LONG-TERM IMPACT OF FOREIGN DIRECT INVESTMENT ON UNEMPLOYMENT REDUCTIONRATE IN THE WESTERN BALKANS COUNTRIES

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Abstract

The main objective of this paper is to investigate the long-term relationship between foreign direct investment (FDI) and unemployment in the countries of the Western Balkans (WB). The study used panel data time series at the intervals from 1998 to 2012. In addition, sophisticated panel data models, such as panel unit root, co-integration,vector error correction model (VECM) and Granger causality test have been used. Results showed that there is a long-term relationship and co-integration between FDI and unemployment, and that FDI positively influence the reduction of unemployment in most countries of the WB. In the case of Granger causality test, there is causality between the observed variables in the long run.

Keywords

Foreign Direct Investment, Unemployment, Causality, Panel, Co-integration.

JEL Classification

F, F21

Introduction

Foreign direct investment (FDI) is an important driver of economic development in the Western Balkans (WB).In the period from 1997 to 2007, 68.32% of total FDI was directed towards developed economies, 29.27% to developing countries, and only 2.39% to the countries of Eastern Europe and the WB (Josifidis et al. 2011). Share of South East Europe countries in total FDI inflows into transition economies increased from 9.4% in 2000 to 14.7% in 2010. Amount of 5.8% refers to the WB countries (Estrin and Uvalic, 2013). In the period from 1989 to 2006, foreign investors have invested about 31.2 billion dollars in the entire region of the WB, which was about 1.450 per capita, while for ten new EU member states it was about 4.700 dollars per capita. The largest percentage of investment or 44% is invested in Croatia, 32% in Serbia, and26% in the remaining four countries. During the period, from 1989 to 2006, the total cumulative investments amounted to 5.2% in Macedonia, 6.7% in Albania and 8.6% in B&H. Condition of FDI per capita for the observed period is little bit different. Croatia has made 3.067 dollars, Montenegro 2.009 dollars, Serbia 1.312 dollars, while other countries in the region had inflows of FDI per capita less than 1,000 dollars (Skuflic, 2010).

The labour market in the countries of the WB is characterized by stagnant and high long-term unemployment. The transition has left strong structural problems that have caused a high rate of unemployment, i.e. non-existence of adequate skills needed for the labour market. All WB countries are faced with a high rate of long-term unemployment,which ranges over 80%, in particular, Albania, Macedonia, Bosnia and Montenegro, while Croatia has the lowest long-term unemployment rate of less than 60% (Nero, 2010).According to data from the Labour Force Surveys (LFS), the WBcountries had growing unemployment rates. In these countries, there was in total 2.433.706 unemployed. The average unemployment rate in the region is 26.8%. Youth unemployment rate in 2012 for the age group 15-25 amounted to 63.1% in B&H, 41% in Montenegro, 45.2% and 48.4% in Croatia and Serbia(Bartlett and Prica, 2013).

In line with the defined problem, the main objective of this study is to determine whether there is a long-term relationship between foreign direct investment and unemployment in the countries of the WB. In the research we came up with the results which suggest that there is long-term and positive impact of FDI on employment. Accordingly, the governments of the WB countries should undertake certain reforms of eliminating administrative barriers in order to enable inflow of FDI which will stimulate export trade, encourage domestic consumption through the implementation of appropriate macroeconomic policies, as well as increase capital investment in infrastructure and reduce the unemployment.

In our research we start with H_0hypothesis that there is no long-term relationship between FDI and unemployment in the WBcountries, i.e.H_0:α_1=1. In addition, we set up an alternative hypothesis that there is a long-term relationship between FDI and unemployment in the WBcountriesH_1:$\alpha_1 < 1$.

The papers structured as follows. The introduction section presents the subject and objectives of the research as well as hypotheses. The second section provides an overview of literature or studies that are closely related to the topic. The third section describes the research methodology and the database fromwhich the figures were used. The fourth section presents the empirical results of the paper. At last, the fifth section oncludes the paper.

Literature review

Over the last decade a few studies pertaining to the impact of FDI on the rate of unemployment in transition and developed countries were conducted. Ciftcioglu et al. (2007) in their study, they applied a panel data analysis to determine the effect of net FDI on GDP in nine countries in the period from 1995 to 2003. Within the panel data analysis, they applied the fixed effects model and pooled classical regression and found that economic growth and the unemployment rate negatively affects the growth of net FDI inflows and GDP, while the openness of the economy shows positive correlation.Aktar et al. (2008) scrutinized the impact of FDI, economic growth, and total fixed investment on unemployment in Turkey in the period from 1987 to 2007.In the exploration they applied

Johansen co-integration technique to calculate long-term relationship between the observed variables. Results showed that there are two co-integration vectors during the period in Turkey. Jude and Silaghi Pop (2010) examined the impact of FDI on reducing unemployment rate and growth boost in Central and Eastern Europe. In particular, they probed the effects of FDI on employment growth in host countries, i.e. determining the positive and negative effects. In addition, they investigated the factors that determine the relation between the employment and FDI. Rizvi and Nishat (2010) examined the impact of FDI on growth of the unemployment rate in Pakistan, India and China in the period from 1985 to 2008.In the study, they used the Im-Pesaran-Shin (IPS) and Pedroni tests. Applying the above tests, they have revealed that there is a long-term relationship between the variables, i.e. the strong impact of FDI on unemployment in these countries. Balcerzak and Zurek (2011) examined the impact of FDI on the unemployment rate in Poland. In the research, they applied the VAR techniques and analysed the period from 1995 to 2009. Results showed that FDI leads to a decrease in the unemployment rate in Poland, although it's a short-term effect. Mucuk and Demirsel (2013) investigated the relationship between FDI and unemployment rates in seven developing countries. They applied panel unit root, panel co integration and panel causality tests. Research has shown that FDI leads to an increase in employment rates in Turkey and Argentina, while in Thailand, leading to decrease. In fact, they found that there is a long-term causality or causality between the observed variables. Hisarciklilar et al. (2013) explored the impact of FDI on reduction of the unemployment rate in Turkey in the period from 2000 to 2007. They applied a panel data analysis and came to a result that indicates that there is a negative relationship between FDI inflows and reducing unemployment rate. Jaouad (2014) scrutinized the impact of FDI on unemployment in host countries. The research applied a panel co-integration test and came to certain results which show that FDI has a negative effect on unemployment in KSA both in the short as well as long term.

Methodology and data

This research refers to the empirical analysis of the measurement of long-term impact of FDI on reduction of unemployment in six countries of the WB. In the panel data analysis, we used the data within the time intervals from 1998 to 2012. Data were taken from the database of World Bank. Moreover, in our empirical analysis, we started from a simple regression model in which we have only two variables, i.e. we determined that the dependent variable is the unemployment rate (UNPL) and the independent variable is FDI.

$$UNPL_{it} = \beta_0 + \beta_1 FDI_{it} +, \dots, +\varepsilon_{it}. \qquad (1)$$

Our empirical analysis consists of the panel unit root.Asthe panel unitroottestswilluse the Levin, Lin and Chu (LLC), Im, Peseran and Shin (IPS), Hadritest andcombining p-valuestates. LLC test (2002) argued that individual unit root tests have limited power against alternative hypotheses with highly persistent deviations from equilibrium. This is particularly severe in small samples. LLC suggest a more powerful panel unit root test than performing individual unit root tests for each cross-section. The null hypothesis is that each individual time series contains a unit root against the alternative that each time series is stationary. We will introduce the LLC test with the following model (Baltagi, 2005):

$$\Delta y_{it} = py_{i,t-1} + \quad {}_{L=1}^{\rho_i} \theta_{i\,L} \Delta y_{it-L} + \alpha_{mi} d_{mt} + e_{it} \; m = 1,2,3 \qquad (2)$$

Withd_{mt}indicating the vector of deterministic variables and d_{mi}mi the correspondingvector of coefficientsformodel $m = 1,2,3$.In particular,$d_{1t} = empty\ set$,$d_{2t} = 1$ i $d_{3t} = 1, t$.
Since the lag order $p_i$is unknown, LLC suggest a three-step procedure to implement the test. The approach is mostly described as a three-step procedure with preliminary regressions and normalizations necessitated by cross-sectional heterogeneity. The firststep is to perform a specialaugmentedDickey-Fuller (ADF) regression for eachcross-section. The second step is to obtain an estimate of the ratio of the long-run variance to the short-run variance of Δy_{it}it, or equivalently ofu_{it}it. The third step is to compute t-statistic (Hlouskovaand Wagner, 2005). LLC test is restrictive in a sense that it requires ρ to be homogenous across$i$ (Baltagi, 2005). Im, Pesaran and Shin test allow for heterogeneous coefficient of $y_{it-1}$and proposes an alternative testing procedure based on the augmented DF tests when $u_{it}$is serially correlated with different serial correlation properties across cross-sectional units, i.e., $u_{it} = \sum_{j=1}^{pi} \psi_{it} u_{it-j} + \varepsilon_{it}$. Substituting this$u_{it}$in equation (1), we get (Chen,2013)

$$y_{it} = \rho_i y_{it-1} + \sum_{j=1}^{\rho i} \psi_{it}\, u_{it-j} + \alpha_{mi} + \varepsilon_{it}, i = 1, \dots, N, t = 1, \dots, T. \quad (3)$$

The null hypothesis is,$H_0: \rho_i = 1$all i against the alternative hypothesis $H_1: \rho_i < 1$ for at least *i*. The T-statistic suggested by IPS is defined as

$$\bar{t} = \frac{1}{N} \sum_{i=1}^{N} t_{\rho i}. (4)$$

Where $t_{\rho i}$ is the individual $t - statistic$ of testing $H_0: \rho_i = 1$. It is known that for a fixed N,

$$t_{\rho i} \Rightarrow \frac{\int_0^1 W_{iZ} dW_{iZ}}{\left(\int_0^1 W_{iZ}^2\right)^{1/2}} = t_{iT}. (5)$$

as $T \to \infty$. IPS assume thatt_{iT}has finite means and variances. Then

$$\frac{\sqrt{N}\left(\frac{1}{N}\sum_{i=1}^{N} t_{iT} - E\left[t_{iT} \mid \rho_i = 1\right]\right)}{\sqrt{var\left[t_{iT} \mid \rho_i = 1\right]}} \Rightarrow N(0,1). (6)$$

as $N \to \infty$by the Lindeber-Levy central limit theoremor limitations.Hence, the$t - statistic$of IPShas the limiting distribution as

$$t_{IPS} = \frac{\sqrt{N}\left(\bar{t} - E\left[t_{iT}/\rho_i = 1\right]\right)}{\sqrt{var\left[t_{iT}/\rho_i = 1\right]}} \Rightarrow N(0,1). (7)$$

as $T \to \infty$ followed by $N \to \infty$,sequentially. The values of $E[t_{iT}/\rho_i = 1]$ and $\sqrt{var[t_{iT}/\rho_i = 1]}$ have been computed by IPS via simulations for different values of T and p_i's(Baltagi, 2005).
Hadri proposes a residual-based Lagrange multiplier test for the null hypothesis that the individual series y_{it} $za\ i = 1, \dots, N$ are stationary around a deterministic level or trend, against the alternative of a unit root in panel data.
In addition,he considers the two following models:$y_{i,t} = r_{i,t} + \varepsilon_{i,t}$(6) and$y_{i,t} = r_{i,t} + \beta_i t + \varepsilon_{i,t}$ (8) where $r_{i,t}$is a random walk $y_{i,t} = r_{it-1} + u_{i,t,} u_{i,t}$ is independent and identically distributed*i.i.d.* $(0, \sigma_u^2)$,$u_{i,t}$ *and* $\varepsilon_{i,t}$*are being independent. The null-hypothesis can thus be stated as* $\sigma_u^2 = 0$. *Moreover, since* $\varepsilon_{i,t}$*are assumed* $i.i.d.$, *then under the null hypothesis,* $y_{i,t}$*is stationary around a deterministic level in model (6) and around deterministic trend in model (7)* (Hurlinandand Mignon, 2007). Also, ε_{it} and $u_{it}$are $i.i.d.$, independently and identically distributedacross $i$and over t, with $E[e_{it}] = 0, E[\varepsilon_{it}^2] = \sigma_\varepsilon^2 >$

$0, E\ u_{it}\ = 0, E\ u_{it}^2\ = \sigma_u^2 \geq 0, t = 1, \ldots, T\ and\ i = 1, \ldots, N$. Let$\varepsilon_{it}^u\ \varepsilon_{it}^T$ be the residuals from the regression y_i on an intercept, for model1, an intercept and a linear trend term for model 2. Let$\sigma_\varepsilon^2 \mu\ (\sigma_\varepsilon^2 t\ )$be a consistent estimator of the error variance (corrected for degrees of freedom) from the appropriate regression, which are given by (Giulietti et al. 2007)

$$\sigma_\varepsilon^2 u = \frac{1}{N(T-1)} \sum_{i=1}^{N} \sum_{t=1}^{T} \varepsilon_{it}^{u2}. \quad (9)$$

and

$$\sigma_\varepsilon^2 t = \frac{1}{N(T-2)} \sum_{i=1}^{N} \sum_{t=1}^{T} \varepsilon_{it}^{T2}. \quad (10)$$

Also, letS_{it}^l be the partial sum process of the residuals. Then the LM statistic is

$$LM_l = \frac{\frac{1}{N} \sum_{i=1}^{N} \frac{1}{T^2} \sum_{t=1}^{T} s_{it}^{l\,2}}{\sigma_\varepsilon^2 l}, u, \tau. (11)$$

Hadri test considers the standardised statistic

$$Z_\mu = \frac{\sqrt{N}\ LM_u - \varepsilon_u}{\varsigma_u} \Rightarrow N\ \ 0,1\ \ (12)$$

and

$$Z_\tau = \frac{\sqrt{N}\ LM_\tau - \varepsilon_\tau}{\varsigma_\tau} \Rightarrow N\ \ 0,1\ \ (13)$$

*Combining p-value tests.*Let$G_{i,Ti}$be a unit root test for$i$-th group inequation (1) and$T_i \to \infty$, $G_{i,Ti} \Rightarrow G_i$. Besides, let p_i be$p - value$of a unit root testa for cross-section i, i.e., $p_i = 1 - F\ \ G_{i,Ti}$, where$F\ \cdot$ is the distribution function of the random variableG_i.
Wehighlightthat the null-hypothesis of theunitroot test isnotrejectedwhen the *p-value* is largerthan 0.05%, if the significancelevelis set at 95%. In contrast, the null-hypothesis is rejectedwhen *p-value* is smallerthan 0.05%. Fisher type test is (Baltagi, 2005)

$$P = -2 \sum_{i=1}^{N} lnp_i (14)$$

which combines the$p - values$ from unit root testsfor eachcross-section i to test for unit rootin panel data. This means that$P$ is distributed as$\chi^2$with$2N$degrees of freedom as$T_i \to \infty$for finite$N$.
When$p_i$closes to 0 (null-hypothesis is rejected), $\ln p_i$ closes to$-\infty$ so that large value$P$ will be found and then the null-hypothesis of existing panel unit root will be rejected. In contrast, whenp_i closes to 1 (null-hypothesis is not rejected), $\ln p_i$closes to 0 so that small value$P$ will be found and then the null hypothesis of existing panel unit root will not be rejected.When N is large, Choi (1999) proposed aZ test

$$Z = \frac{1}{2}\sqrt{N} \sum_{i=1}^{N} (-2 \ln p_i - 2) (15)$$

since$E\ -2lnp_i\ = 2$ and$var\ -2lnp_i\ = 4$. Assumep_i's are i.i.d. (independent and identically distributed) and useLindeberg-Levy central limit theorem to get$Z \Rightarrow N\ \ 0,1$, as$T \to \infty$, followed by$N \to \infty$(Chen,2013).

The empirical results

In ourstudy, weperform detesting such as LLC, IPS, FisherChi-squareandHadritestsusing panel unit root test. In the context of time series, it is necessary to determine the presenceof data stationary in order to thereby eliminatepotentiallyseregressionbetween the variableswithin the timeandcross-sectionanalysis. In Table 1, wecansee the results of panel unitroot test.

Table no. 1Cumulative results of panel unit root test

Series: D(UNPL)				
Sample: 1998 2012				
Exogenous variables: Individual effects				
Automatic selection of maximum lags				
Automatic lag length selection based on SIC: 0 to 2				
Newey-West automatic bandwidth selection and Bartlett kernel				
Method	**Statistic**	**Prob.****	**Cross sections**	**Obs**
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.47818	0.0000	6	75
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.27831	0.0000	6	75
ADF - Fisher Chi-square	55.1244	0.0000	6	75
PP - Fisher Chi-square	68.3886	0.0000	6	78
** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution.				
All other tests assume asymptotic normality.				
Source: Author's Note: ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.				

Based on the calculated$p-value$, which is 0.0000% for LLC and IPS, we can conclude that it is a value that is far less than the accepted critical $p-value$ of 0.05%. This means that in the case of LLC and IPS test we can reject the null hypothesis and conclude that the given tests do not have a unit root. Also in the case of ADF, Fisher Chi-square and PP Fisher Chi square$p-value$ is very low and amounts 0.0000%, which is lower than the set critical value of 0.05%, and therefore we conclude that we can reject the null hypothesis. In the panel unit root test, we introduced the first difference which caused the time seriesdatato be stationary. In addition, within the panel unit root we tested onlyHadri test and come up with some results. A low $p-value$of 0.0000% was obtainedinHadri Z-statand Heteroscedastic Consistent Z-stat, which entitles us to reject the null hypothesis and conclude that the time-series and cross-sectional data are stationary (Table 2). Based on this, it follows that there is a long-term relationship between FDI and unemployment.

Table no. 2 Results of Hadri test

Null Hypothesis: Stationarity			
Series: D(UNPL)			
Sample: 1998 2012			
Exogenous variables: Individual effects, individual linear trends			
Newey-West automatic bandwidth selection and Bartlett kernel			
Total (balanced) observations: 84			
Cross-sections included: 6			
Method		Statistic	Prob.**
Hadri Z-stat		5.20874	0.0000
Heteroscedastic Consistent Z-stat		7.68388	0.0000
* Note: High autocorrelation leads to severe size distortion in Hadri test, leading to over-rejection of the null; ** Probabilities are computed assuming asymptotic normality			
Source: Author's Note: ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.			

Concluding remarks

In this study we investigated the long-term relationship or impact of FDI on reducing unemployment in the countries of the WB. In the studywe used panel data modelsuch as panel unitroot. Within the panel root, we tested Levin, Lin and Chu (LLC), Im, Peseran and Shin (IPS), Hadri test and combining p-value tests in order to determine whether there is a long-term impact of FDI on reducing unemployment in the WB. Results showed that the data is stationary and there is no unit root, and that there is a long term relationship, or the impact of FDI on reducing unemployment in the countries of the WB.

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