FDI and The Unemployment - A Causality Analysis for The Latest EU Members

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Abstract

FDI have been regarded in the last years, by the developing countries, as one of the best alternatives to fuel their economic growth. The macroeconomic stability and the labor market of an economy have been identified by the literature, as some of the main aspects that are analyzed by foreign investors before deciding for a future host country. The reverse impact is also mentioned by the researchers who provide strong evidence supporting the hypothesis that FDI bring important benefits to a host country. Consequently, studying the interdependencies between the inflow of FDI and the unemployment becomes of high importance for each country which shows increased interest in attracting foreign direct investments. The present analysis is conducted for the period 1991 – 2012, on yearly data (for the latest thirteen member states of the EU) downloaded from the web page of the World Bank. The econometrical methodology is based on the T-Y procedure which was used with the purpose of analyzing the short term causal relationship between the two variables. The main finding of the study is that there is no Granger causality relation between the variables for six countries and a one direction causal relation was identified for the remaining ones.

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1. Introduction

Foreign direct investments have been regarded in the last years by the governments of the developing countries as one of the best alternatives to fuel their economic growth. In these circumstances, identifying the main characteristics of a state that are important for foreign investors and also analyzing the influence of the foreign direct investments on the characteristics of an economy, has become of significant interest for the policymakers, the economists and also for the academic environment.

Moreover, the foreign direct investments have been regarded by the authorities from the ex communist countries as being an important source for management skills, for new and better paid jobs and for products and services of an improved quality which could increase both the internal market and also the export potential of their economy.

Among the determinants of the foreign direct investments identified by the literature, the macroeconomic stability is becoming, together with corruption, political stability and quality of legislation, more and more important in the nowadays conditions. Therefore studying such a linkage, between the inflows of foreign direct investments and the macroeconomic stability of a country, is of an increased importance today. The literature presents two main variables used as proxies for the macroeconomic stability, namely: the inflation rate and the employment/unemployment rate. Consequently, in the present study we have decided to use the unemployment rate as a proxy for the macroeconomic stability of an economy.

The sample of countries included in the analysis consists of the latest thirteen member states of the European Union and the analyzed time period spans from 1991 until 2012.

The paper will be further organized in four main sections: literature review and theoretical background, methodology and data related issues, empirical results and finally conclusion.

2. Literature review and theoretical background

The interdependencies between the FDI and the labour market related aspects are an important topic in the literature concerned with the study of the FDI. There are also a significant amount of studies which examine the interdependencies between the macroeconomic stability of a country and the inflow of foreign direct investments received by that respective country. In an important part of these studies (Botric and Skuflic, 2006), the employment or the unemployment is used as a proxy for the macroeconomic stability (sometimes it is also used as a proxy for labour market related aspects) of a country. Even though most of the studies published in this domain report that foreign direct investment decrease the unemployment rate, the obtained results have not yet fully clarified the linkages between these two phenomena. However, it is clear that the interdependencies among foreign direct investment and the employment or the unemployment rate vary significantly from country to country (depending on the structure of the economy and also on the type of received foreign direct investments) and also from period to period (the structure of an economy can change significantly over a long period of time and also the typology of the received foreign direct investment can change significantly over longer periods of time). Also, noteworthy is the fact that there is a significant amount of studies who report no causal relation among these two phenomena.

An important number of specialists argue that countries with higher unemployment rates have two major advantages in the eyes of foreign investors: a) plenty of available labour force; b) high probability of finding available work force at lower wages (Blanchard 2011). However, we are aware of other theories who suggest that, too high unemployment rate recorded in a country is perceived by foreign investors as a signal of macro economical disequilibrium and, therefore, the country is not seen as an appropriate host country for a future investment (Brozen 1958).

Summarizing these approaches we will construct our research using two main hypotheses, which will be listed further.

- **Hypothesis 1**: The inflow of FDI influences the unemployment rate in a country.
- **Hypothesis 2**: The unemployment rate has an influence on the inflow of FDI attracted by a country.

The literature also brings evidence sustaining the theory according to which the Greenfield investments have significantly higher positive effects on the employment rate than the Brownfield ones (these Brownfield investments can have no effect or even negative effects). Evidences in this direction are brought by Hisarciklilar et al in a study...
performed for the Turkish economy, published in 2009. In another research paper, Bakkalci and Argin (2013) show that there is a direct influence of the inward foreign direct investments on the employment. Their study investigated the relations between these phenomena for the Turkish economy for a set of quarterly data ranging from 2000 until 2011. Another study, conducted by Aktar and Öztürk in 2009, reported the existence of no causal relationships between the unemployment and the inflow of foreign direct investment, for the Turkish economy. The same conclusion was also reached by Saray in 2011 when he analyzed data stretching from 1970 until 2009, again regarding the Turkish economy.

A positive effect of the foreign direct investments on the employment growth was also reported by Karlsson et al in a research paper published in 2009 where they have used a sample of manufacturing companies from China for the period between 1998 and 2004. The same positive effect of the inflow of foreign direct investments on the employment rate is reported by Craigwell in a study published in 2006. He reports these findings for 20 Caribbean countries for the period 1990 – 2000.

Ajaga and Nunnekamp (2009) reported also, in a more complex study, conducted for the USA, the positive effects of the inward foreign direct investments on the employment level (their study reported long run effects). Jayaraman and Singh showed a unidirectional long run causality relation from the foreign direct investment towards employment, in a study released in 2007. Their findings were reported for the economy of Fiji.

Important evidence in this direction obtained also Lipsey et al in a study published in 2010. In their study, they conducted a research on a large sample of Indonesian plants for the period 1975 – 2005. For these companies they have examined the employment growth and they have observed that the shifting of ownership from local to foreign had a significant effect in growing the employment.

A causal short run relationship running from the foreign direct investments towards employment was also identified by Yayli and Deger (2012) in a study, where dynamic panel causality tests were employed. In the same direction point the findings of Adam P. et al (2011). Their study was performed on the Polish economy for the period of 1995 and 2009, using a VAR approach. On the other hand, a long run relationship between foreign direct investments and employment, in a research conducted for Pakistan, was identified by Habib and Sarwar in a study published in 2013.

Rizvi and Nishat argue, in a study published in 2009, that the foreign direct investments do not have a direct impact on the unemployment for the studied countries (China, India and Pakistan for the time period 1985 - 2008).

Summarizing this section, we can state that the interdependencies between the foreign direct investments and the employment/unemployment rate are not fully clarified although there are some strong evidences showing that the foreign direct investments impact positively the employment rate. However, we should bear in mind the fact that these linkages depend heavily on the studied country (group of countries), the studied type of foreign direct investments and also on the analyzed time periods.

3. Research goal, methodology and data

3.1. Research goal and study limitations

The main goal of this paper is to analyze the short run causal relations between the inflows of foreign direct investments (net inflows) and the unemployment rate for the latest thirteen member states of the European Union. The findings of this paper might be of interest for the policy makers when reshaping their existing policies or when designing new policies with the purpose of attracting new capital in their economies under the form of foreign direct investments. In another fashion, the results of this study can be used when assessing the results and the benefits (brought to the local economy by foreign direct investments) of the existing policies in this particular field.

Before going further, with explaining the methodology and the data set used in this research paper, we need to state clear that we are aware of the limitations of the present study. One of the most important is represented by the short available time series. Although, we believe that this weakness is somehow common to a large variety of studies concerned with the analysis of foreign direct investments received by the ex communist countries from the eastern part of Europe. We are also aware, that, for some of the studied countries, the period between 1990 and 2000 was characterized by some important macroeconomic disequilibria and instability. Even though this shortcoming, resulted from the use of short time series, could have been removed by using quarterly data this approach was not feasible due to the fact that this type of data were not available. Therefore we believe that the results presented in this research paper should be regarded with great caution and they should be treated more as
starting points for more elaborate future research. Thus, these results should be further validated at the level of each country through different methods and maybe with the help of quarterly data.

3.2. Methodology

The methodological approach proposed in this paper is based on the Toda Yamamoto procedure, which allows only for testing the short run causality relation. The main advantage of this procedure is that it can be applied in level VARs for stationary, integrated or even co integrated variables. The Toda-Yamamoto procedure requires to estimate an augmented VAR \((k + d_{\text{max}})\) model, where \(k\) represents the optimal lag length in the original VAR system and \(d_{\text{max}}\) represents the maximal order of integration of the studied variables (those included in the same system). The method consists in a two stage approach which needs to be performed in order to identify the existence of the Granger causality from the first variable towards the second and also vice versa. In the first stage, the maximum integration order \((d_{\text{max}})\) is identified after analysing the stationarity of all the involved variables. In this first stage, we also need to identify the optimum lag order \((k)\) which is performed with the help of the following criteria: SC, AIC, FPE, LR and HQ.

In the second stage, the MWald test is used in order to test the VAR \((p)\) model for causality. The lag order \((p)\) is obtained by adding the optimal lag \((k)\), and the maximum integration order \((d_{\text{max}})\), which were both identified in the first stage. The Wald test is afterwards applied only to the first \((k)\) coefficients of the augmented VAR model.

The two directions of potential causality relations involve the following null hypotheses:

- **Hypothesis 1**: The \(X\) variable does not granger cause \(Y\) variable.
- **Hypothesis 2**: The \(Y\) variable does not granger cause \(X\) variable.

3.3. Data issues

The set of data which is used in the study covers the period from 1991 – until 2012 for six of the thirteen analyzed countries: Cyprus, Malta, Hungary, Poland, Bulgaria and Romania. For other three countries, namely: Slovenia, Croatia and Latvia, the used data were available starting from 1992, and finally, for the last four countries: the Czech Republic, Estonia, Lithuania and Slovakia the available time series stretch from 1993 until 2013.

For all thirteen states, the time series (the unemployment rate and the net inflow of foreign direct investment) were downloaded from the web site of the World Bank. Due to comparability reasons the net inflows FDI are presented as percentage from the GDP of the country. By doing so, we do not need to pay special attention to the size difference between these thirteen economies.
As it is observable from the chart listed in the Figure no. 1 the foreign direct investments expressed as % from the GDP started to increase their magnitude for all the analyzed countries from the beginning of the ‘90 until 2002, 2003. Notable are the peaks registered for some countries during the period 2005 – 2008, and also the abrupt decrease registered between 2008 and 2010.

The unemployment rates vary heavily for the analyzed sample of countries. During the years 2001 and 2002 the rate varied between values over 20% registered for Croatia and values around 4% for Cyprus. During the period 2006 – 2007 the unemployment rate registered very low values for all countries. Being probably, heavily influenced by the economical crisis the unemployment increased sharply during the years 2009 – 2010.
4. Empirical results

Following closely the steps of the econometrical procedure described in the methodology section, we started our analysis by testing if the involved variables are stationary. In order to conduct such an analysis, the Augmented Dickey Fuller test was employed. For each country the test was performed initially for the variables in level. Going further, for all those variables which were identified as having a non-stationary evolution, the test was applied again for the 1st Difference. The obtained results are visible in Table no. 1. In the table we have listed the values obtained for the ADF test for each variable, both when performed in level and in the 1st Difference.

Table 1- The values of the Dickey-Fuller test for the used variables (level and 1st difference)

| Unit root test | Augmented Dickey-Fuller |
|----------------|-------------------------|
|                | Country | Level  | 1st Difference | 2nd Difference |
|                | FDI     | -1.67  | -10.06***      |
|                | Unemp.  | -2.97* | -9.38***       |
|                | Hungary | -2.73* | -5.97***       |
|                | Unemp.  | -1.15  | -3.73***       |
|                | Malta*  | -3.94*** | -6.78***      |
|                | Unemp.  | -3.16** | -6.47***      |
|                | Poland* | -2.67* | -5.01***       |
|                | Unemp.  | -3.05** | -2.76***      |
|                | Bulgaria| -3.63* | -3.64***       |
|                | Unemp.  | -2.69  | -4.54***       |
|                | Romania | -1.01  | -5.48***       |
|                | Unemp.  | -3.44** | -4.99***      |
|                | Slovenia| -3.62** | -5.52***      |
|                | Unemp.  | -2.37  | -6.29***       |
|                | Croatia | -2.11  | -4.54***       |
|                | Unemp.  | 0.24   | 3.25***        |
|                | Latvia  | -3.56** | -4.11***      |
|                | Unemp.  | -2.47  | -3.55***       |
|                | Cz Rep. | -2.76* | -5.86***       |
|                | Unemp.  | -2.59  | -3.66***       |
|                | Estonia*| -3.06** | -7.76***      |
|                | Unemp.  | -3.64** | -4.25***      |
|                | Lithuania* | -2.76* | -4.72***    |
|                | Unemp.  | -3.02* | -3.47***       |
|                | Slovakia | -2.58  | -5.72***       |
|                | Unemp.  | -2.30  | -2.65**        |

Having the integration order established for all the variables, we went further to establish the (dmax) order for each of the employed thirteen VAR models. The (dmax) was selected for each model, as the maximum integration order for the two involved variables. For nine of the model the chosen (dmax) was 1 (Cyprus, Hungary, Bulgaria, Romania, Slovenia, Croatia, Latvia, the Czech Republic and Slovakia) and for the remaining four the value of (dmax) was 0 due to the fact that both variables used in the model were found to be stationary.
After having the \((d_{\text{max}})\) value for the VAR models established we went further with the procedure in order to identify the optimum lag order. For this purpose all the five available lag length criteria (LR, FPE, AIC, SC and HQ) were used. The lag identified with the help of each criterion for all thirteen models are listed in the Table no. 2.

For each model we have decided to use as optimal \((k)\) lag the lag identified by most of the employed criteria. Due to comparability reasons, for Malta we have used a model with 1 lag, despite the results provided by the five criteria. Important to mention, at this moment, is the fact that the residuals of the models passed the serial correlation test. For this purpose (the residuals not to be affected by serial correlation phenomenon) we have decided to use a lag equal with 2 in the case of the model designed for Romania. For none of the models the lag was not extended further due to the usage of the short time series.

Table 2 - The optimal lag selection criteria

| Country  | VAR Model        | LR | FPE | AIC | SC | HQ |
|----------|------------------|----|-----|-----|----|----|
| Cyprus   | FDI & Unemp      | 2  | 2   | 2*  | 0  | 2  |
| Hungary  | FDI & Unemp      | 1  | 2   | 2*  | 1  | 2  |
| Malta*   | FDI & Unemp      | 0  | 0   | 0   | 0  | 0  |
| Poland   | FDI & Unemp      | 2  | 2   | 2*  | 2  | 2  |
| Bulgaria | FDI & Unemp      | 1  | 2   | 2*  | 2  | 2  |
| Romania* | FDI & Unemp      | 1  | 1   | 1   | 1  | 1  |
| Slovenia | FDI & Unemp      | 1  | 2   | 2*  | 1  | 2  |
| Croatia  | FDI & Unemp      | 1  | 1   | 1*  | 1  | 1  |
| Latvia   | FDI & Unemp      | 1  | 2   | 2*  | 1  | 2  |
| Cz Rep.  | FDI & Unemp      | 1  | 1   | 1*  | 1  | 1  |
| Estonia  | FDI & Unemp      | 0  | 2   | 2*  | 0  | 2  |
| Lithuania| FDI & Unemp      | 1  | 2*  | 3   | 2  | 3  |
| Slovakia | FDI & Unemp      | 1  | 2   | 2*  | 1  | 2  |

Further we have estimated the augmented VAR models for each country. The lag order \((p)\) for each VAR model was calculated by simply adding the maximum integration order \((d_{\text{max}})\) with the optimum lag \((k)\).

The obtained results are listed in the Table no. 3. For each model where we have identified the existence of a potential causality relation running from the foreign direct investments towards the unemployment or in the reverse direction we have marked it with Yes in the table. We have also listed, in the table, the significance level for which we have rejected the null hypothesis.

Table 3 - The Granger causality relations

| Country  | VAR Model        | \(A \rightarrow B\) | \(B \rightarrow A\) | Sig. level |
|----------|------------------|---------------------|---------------------|------------|
| Cyprus   | FDI & Unemp      | No                  | No                  |            |
| Hungary  | FDI & Unemp      | Yes                 | No                  | 1%         |
| Malta    | FDI & Unemp      | Yes                 | No                  | 5%         |
| Poland   | FDI & Unemp      | No                  | No                  |            |
| Bulgaria | FDI & Unemp      | Yes                 | No                  | 10.04%     |
| Romania  | FDI & Unemp      | No                  | Yes                 | 1%         |
| Slovenia | FDI & Unemp      | No                  | No                  |            |
The null hypothesis was rejected for seven of the thirteen analyzed VAR models. In order to be more precise, we mention that the null hypothesis stating that there is no granger causality running from the foreign direct investments towards unemployment was rejected for four models and the null hypothesis stating the reverse causal link was rejected for three models. By consequence, for six of the analyzed models no causality relationship was identified between the studied variables.

Therefore, for four countries, namely: Hungary, Malta, Bulgaria and Estonia we might state that the inflow of foreign direct investments has a significant impact on the unemployment rate.

On the contrary, for the cases of Romania, Slovakia and the Czech Republic the unemployment rate is proved to have a causal influence on the inflow of foreign direct investments. The relation between the two phenomena is positive for all the three analyzed models. Therefore higher unemployment will cause higher inflow of foreign direct investments. This finding is in line with the theory which states that foreign direct investments are attracted in countries where they observe the existence of available work force.

5. Conclusions

Concluding, we can say that the present research paper could be included among those works that focus on studying the relationship between the inflow of FDI and the macroeconomic stability of a country proxyed through the unemployment rate. Also of significant importance is the fact that all the latest thirteen EU member states are included in the study presented in the paper.

However, before describing the main findings of the paper and also some policy implications we will provide again a short description of the main limitations implied by this study. The most important of them is represented by the usage of short time series (also the time series do not cover the same period for all the studied countries). Although, we believe that this weakness is somehow common to a large variety of studies concerned with the study of foreign direct investments received by the ex communist countries from the eastern part of Europe. We are also aware that, for some of the studied countries, the period between 1990 and 2000 was characterized by some important macroeconomic disequilibria and instability. Even though this shortcoming resulted from the use of short time series could have been removed by using quarterly data this approach was not feasible due to the fact that this type of data were not available. Therefore, we believe that the results displayed in this research paper should be regarded with great caution and they should be treated more as starting points for more elaborate future research. Thus, these results should be further validated at the level of each country through different methods and maybe with the help of quarterly data.

The first important finding of the paper consists in the fact that there is a causality relation running from the inflow of foreign direct investments towards the unemployment for four of the thirteen studied countries, namely for: Hungary, Malta, Bulgaria and Estonia. Therefore the governments of these countries should bear in mind all aspects related to the FDI domain when they intend to design policies with the purpose of reducing the unemployment.

The second finding of the study is represented by the identification of the causality relation which runs from the unemployment towards the inflows of foreign direct investments for the case of Romania, the Czech Republic and Slovakia. Higher unemployment causes higher inflows of foreign direct investments proving therefore that foreign investors search locations where the availability of the work force will not be a problem. Therefore the governments of these countries should concentrate their efforts in designing policies for attracting the foreign investors due to the fact that their countries have an important potential in this domain. However, this finding needs to be regarded with caution due to the fact that the relation might change if the unemployment increases too much because foreign investors will not be interested in locating a future investment or developing an existing one in a country where there are (important) signs of macroeconomic instability.

| Hrvatska | FDI & Unemp | No | No |
|----------|-------------|----|----|
| Latvia   | FDI & Unemp | No | No |
| Cz Rep.  | FDI & Unemp | No | Yes 5% |
| Estonia  | FDI & Unemp | Yes | No 10% |
| Lithuania| FDI & Unemp | No | No |
| Slovakia | FDI & Unemp | No | Yes 5% |
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