THE IMPACT OF FDI INFLOW ON EX-YUGOSLAV COUNTRIES’ LABOUR MARKETS

Abstract:
This paper models and discusses the effects of FDI inflow on the employment rate and average net wages in ex-Yugoslav countries. The sample of countries is chosen due to the high legacy with FDI, both in transitional (Bosnia and Herzegovina, Macedonia, Montenegro and Serbia) and recently developed (Croatia and Slovenia) economies. This paper argues that FDI inflow should have positive effects on the employment rate and on average net wages in the countries examined. Performing linear mixed-effects models on 78 observations in the period 2003–2017, the empirical results indicate that FDI inflow has positive and significant effects on the employment rate and on average net wages, after 2 years and after 3 years, respectively.

Keywords:
average net wage, employment rate, ex-Yugoslavia, linear mixed models, random effects.

INTRODUCTION

Foreign Direct Investments (FDI) have grown rapidly worldwide during the last few decades, although in 2017 the global flow of FDI in developing countries decreased (UNCTAD, 2018). Not only is FDI inflow labelled as the key factor in global economic development, growth and integration (Bitzenis & Marangos, 2007), but it has also been adopted as a key strategy for the development of transitional economies (Dabla-Norris, Honda, Lahreche & Verdier, 2010).

The economic recovery and progress of ex-Yugoslav countries have been supported by different international institutions. Since the crash of the socialist and communist regimes in Yugoslavia, the emerging democracies have been quickly engaged in many aspects of globalization. FDI inflow is suitable for fighting the national economic dysfunction and recession after the recent wars and, according to Chandler (2007), after the Dayton agreement and migrations as well. Figure 1 presents trends in FDI inflow in the countries under examination.
Even as one of the key factors of globalization, FDI inflow creates employment and wage discrepancies (see part 2). In relation to this statement, the object of this research is to measure the effects of FDI inflow on labour market principal indicators. To the best of the author’s knowledge, the relationships between FDI inflow and the employment rate, and FDI inflow and average net wages in the countries of ex-Yugoslavia have not been tested yet, and this research is about to cover this gap in the literature. The other reason for selecting this sample of countries is because of its high legacy with FDI (Hadžić & Pavlović, 2011).

The aim of this paper is to measure the impact of percentage point changes in FDI inflow on percentage point changes in the employment rate and on percentage point changes in average net wages in ex-Yugoslav countries in the period 2003–2017. The expected overall results are the positive and significant effects of FDI inflow on both the employment rate and average net wages.

The structure of this paper is as follows. The second part presents the empirical evidence of the impact of FDI on the labour market. The third part presents the data and econometric models applied. The fourth section shows the estimation of the results and their interpretation, followed by discussion and conclusions as the last section of the paper.

**LITERATURE REVIEW**

Table 1 represents a summary of nine empirical studies of the impact of FDI on the labour market. There are seven additional studies of the effect of FDI inflow on wage inequality, which are chosen as representative studies for the approaches used and the results found.

Table 1 - Impact of FDI on labour market indicators – empirical studies

<table>
<thead>
<tr>
<th>Author</th>
<th>Methodology</th>
<th>The effect of interest and geographical scope</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gopinath &amp; Chen (2003)</td>
<td>OLS regression</td>
<td>Impact of FDI inward on wages in 26 countries</td>
<td>FDI inward was found to have negative effect on wage inequality</td>
</tr>
<tr>
<td>Taylor &amp; Driffield (2005)</td>
<td>Fixed-effects and GMM estimators</td>
<td>Impact of FDI inward on manufacturing industries shifts in demand towards higher skilled labour in UK</td>
<td>FDI inward was found to have negative effect on wage inequality</td>
</tr>
<tr>
<td>Figini &amp; Gorg (2006)</td>
<td>Fixed-effects and GMM estimators</td>
<td>Impact of FDI inward on wage inequality in 103 countries</td>
<td>FDI inward was found to have negative effect on wage inequality in developing countries, and positive effect in developed countries</td>
</tr>
<tr>
<td>Bhandari (2007)</td>
<td>OLS regression</td>
<td>Impact of FDI on wage inequality in transitional countries</td>
<td>FDI was found to have positive effect on average wages, and negative effect on wage inequality</td>
</tr>
<tr>
<td>Pajovic (2007)</td>
<td>Case study: analytical approach</td>
<td>Impact of Renault in Slovenia and the Slovenian government on the local economy</td>
<td>Positive spillover effects are: worker training, indirect job creation</td>
</tr>
<tr>
<td>Stanisic (2008)</td>
<td>Correlation analysis</td>
<td>Impact of FDI on economic growth in South European transition countries</td>
<td>FDI was found to have positive effect on employment</td>
</tr>
<tr>
<td>Driffield, Girma, Henry, &amp; Taylor (2010)</td>
<td>GMM estimators</td>
<td>Impact of FDI inward on wage inequality in UK</td>
<td>FDI inward nationally tends to increase wage inequality, while the local FDI inward tends to decrease wage inequality</td>
</tr>
</tbody>
</table>
Authors argue about the positive or negative impact of FDI on the indicators of the labour market. Whilst Sabic et al. (2012), Zdravković & Martinović (2016), Grahovac & Softić (2017), and Perić (2019) stress that there is no significant impact of FDI inflow on employment, Stanišić (2008), Jude & Silaghi (2016), and Pajović (2007) claim that FDI inflow has a positive impact on employment growth. As far as average wages are concerned, Bhandari (2007) and Kurtović, Talović & Dacić (2015) claim that there is an increase due to FDI inflow. In relation to predictions, the Variance Decomposition Test developed by Kurtović et al. (2015) showed that over the next 10 years the growth of average net wages will lead to increased FDI inflow, but that the increase in FDI inflow will not have a significant effect on average net wages.

This section shows that FDI has a slight positive effect on the employment rate and on average net wages in transitional countries. However, FDI inflow tends to increase wage inequality, as reported by Gopinath & Chen (2003), Taylor & Driffield (2005), Figini & Gorg (2006), Driffield et al. (2010), Halmos (2011), Zulfiu (2014), and Peric (2016). The results from the empirical literature appear homogeneous: companies under foreign ownership pay higher wages and require a skilled labour force.

On the basis of the results presented in Table 1, the overall impact of FDI inflow on ex-Yugoslav countries remained unknown despite previous research. This study will informal in the literature and contribute to the knowledge about the impact of FDI inflow in the countries under examination.

The following section presents the data used for modelling, the econometric methodology and empirical results. The model specification convention is based on Anderson (2013) and Heck, Thomas & Tabata (2014).

### DATA AND MODEL SPECIFICATION

This section presents the quantitative variables, a description of the data used for the analysis (3.1), and the specification of the chosen statistical models and the statement of the hypotheses (3.2).
DATA

For modelling FDI inflow in relation to the employment rate and average net wages in ex-Yugoslav countries, data was derived from secondary sources. Thus, the panel data for the period 2003–2017 is constructed with the information obtained from:

- Balance of payments, retrieved from the official site of each country’s national bank in the statistical database for FDI inflow, and
- Labour market section, retrieved from the official site of each country’s statistical office for both the employment rate and average net wages.

Table 2 presents the descriptive statistics for each factor of each country, produced in SPSS software based on 78 observations.

Table 2 – Descriptive statistics

<table>
<thead>
<tr>
<th>Descriptive Statistics</th>
<th>Statistic</th>
<th>N</th>
<th>Range</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Statistic</th>
<th>Std. Error</th>
<th>Statistic</th>
<th>Std. Error</th>
<th>Statistic</th>
<th>Std. Error</th>
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</thead>
<tbody>
<tr>
<td>Year</td>
<td>Statistic</td>
<td>78</td>
<td>14</td>
<td>2003</td>
<td>2017</td>
<td>2010.94</td>
<td>.439</td>
<td>3.876</td>
<td>15.022</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IFDI</td>
<td>Statistic</td>
<td>78</td>
<td>4577</td>
<td>-253</td>
<td>4323</td>
<td>1011.37</td>
<td>.110583</td>
<td>976.643</td>
<td>953831.152</td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆IFDI</td>
<td>Statistic</td>
<td>73</td>
<td>11.37</td>
<td>-1.91</td>
<td>9.45</td>
<td>.4539</td>
<td>.19529</td>
<td>1.66858</td>
<td>2.784</td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆IFDI_lag1</td>
<td>Statistic</td>
<td>66</td>
<td>11.37</td>
<td>-1.91</td>
<td>9.45</td>
<td>.4621</td>
<td>.21391</td>
<td>1.73783</td>
<td>3.020</td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆IFDI_lag2</td>
<td>Statistic</td>
<td>60</td>
<td>11.37</td>
<td>-1.91</td>
<td>9.45</td>
<td>.3739</td>
<td>.19633</td>
<td>1.52076</td>
<td>2.313</td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆IFDI_lag3</td>
<td>Statistic</td>
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<td>11.37</td>
<td>-1.91</td>
<td>9.45</td>
<td>.3939</td>
<td>.21615</td>
<td>1.58835</td>
<td>2.523</td>
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<td></td>
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<tr>
<td>EMPL</td>
<td>Statistic</td>
<td>78</td>
<td>37.60</td>
<td>24.50</td>
<td>62.10</td>
<td>43.2242</td>
<td>.99280</td>
<td>8.76819</td>
<td>76.881</td>
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<tr>
<td>∆EMPL</td>
<td>Statistic</td>
<td>72</td>
<td>1.26</td>
<td>-.42</td>
<td>.84</td>
<td>.0162</td>
<td>.01384</td>
<td>.11744</td>
<td>.014</td>
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<tr>
<td>ANW</td>
<td>Statistic</td>
<td>78</td>
<td>856</td>
<td>206</td>
<td>1062</td>
<td>535.05</td>
<td>26.545</td>
<td>234.442</td>
<td>.54963.249</td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆ANW</td>
<td>Statistic</td>
<td>72</td>
<td>.49</td>
<td>-.16</td>
<td>.34</td>
<td>.0425</td>
<td>.00836</td>
<td>.07091</td>
<td>.005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dev_st</td>
<td>Statistic</td>
<td>78</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>.37</td>
<td>.055</td>
<td>.486</td>
<td>.237</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Valid N (list-wise) = 54

Source: Author’s calculation

where:
- IFDI – Foreign Direct Investment Inflow in million EUR,
- ∆IFDI – Foreign Direct Investment Inflow change rate,
- ∆IFDI_lag1 – Foreign Direct Investment Inflow change rate after 1 year,
- ∆IFDI_lag2 – Foreign Direct Investment Inflow change rate after 2 years,
- ∆IFDI_lag3 – Foreign Direct Investment Inflow change rate after 3 years,
- EMPL – Employment rate,
- ∆EMPL – Employment rate change rate,
- ANW – Average Net Wages in EUR,
- ∆ANW – Average Net Wages change rate,
- DEV_ST – Developmental stage (economies in transition or developed economies, according to the United Nation’s World Economic Situation and Prospects (UN, 2018) country classification).

The above-listed abbreviations for the variables are used in the next subpart.

MODEL SPECIFICATION

Linear mixed-effects models (LMM) are used to estimate the overall impact of the changes in IFDI and DEV_ST on the changes in the employment rate (∆EMPL) and on the changes in average net wages (∆ANW) in the ex-Yugoslav countries in the period from 2003 to 2017. The changes in variables are measured in percentage points. The lagged terms are used because of the theoretical assumption that IFDI requires time to show the real effects of performing in the country. A typical assumption here is that the regression coefficients have normal distributions, as well as unstandardized coefficients, which means that the coefficients are in their original metrics. The information criterion used to search for the best model fit is Akaake’s Information Criterion (AIC). The Maximum Likelihood (ML) method is adopted because it allows inferences to be made on the covariance parameters of the model. The Hausman test is used to evaluate the consistency of the random effects in comparison with the fixed effects.

The author’s intention is to determine whether there is a quantitative relation between the dependent and independent variables, based on the following two models:
ΔEMPL_{ti} = γ00 + γ10ΔIFDI_{lt} + γ20ΔIFDI_{lag1t} + γ30ΔIFDI_{lag2t} + γ40ΔIFDI_{lag3t} + γ50DEV_ST_{lt} + μ1iΔIFDI_{lti} + \mu2iΔIFDI_{lag1ti} + \mu3iΔIFDI_{lag2ti} + \mu4iΔIFDI_{lag3ti} + \mu0i + \epsilon_{ti} \tag{1} \\
ΔANW_{ti} = γ00 + γ10ΔIFDI_{lt} + γ20ΔIFDI_{lag1t} + γ30ΔIFDI_{lag2t} + γ40ΔIFDI_{lag3t} + γ50DEV_ST_{lt} + μ1iΔIFDI_{lti} + \mu2iΔIFDI_{lag1ti} + \mu3iΔIFDI_{lag2ti} + \mu4iΔIFDI_{lag3ti} + \mu0i + \epsilon_{ti} \tag{2}

where:
- γ00 – grand intercept capturing the variation amongst t in i,
- γn0 – fixed effects across groups,
- μ0i – between-country variation in intercepts – deviation from the average intercept,
- \mu ni – random effects capturing variation in individual slope coefficients,
- ε_{ti} – individual-level residual in t within i.

The model estimations are expressed in the annual growth rate. The dependent variable is: ΔEMPL in model (1), and ΔANW in model (2). The independent variables are: ΔIFDI with its time lags (ΔIFDI_{lag1}, ΔIFDI_{lag2}, ΔIFDI_{lag3}) and DEV_ST for the six countries.

The hypothesis H0 is that changes in both ΔEMPL and ΔANW are not influenced by changes in ΔIFDI and its time lags and DEV_ST, while hypothesis H1 is that changes in both ΔEMPL and ΔANW are influenced by changes in ΔIFDI and its time lags and DEV_ST.

In the next section, model 1 is shown as (1), and model 2 as (2).

EMPIRICAL RESULTS

The estimation is by LMM, or between-groups and within-group estimation. Random effects, therefore, consider idiosyncratic qualifications of the units as non-observable and randomly distributed.

Table 3 - Modelling of employment percentage rate changes

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>Std. Error</th>
<th>df</th>
<th>t</th>
<th>Sig.</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.005357</td>
<td>0.001773</td>
<td>21.279</td>
<td>-3.021</td>
<td>.006</td>
<td>-0.009041</td>
<td>-0.001672</td>
</tr>
<tr>
<td>[dev_st=0]</td>
<td>0.021609</td>
<td>0.001925</td>
<td>14.786</td>
<td>11.225</td>
<td>.000</td>
<td>0.017501</td>
<td>0.025718</td>
</tr>
<tr>
<td>[dev_st=1]</td>
<td>0b</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ΔIFDI</td>
<td>0.000867</td>
<td>0.003700</td>
<td>19.766</td>
<td>.234</td>
<td>.817</td>
<td>-0.006856</td>
<td>0.008591</td>
</tr>
<tr>
<td>ΔIFDI_{lag1}</td>
<td>-0.001613</td>
<td>0.001916</td>
<td>24.429</td>
<td>-.842</td>
<td>.408</td>
<td>-0.005563</td>
<td>0.002337</td>
</tr>
<tr>
<td>ΔIFDI_{lag2}</td>
<td>0.015300</td>
<td>0.005566</td>
<td>5.986</td>
<td>2.749</td>
<td>.033</td>
<td>0.001673</td>
<td>0.028927</td>
</tr>
<tr>
<td>ΔIFDI_{lag3}</td>
<td>0.025344</td>
<td>0.005284</td>
<td>7.004</td>
<td>4.796</td>
<td>.002</td>
<td>0.012850</td>
<td>0.037838</td>
</tr>
</tbody>
</table>

a. Dependent Variable: ΔEMPL.

b. This parameter is set to zero because it is redundant.

Source: Author’s calculation
Table 3 shows 0.015% and 0.025% increases in ∆EMPL for each additional unit of change in ∆IFDI after two (∆IFDI_lag2) and after three (∆IFDI_lag3) years of its performance, respectively, these are statistically significant for both developed and transitional countries. The strongest positive effect is represented by the ∆IFDI_lag3, so for the double increase in IFDI in time t there would be a 0.025% (p=.002) increase in ∆EMPL after 3 years of foreign investment performance in the country i. The model suggests that the DEV_ST has positive effects on the growth in ∆EMPL in transitional countries and it is statistically significant. The greater the foreign investment, the faster the growth in EMPL in transitional countries compared with developed countries, which is in accordance with the theoretical and empirical assumptions that in developed countries there is a lower increase in employment (because of the saturated labour market), while in transitional and developing countries there is more room for faster employment growth (because of the unsaturated labour market). As for model (1), each unit of increase in foreign investments in time t increases the average employment growth rate in the countries in transition by 0.02% (p=.000) per year.

Table 4 - Modelling of average net wages percentage rate changes

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>Std. Error</th>
<th>df</th>
<th>t</th>
<th>Sig.</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>.010167</td>
<td>.003279</td>
<td>10.267</td>
<td>3.101</td>
<td>.011</td>
<td>.002887</td>
<td>.017446</td>
</tr>
<tr>
<td>[dev_st=0]</td>
<td>.004574</td>
<td>.003845</td>
<td>18.774</td>
<td>1.190</td>
<td>.249</td>
<td>-.003480</td>
<td>.012627</td>
</tr>
<tr>
<td>[dev_st=1]</td>
<td>0b</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆IFDI</td>
<td>.011896</td>
<td>.009812</td>
<td>6.113</td>
<td>1.212</td>
<td>.270</td>
<td>-.012006</td>
<td>.035797</td>
</tr>
<tr>
<td>∆IFDI_lag1</td>
<td>.002940</td>
<td>.002064</td>
<td>4.915</td>
<td>1.424</td>
<td>.215</td>
<td>-.002393</td>
<td>.008273</td>
</tr>
<tr>
<td>∆IFDI_lag2</td>
<td>.000675</td>
<td>.001147</td>
<td>7.751</td>
<td>.589</td>
<td>.573</td>
<td>-.001985</td>
<td>.003336</td>
</tr>
<tr>
<td>∆IFDI_lag3</td>
<td>.002015</td>
<td>.000692</td>
<td>3.832</td>
<td>2.913</td>
<td>.046</td>
<td>6.079346E-05</td>
<td>.003969</td>
</tr>
</tbody>
</table>

a. Dependent Variable: ∆ANW.
b. This parameter is set to zero because it is redundant.

Source: Author’s calculation

Table 4 represents an increase in ∆ANW due to ∆IFDI_lag3 in the observed period. In the countries in transition the amount is a 0.0046% increase, while in developed countries the increase in ∆ANW due to the changes in ∆IFDI is almost null. This means that there is 0.0046% greater growth rate in ∆ANW in the countries in transition, which justifies the logic explained in the previous model. The impact of the changes in ∆IFDI on ∆ANW is positive and statistically significant after three years of its performance. The model suggests that the greater the foreign investment, the faster the growth in ANW. If foreign investments double in time t in country i, after three years the average growth rate of ∆ANW will be 0.002% (p=.046).

Both models include the developmental stage effects. The findings suggest that the effect of DEV_ST of the countries is positive and statistically significant (p=.000) for the ∆EMPL. In both cases, there is a positive growth rate in all the countries, meaning that H0 is rejected.

DISCUSSION AND CONCLUSION

This research empirically estimated the impact of the changes in FDI inflow on the changes in the employment rate and in average net wages in the ex-Yugoslav countries, using linear mixed-effects models. The analysis shows the existence of a positive but still very low impact of FDI inflow on both the employment rate and average net wages, mainly after 3 years of FDI inflow performance. The analysis shows the developmental stage of the country matters for positive changes in the employment rate but not for changes in average net wages.

FDI inflow showed a positive, even if very low, impact on the examined labour market indicators. Perhaps the four transition countries should look at Slovenia’s economic strategies as well as thoroughly investigating the FDI inflow options before adopting it. Moreover, regional collaboration should be strengthened in order to stimulate foreign companies to invest and to communicate with the region. Finally, it is recommended to study how to attract investors that pay higher wages, which involves studying also the availability and skills of host country employees and any potential brain drain. Lastly, it is recommended to enhance the efficiency and competitiveness of the national economy along with the companies through the implementation of strategies in order to solve employment and wage problems.

The findings of this research, as regarding average net wages average net wages, are consistent with Bhandari (2007) and Kurtovic et al. (2015), authors who applied OLS regression estimation instead of linear mixed models.
As for the impact of FDI inflow on employment, Jude & Silaghi (2016) would provide an effective comparison with this research if the authors had used FDI inflow instead of FDI stock, because both analyses claim the positive long-term effect on employment. The findings of this paper partially confirm the findings of Pajović (2007) as well, while disagreeing with e.g. Perić (2019), presumably because of the larger sample used in this research.

The limitations of the research and recommendations are as follows. Since there is little empirical evidence of the impact of FDI inflow on labour market indicators in transition countries, this paper offers findings to stimulate further research. In the first place, it is recommended that more countries should be included in the model. In order to estimate the impact of FDI inflow in each individual country, one could conduct single regressions to estimate the supposed impact of FDI inflow on the employment rate and on average net wages. That would serve to confirm or deny the hypothesis that for one country the effect of FDI inflow comes sooner because it is invested in the service sector, but in some others that are invested in industry or the production sector it comes later. The distinction is because there is reason to believe that the effect of FDI inflow is not equal for all six countries.

AKNOWLEDGEMENTS

I would like to express my deep gratitude to Professor Ne-manja Stanišić for his helpful suggestions for this research.

REFERENCES


