The Relationship between FDI and Regional Economic Integrations: An Empirical Analysis of BSEC Countries

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Abstract

This study investigates the effect of regional economic integration on foreign direct investment (FDI) in Organization of Black Sea Economic Cooperation (BSEC*) countries not only with theoretical point of view but also with empirical evidence. The effect of regional economic integration on FDI was empirically analyzed for 9 countries and the time period cover in this study is after the BSEC has been implemented. The model is estimated with panel data methods using a dummy variable for the regional economic integrations for the 1994-2013 periods. This paper is concerned with the effect of membership to regional economic integrations together with other factors has increased FDI flows. With the current increasing regionalization trend, this paper analyses that in order to attract higher amounts of FDI, developing countries should stress regional economic integration, or at least they should make regional trade agreements or free trade agreements.

Keywords: Foreign Investment, Economic Integration

JEL: F15, F21, C23

1. Introduction

Organization of Black Sea Economic Cooperation (BSEC) represents a region of some 350 million people with a foreign trade capacity of over USD 300 billion annually. Also it is the second-largest source of oil and natural gas along with its rich proven reserves of minerals and metals. Therefore it is becoming Europe's major transport and energy transfer corridor (http://www.bsec-organization.org). The main characteristic of these countries is their physical proximity. The Black Sea Region has long been a very critical and important

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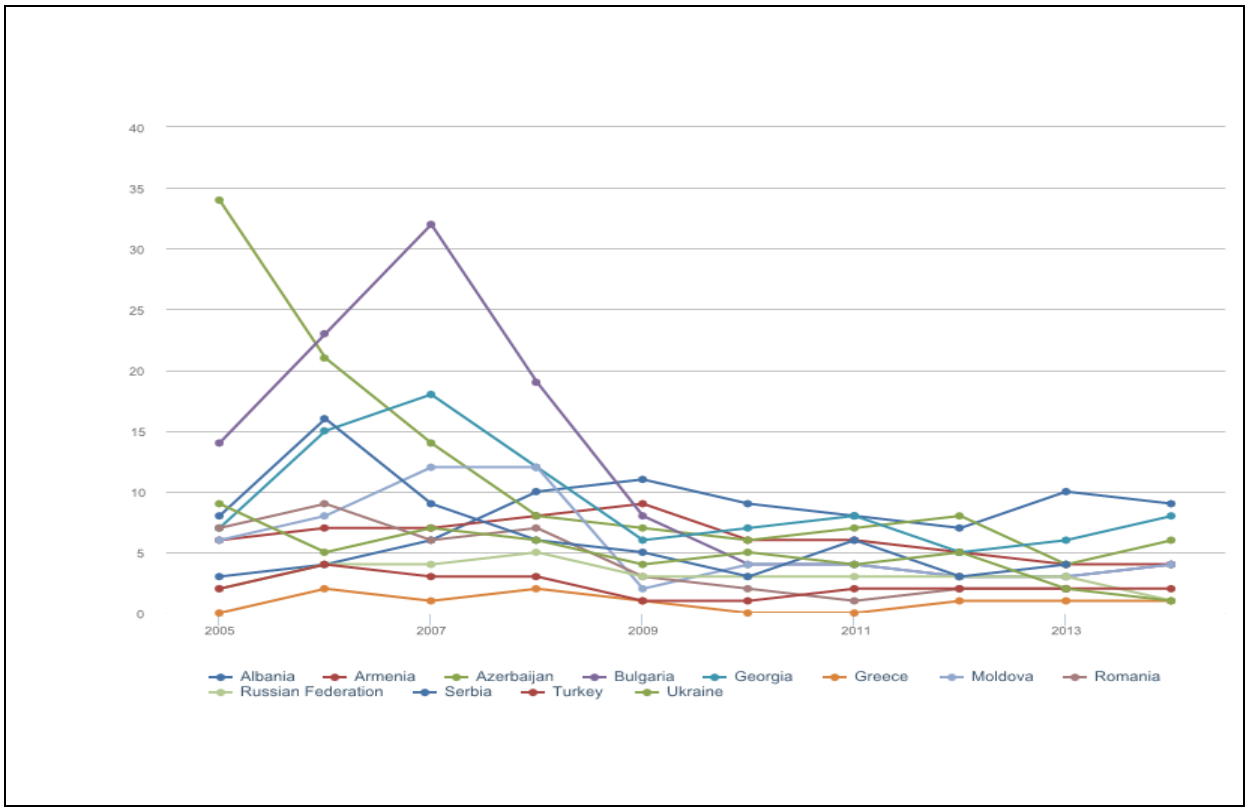
* The Founding Members of the Black Sea Economic Cooperation - the Republic of Albania, the Republic of Armenia, the Republic of Azerbaijan, the Republic of Bulgaria, Georgia, the Hellenic Republic, the Republic of Moldova, Romania, the Russian Federation, the Republic of Turkey, Ukraine and Serbia and Montenegro.

economic area; that is why some regional arrangements are brought to the agenda right after the end of Cold War. Besides this, Turkey is a founding *member of* integration.

Table 1 shows the international FDI net inflows (% of GDP) to BSEC countries for the period 2005-2013 based on World Economic Indicators.

Table 1: Foreign Direct Investment, net inflows (% of GDP)



Source: World Economic Indicators

As seen from the Table 1, FDI flows are very important percentage of GDP for each BSEC countries.

FDI flows were studied by many economists, such as Balassa (1974), Ozawa (1979) and Dunning (1980) in the frame of the causes, directions and consequences. Although the effect of regional integration on trade flows has been written much, there has been done little work on its effect on FDI.

This study is organized as follows. The next section includes theoretical approaches to the effects of regional economic integration on FDI followed by a review of empirical literature. The third section concerns the empirical analysis, and the final section is the conclusion.

2. Theoretical Framework

FDI is defined as “an investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy ([the] foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor ...” (UNCTAD, 2003).

International investment or capital flows have four categories, these are; commercial loans, official flows, FDI, and foreign portfolio investment (FPI). Commercial loans, which primarily take the form of bank loans issued to foreign businesses or governments. Official flows, which refer generally to the forms of development assistance that developed nations, give to developing nations. FDI pertains to international investment in which the investor obtains a lasting interest in an enterprise in another country. It is performed by buying or constructing a factory in a foreign country or adding improvements to such a facility, in the form of property, plants, or equipment. Regional economic integrations (RIAs) lead reductions of regional trade barriers and investment restrictions.

The interaction between regional economic integration and FDI has been examined in recent studies, which, suggest that there is a positive impact of economic integration on FDI. Blomström and Kokko (1997) investigate the channels of RIAs which affect FDI in their detailed study. Neary (2002) extends the theory of multinational corporations to explore the effects of internal trade liberalization by a group of countries on the level of inward direct investment. The majority of these findings consider some regions are more successful in attracting FDI than others. In addition, the most important regional economic integration is implemented between members of the same block of economies.

The empirical literature presents that RIAs enhance the flows of FDI. Levy Yeyati, et al., (2003) pointed out that the economic integration has a positive or negative effect on FDI among the member states. They suggested that the first positive effect is that; when considering international vertical division of labor strategy, different stages of intermediate goods are produced in different countries. So, firms can obtain profits through relatively low local prices. According to the vertical integration strategy of international firms, trade barriers will increase the transaction costs of vertical FDI. After a free trade agreement (FTA) is signed, reduction of tariffs and trade barriers allow firms to reduce transaction costs, which will lead firms to increase FDI. Second positive effect is that; the signing of the FTA integrates each country's divergent investment regulations and will also promote increased FDI. But the negative effect is that; when vertical FDI and merchandise trade share a mutual substitution relationship, then after the FTA is signed, inter-regional tariffs decrease and trade barriers are reduced, leading to a reduction in FDI. Also, according to the data on 122

developing nations from 1970 to 2000, Büthe and Milner (2008) suggested that; countries which joined to the WTO and other similar economic integration organizations had more opportunities to receive foreign investors' attention in comparison to countries that did not participate in such economic integration. Therefore, the amount of FDI into these countries significantly increased. Guerin and Manzocchi (2009) also examined FDI flows from developed countries into developing emerging countries from 1992 to 2004, and discovered that economic integration had a positive influence on FDI.

3. Model Specification, Metodology and Data

Current study primarily focuses on the investigation of main factors that drive inflow of foreign direct investments in BSEC Countries. The following model is formulated to determine the impact of different variables on FDI.

FDI_{it}= f (GDP, INF, ER, PCGDP, Dummy)

Where,

Fdı; is Foreign Direct Investment, net flows (BOP, current US$). The dependent variable, FDI, is measured as the net foreign direct investment inflow and is a widely used measure.

Gdp; is Gross Domestic Product (constant 2005 US$) proxy of economic growth. Economic growth as measured by GDP seems to be the most robust FDI determinant in econometric studies. This is the main determinant for horizontal FDI. It is irrelevant for vertical FDI. Jordaan (2004) mentions that FDI will move to countries with larger and expanding markets and greater purchasing power, where firms can potentially receive a higher return on their capital and by implication receive higher profit from their investments. Theoretically the level of FDI is positively related to the size of a foreign market. Therefore, we expect that the larger the market size, other things being constant, the more FDI the sector should attract. Thus the market size factor in our expectation should be positively related to the level of FDI.

Inf; is consumer price index proxy of macroeconomic stability. Indicates rising country's macroeconomic risk. The level of FDI is negatively related to the inflation rate.

Pcgdp; is per capita Gross Domestic Product (constant 2005 US$) proxy of market Size: The size of the host market, which also represents the host country's economic conditions and the potential demand for their output as well, is an important element in FDI

decision-makings. Moreover Scaperlanda and Mauer (1969) argued that FDI responds positively to the market size 'once it reaches a threshold level that is large enough to allow economies of scale and efficient utilization of resources'. The level of FDI is positively related to the pcgdp.

Er; is official exchange rate (LCU per US$, period average) proxy of investment climate. The level of FDI is positively related to the exchange rate.

Dummy is membership of economic integration (membership of BSEC). The level of FDI is positively related to the membership of an economic integration.

Our empirical model can be summarized by the following econometrical equation:

$$FDI_{i,t} = \alpha + \alpha 1(GDP)_{i,t} + \alpha 2(INF)_{i,t} + \alpha 3(PCGDP)_{i,t} + \alpha 4(ER)_{i,t} + \alpha 5(dummy) + \varepsilon_{i,t}$$

i stands for the cross sectional individual (i.e. country) and t for the time period.

We are interested in finding out how FDI depends on the economic growth, market size, macroeconomic stability, exchange rate and membership of an economic integration. Current study excludes some countries –Georgia, Hellenic Republic and Serbia -as they do not have sufficient data for analysis. Final sample of the study includes a strongly balanced panel data of 14 countries covering same period from 1994-2013. Out of these 14 countries; 9 countries are members of BSEC from 1992 including Albania, Armenia, Azerbaijan, Bulgaria, Moldova, Romania, Russian Federation, Turkey, Ukraine and rest of the 5 are non-members including Cyprus, Kazakhstan, Kyrgyz Republic, Mongolia, Pakistan. Data are taken from World Development Indıcators 2014- World Bank Database. All estimations were carried out using Stata. In all there are 240 observations.

Current study is employing the panel data which contains same cross-sectional units over a same time period. Panel data is a blend of both times series and cross-section data. (Wooldridge, 2009).

Gujarati (2002) stresses the advantages of using panel regression. There are three kinds of advantages. First advantage of using panel methods is that it is more informative with variability, reduce collinearity among the variable and give more degree of freedoms to the data. Second advantage is that it could construct better detection and measurement of effects that simply could not be observed in pure cross-sectional or pure time series data. Third advantage is that panel data is more informative than that of a time series since it gives more

data points which are able to be analyzed. Panel series provide the date to be available into several thousand units and this would minimize the bias that might result if individuals or firms level data are divided into broad aggregates.

There are several estimation techniques for conducting analysis with panel data but the two most known ones are the fixed effects model (FEM) and random effects model (REM). In FEM, the intercept in the regression model is allowed to differ among individuals in recognition to the fact that each individual or cross-sectional unit may have some unique characteristics of its own.

At the same time, REM assumed that the intercept of an individual unit is a random drawing from a much larger population with a constant mean value. A fixed effect model assumes differences in intercepts across groups or time periods, whereas a random effect model explores differences in error variances. The Hausman specification test compares the fixed versus random effects.

Fixed effects model is simply a model in which slope coefficients are constant while intercept varies across the cross-sectional unit in a panel. On the other hand random effects model is a model which treats cross-sectional unit as well as variation within cross-sectional unit in the model. The Random Effect Model (REM) estimates when unobserved heterogeneity is uncorrelated with any one of the explanatory variable in the model.

Dougherty (2007) recommended criteria for choosing a regression model in panel data, if authors choose random sample from population then they must utilize both panel data approaches fixed effects model and random effects model. Hausman test (the test statistics developed by Hausman has an asymptotic Chi-Square (X2) distribution) was used in order to decide which estimation technique is more appropriate between FEM and REM. If this test provides significant result then they should reject the following null hypothesis, "difference in coefficients not systematic". If the result of the Hausman's specification test gives an insignificant result then it is more appropriate to use random effects model instead of fixed effects model. Specifically, if it is assumed that ε_{it} and the **X's** (explanatory variables) are uncorrelated, REM may be appropriate, whereas if ε_{it} and the **X's** are correlated, FEM may be appropriate (Gujarati, 2002).

As in current study authors have drawn a random sample of 14 countries over the same time period of 1994-2013. So, along with recommended criteria for selecting an appropriate model for random sampling, authors have utilized both panel data approaches

fixed effects model and random effects model then Hausman's specification test was used to choose one most appropriate model from two models.

4. Empirical Results

After having the thorough discussion regarding the methods used in the current study we have reached on the following results. Several types of panel unit root tests are undertaken in this paper. The Levin, Lin, and Chu (2002) statistics, which has a common unit root process as its null hypotheses. The Im, Pesaran, and Shin (2003), and the Phillips-Perron (PP) Fisher Chi-square (Phillips & Perron, 1988) tests where the null hypothesis is an individual unit root process. The LLC test indicates that are stationary in levels, while the remaining variables are integrated of order one [I(1)] except lngdp. (see Table 2). The IPS and PPF tests indicate that all variables are stationary in levels except lngdp,lnpcgdp and er while all variables are integrated of order one [I(1)]. The LLC and IPS test with the model of constant and trend indicates that all variables are non-stationary in levels, while the all variables are integrated of order one [I(1)]. The PPF test indicates that lngdp and lninf are stationary in levels, while the remaining variables are integrated of order one [I(1)].

Table 2: Unit-Root Test Statistics.

	LLC		IPS		PPF	
Variables	**Constant**	**Constant and Trend**	**Constant**	**Constant and Trend**	**Constant**	**Constant and Trend**
FDI	0.21231 (0.5841)	0.60225 (0.7265)	-2.44630 (0.0072)	2.07412 (0.9810)	79.2402 (0.0000)	34.4405 (0.1867)
LNGDP	-1.60798 (0.0539)	2.93894 (0.9984)	2.76528 (0.9972)	0.77673 (0.7813)	0.38092 (1.0000)	69.9304 (0.0000)
LNINF	7.24052 (1.0000)	7.07485 (1.0000)	-11.3652 (0.0000)	-8.55792 (0.0000)	3687.47 (0.0000)	257.890 (0.0000)
ER	-3.48626 (0.0002)	-0.21652 (0.4143)	-1.35525 (0.0877)	1.70348 (0.9558)	68.8011 (0.0000)	15.1803 (0.9765)
LNPCGDP	2.72155 (0.9968)	-1.87465 (0.0304)	6.14960 (1.0000)	0.39601 (0.6540)	0.42016 (1.0000)	16.8865 (0.9508)
∆FDI	-7.21566 (0.0000)	-6.11419 (0.0000)	-6.98122 (0.0000)	-5.74148 (0.0000)	259.641 (0.0000)	257.890 (0.0000)
∆LNGDP	-0.96999 (0.1660)	-4.64722 (0.0000)	-2.40812 (0.0080)	0.76335 (0.7774)	121.301 (0.0000)	59.1542 (0.0005)
∆LNINF	-12.5253 (0.0000)	-8.86760 (0.0000)	-13.4177 (0.0000)	-8.88470 (0.0000)	3687.47 (0.0000)	342.123 (0.0000)
∆ER	-4.43642 (0.0000)	-4.23440 (0.0000)	2.75501 (0.0029)	-0.91516 (0.1801)	94.0953 (0.0000)	62.7898 (0.0002)
∆LNPCGDP	-5.76782 (0.0000)	-4.69969 (0.0000)	-2.66525 (0.0038)	-0.16500 (0.4345)	82.6364 (0.0000)	54.1337 (0.0022)

Note: The test statistics are reported above, along with the probability values in parentheses.

This section provides a detailed discussion of the regression results for both fixed effect model and random effect model in this study. The next two tables depict the outcomes of both panel data approaches. Table 3 describes the results of fixed effect model.

Table 3: Fixed effects (FE) model estimations

Variables	Coefficient	Std. Error	t	P-Value
LNGDP	1,9538	1,09211	1,79	0,075
LNINF	0,3568	0,44595	0,80	0,424
LNPCGDP	0,0238	0,00429	5,56	0,000
ER	0,6822	0,35533	1,92	0,056
Constant	-50,360	26,6092	-1,97	0,050

Not: R-sq within=0.1473, between= 0.0032, overall= 0.0182
F statistics=11,27 and Prob. > F=0,0000

From Table 3 it is clear that all the coefficients are statistically significant except variable of inflation. Variables of are GDP, per capita GDP and exchange rate are significant in this model while the variable of Inflation is not significant.

There is a positive relationship between FDI and GDP, ER and PCGDP in the model. Therefore, the lower percentage of inflation would be resulting higher FDI. The negative results imply that macroeconomic stability is the crucial determinant of FDI. The positive result implies that an increase (decrease) in GDP, PCGDP and ER enhances (reduce) the dependent variable FDI.

The within R2 of this model is 14 %. Within R2 means that independent variables explain 14 % variations in the FDI in this panel from year to year. Model is a good fit as F test 11.27 is significant at 1% level of significance.

Table 4: Random effects (RE) model estimations

Variables	Coefficient	Std. Error	z	P-Value
LNGDP	1,128951	0,1057508	10,68	0,000
INF2	-0,000862	0,0003366	-2,56	0,010
LNPCGDP1	0,155254	0,0824401	1,88	0,060
ER	0,001878	0,0006332	2,97	0,003
DUMMY1	0,168492	0,4186398	0,40	0,687
Constant	-8,053228	2,545135	-3,16	0,002

Not: R-sq within=0.3413, between= 0.7873, overall= 0.4976
Wald chi2=143.43, Pob.>chi2=0.0000

Results of random effects model is provided in Table 4. Variables size of GDP, INF, ER and PCGDP are significant in this model while dummy is not significant. There is a positive relationship between FDI and GDP, PCGDP and ER variables. On the other hand

there is negative relationship between FDI and INF. The within R2 of this model is 0.34 %, between R2 is 78% while overall R2 of panel is 49%. This model is also significant as its Wald chi2 143.43 is also significant at 1% level of significance. Within R2 of random effects model is higher as compared to fixed effects model, and also alternatively between R2 and overall R2 of random effects model are greater than fixed effects model.

As both of the above model are significant at 1% level of significance, so it is very hard to decide which model is appropriate. To handle this problem authors run a Hausman's specification test in order to decide one appropriate model out of two possible options. To choose FEM or REM the Hausman test should be used which has an asymptotic chi-square distribution. The statement of hypothesis related to FEM and ECM (Error Component Model).

H0: FEM and ECM estimators do not differ substantially
H1: FEM and ECM estimators differ substantially

Table 5: Hausman Test Results

	Fixed Effects	Random Effects	Difference	Prob>Chi2
LNGDP	1,9538	1,1289	1,0875	
LNINF	0,3568	-0,0008	0,0042	0
ER	0,0238	0,0187	0,3456	
LNPCGDP	0,6822	0,1552	0,2569	

The outcomes of this test are provided in Table 5. These outcomes suggest that most appropriate model is fixed effect model. The table 5 shows the value of chi-square which indicates that we reject the null hypothesis that the country random effect model is more consistent and accept the alternative hypothesis that the country fixed-effects model is consistent and efficient.

5. Conclusion

In this study, the effect of regional economic integration on FDI was empirically analyzed for 14 countries and the time period cover in this study is after the BSEC has been implemented. In an attempt to examine the determinants of FDI in BSEC countries, the panel data techniques have been employed. The model is estimated with panel data methods using a dummy variable for the regional economic integrations for the 1994-2013 periods. Table 3 presents the estimate of fixed effects as well as random effects models for the selected countries. Two most applicable panel data techniques (fixed effects and random effects

models) are utilized to investigate the determinants of profitability and Hausman's specification test recommended that fixed effects model is most appropriated model in this study. The fixed effects model has four significant variables which include economic growth, market size and exchange rate while only one variables inflation is insignificant.

This paper is concerned with the effect of membership to regional economic integrations together with other factors has increased FDI flows. According to the empirical results, it is shown that in order to attract higher amounts of FDI, developing countries should stress regional economic integration, or at least they should make regional trade agreements or free trade agreements.

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