	0.224
Period random	498.324	3	0.197
Cross-section and period random	321.543	3	0.182

We used different algorithms for the analysis and the estimation results of the model obtained by panel-corrected standard errors (PCSE) algorithm which had minimum value of total squared error and the results of panel regression were presented in Table 8. We found that GDP, TO, TL, ST and DC had statistically significant positive effect on FDI, while INF and TAX had statistically significant negative effect on FDI. Moreover our explanatory variables explained 77.43 % of variation in dependent variable (FDI inflows). Also the coefficients showed that GDP, DC and TL were major determinants of FDI inflows.

TABLE 8: PANEL REGRESSION ESTIMATION RESULTS

Dependent Variable: DFDI				
Method: Panel EGLS (Two-way random effects)				
Periods included: 14				
Cross-sections included: 7				
Total panel (balanced) observations: 98				
Swamy and Arora estimator of component variances				
Cross-section SUR (PCSE) standard errors & covariance (d.f. corrected)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
DGDP	0.227681	0.048393	4.704836	0.0000
DTO	0.042613	0.017389	2.450561	0.0156
DINF	-0.080137	0.014324	-5.594574	0.0000
DTL	0.143482	0.065994	2.174174	0.0315
DST	0.023569	0.010329	2.281753	0.0241
DTAX	-0.013765	0.006638	-2.073682	0.0401
DDC	0.217282	0.078959	2.751842	0.0069
C	0.224203	0.068549	3.270699	0.0014
	Effects Specification			
			S.D.	Rho
Cross-section random			9.64882	0.7863
Period random			0.00000	0.0000
Idiosyncratic random			5.43582	0.1272
	Weighted Statistics			
R-squared	0.774367	Mean dependent var		2.546738
Adjusted R-squared	0.746642	S.D. dependent var		3.875645
S.E. of regression	2.879344	Sum squared resid		1083.324
F-statistic	34.88745	Durbin-Watson stat		2.89653
Prob(F-statistic)	0.000000			
	Unweighted Statistics			
R-squared	0.75232	Mean dependent var		34.989
Sum squared resid	1678.990	Durbin-Watson stat		2.7660

Autocorrelation is an important problem in the panel data analyses as in all the time series. One of the main assumptions of the regression analysis is that there should be not the relationship (correlation) among the same error terms for the different observations. If the error terms are interrelated, this is called as autocorrelation or serial correlation (Greene, 2011). We tested the autocorrelation in the data set by Woolridge (2002) autocorrelation test. The test result was presented in Table 9 and the null hypothesis, which states that there is no autocorrelation, was rejected according to the test results. In other words there was no autocorrelation among the error terms.

TABLE 9: RESULTS OF WOOLDRIDGE AUTOCORRELATION TEST

F value	Probability
567.982	0.1871

Heteroscedasticity was tested by Greene (2003) heteroscedastic test and the test result was presented in Table 10. H_0hypothesis, which states that there is no heteroscedasticity, was accepted according to the test results.

TABLE 10: RESULTS OF GREENE HETEROSKEDASTICITY TEST

chi2 (2) =543.772
Prob>chi2 = 0.1933

CONCLUSION

There have been significant increases in foreign direct investment flows in the world as of 1980s. But nonetheless transition economies belatedly began to attract FDI inflows due to their centrally planned economies. These countries transited from centrally planned economy to free market and underwent economic liberalization with fall of the communism during the late 1980s. This study examined the major macroeconomic determinants of foreign direct investment inflows in seven transition economies of European Union by using panel data regression model during the period 1997-2011.

We found that there was a positive relationship between foreign direct investment inflows and economic growth, trade openness, infrastructure and financial development, while there was a negative relationship between foreign direct investment inflows and inflation, taxes. Our findings on the relationship between FDI inflows and these variables are consistent with the general findings in the literature, because there was generally a positive relationship between FDI inflows and GDP growth, trade openness, physical infrastructure, financial development and a negative relationship between FDI inflows and taxes in the literature. On the other hand the studies have mixed finding on the relationship between FDI inflows and inflation. But a negative relationship between FDI inflows and inflation is significant from the point of economic theory as a sign of economic stability of the countries. Moreover we found that economic growth, financial development and infrastructure are dominant determinants of FDI inflows in transition economies of EU.

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