

## **RELATIONSHIP BETWEEN EUROZONE MEMBERSHIP AND FOREIGN DIRECT INVESTMENTS**

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### **Abstract**

With the creation of the euro area and the use of the euro as a common currency, member countries enabled companies that originated in one of the member countries, to sell their products more easily and thus stimulate foreign direct investments. The monetary and economic union of the euro area has made easier for enterprises to penetrate the markets of member countries by reducing their fixed costs. Firms instead of keeping one account for each of their economic activities in each state, for example with 11 different currencies, trying to hedge against unforeseen exchange rate fluctuations and its effect on sales, now overall, they can deal with only one account. Foreign direct investments, especially vertical investment, have enabled enterprises to produce their products in countries that have had the most favorable costs for them. Because this has stimulated trade and trade had also been stimulated by the effect of the adoption of the euro as a common currency, it is expected that the common currency in turn will stimulate foreign direct investments, even more. Evidence for this effect will be provided below, citing various studies that will verify the positive impact of the euro area on stimulating foreign direct investments in member countries. In this paper, an estimation of the determinants of foreign direct investment will be given through various methods. The methods that will be used, are the panel data, fixed effects, and random effects method. The data that will be used to make the analysis will be obtained from the Republic of North Macedonia and from countries that are its main partners and that are members of the European Union and the Euro area.

*Keywords:* Investment, Euro zone, Membership, Growth.

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### **1. Introduction**

A significant influence, for a country, to become part of an economic and monetary union or not, is that membership in a monetary area will help a country to achieve a higher economic prosperity. The degree of prosperity of a country is closely related to its openness to investments, i.e., foreign investments, which are a stimulus for economies and consequently affect the improvement of the welfare of the population. This paper will address the correlation between the common currency, the euro, and the inflow of foreign investments. The main goal will be to identify the ways in which membership in a monetary union and the common currency will strengthen the level, of existing investment and the inflow of foreign investment, for member countries as well as for countries wishing to join a monetary area.

### **2. Literature review**

In contemporary literature, investments are considered as important stimulus factors for economic development, therefore it is very important to identify the factors that will make a

country attractive to foreign direct investments. It will be very interesting to analyze the impact of the euro as a common currency on the movement of capital, which then influences the decisions of international enterprises to invest in a certain market. Another important factor that affects the inflow of foreign investment is the uncertainty that international firms may feel, especially the type of uncertainty that has to do with exchange rate volatility. Coverage from this type of eventual risk increases the importance of the membership in a monetary union, which has as a consequence the elimination of the exchange rate volatility risk, which in turn affects positively the level of foreign direct investment.

Gebauer, Setzer, and Westphal (2017) investigated the relationship between corporate debt and investment, for five peripheral euro area countries by using firm-level data from 2005-2014. They concluded that leverage has a negative and significant impact on investment. According to the study, low levels of debt can also have a negative influence on investment for smaller firms. The authors concluded that in peripheral countries there are many small firms with low productivity and high financial uncertainty, all these factors contribute to reducing the capacity to tolerate high levels of debt and can lead to a decrease in investments.

García-Posada (2018), using a panel of small and medium-sized enterprises from 12 European countries for the period 2014-2016, analyzed the impact that various credit constraints have on investment, inventories, and firm growth. They implemented several strategies for investment opportunities, lagged regressors, random effects, and instrumental variables. The authors concluded that credit constraints have strong negative effects on investment in fixed assets, while the impact on firm growth and working capital is less robust.

The common currency of an economic and monetary area, such as the euro area, according to various studies has been concluded to have a positive effect on investment. Sousa and Lochard (2006) highlighted the channels through which investments are influenced. Firstly, the economic and monetary integration affects investments through reducing transaction costs, and secondly by reducing the risk of macroeconomic instability. The authors studying the impact of monetary integration on bilateral investments concluded that the economic and monetary integration of the euro area affected stimulating the investment level within member states, i.e., the level of domestic investment increased by 30 percent in the first four years, but not only that, but the authors also concluded that the impact of the euro was the greatest in peripheral member states, either geographically or economically. Such a conclusion by the authors may encourage countries that are not yet members of the European Union and the euro area to work in this direction to attract greater inflows of foreign direct investments

In contrast to Sousa and Lochard, in a study on the impact of monetary areas, with particular emphasis on the euro area, on attracting foreign investment, Aristotelous and Fountas (2012) using different econometric methodologies in data analysis of 22 OECD countries, for the period 1973-2006, concluded that countries that adopted the common currency had significant growth in foreign investments. They estimated that the annual growth was from 11.9 to 22.9 percent for the period 1990-1998. According to the authors, the distribution of foreign investments in the euro area is asymmetric. Namely, the countries that are at the center of the monetary and economic union had a positive and significant impact on investments attraction, while the ones that were on its periphery had a less pronounced impact on foreign investments.

Other authors such as Pantelis, Kyrkilis, and Nikolopoulos (2014) attempted to test different models that would explain the levels of foreign direct investments of member states of an economic and monetary area, such as the euro area for the period 1985-2011. Analyzing the various determinants that affected the investments, they concluded that the euro area did not have any

significant impact on attracting investments for individual countries and that they would have had more investments if they would try to attract them through more conventional methods, like that of trade. As a reason why the impact of the euro was insignificant, the authors pointed out that the high level of integration of the member states' economies as well as the reduction of trade barriers had influenced the euro to have a marginal impact.

Wei and Choi (2002), analyzing how countries join together to use a single currency and the impact on cross-border investment between countries, used data of the bilateral investments of 16 countries of origin and 57 countries of acceptance of these investments and concluded that a reduction in exchange rate volatility has a positive effect on the volume of foreign investments. The authors used dollarization for their study, which means countries that use the dollar as a means of payment. According to their estimates, countries that were a member of the dollarization group had 185 percent more investments from the United States than countries that had the same characteristics but were not a member of this group of countries. The authors pointed out that in addition to dollarization, several other factors provided an investment incentive such as distance, language, level of corruption, etc. However, according to their study, it was clear that there is a strong link between the amount of foreign investment in the country and the exchange rate volatility.

Concerning Western European transition economies, Bevan, Alan, and Estrin, (2004), using the bilateral investment data panel method, attempted to study what were the main factors influencing the inflow of foreign investments from the western countries of Europe to eastern ones. The authors concluded that for the host countries of foreign investments the factors that have a major impact are labor costs, size, and proximity to the market. According to their results, an important factor that had a positive influence was the various announcements related to the membership of a country in the European Union.

### 3. Methods

Since the establishment of the European Monetary Union, numerous analyzes and studies have been made regarding the impact of the uncertainty, brought about by exchange rate volatility, in attracting foreign investments, as well as does the adoption of the euro as a common currency by all members of the European Union will have a positive impact. In this part of the paper, it will be developed a model for the analysis of the determinants that affect the level of foreign direct investment and the role that can play the membership in a monetary union such as that of the euro area. The model used will be based on the econometric model of Aristotelous and Fountas (2012), who used several determinants to define the level of investments in each country. The level of foreign direct investments from one country  $i$  to another country  $j$  at time  $t$  will be expressed as follows:

$$(FDI_{it}) = \beta_0 + \beta_1(GDP_{it}) + \beta_2(Exchange\ rate_{it}) + \beta_3Dist_{ij} + \beta_4GDP\ growth_{it} + \beta_5EU + \beta_6EMU_{ijt} + \varepsilon_{ijt}$$

Where  $FDI_{it}$  indicates the foreign direct investment of the host country  $i$ ,  $Dist_{ij}$  indicates the geographical distance, in kilometers, between the capital of the countries and the city of Frankfurt, also considered the industrial capital of European Union,  $GDP_{it}$  represents the gross domestic product of the host country of the investments at time  $t$ ,  $Exchange\ rate_{it}$  shows the ratio of the local currency exchange rate to that of its trading partners,  $EU$  is a binary variable, it shows that

the country which is the host of foreign investments at time  $t$  has become a member of the European Union and gets the value 1, while 0 otherwise.  $EMU_{ijt}$  is also a binary variable which indicates that the host country of foreign investment at time  $t$  has become a member of the euro area and takes the value 1, while 0 otherwise.

The data that will be used to make the analysis will be obtained from the Republic of North Macedonia and from countries that are its main partners and that are members of the European Union and the Euro area.

Multiple methods will be used, that of panel data, fixed effects, and random effects method. The period for which the data will be analyzed is from 1995 to 2015 and more countries will be considered to have a more accurate picture of the effect of the common currency euro on the ability of a certain country to attract foreign investments. The countries that will be considered in the analysis are those that have approximately same level of per capita income as the Republic of Northern Macedonia and which are members of the European Union or the Eurozone.

#### 4. Results

Table 1. Estimation results			
Variables	Investments	Panel Investments effects	Fixed Investments Random
<i>GDP</i>	0.010* (0.005)	0.043*** (0.013)	0.028*** (0.010)
<i>GDP growth</i>	1.589e+09* (8.168e+08)	1.626e+09** (7.177e+08)	1.571e+09** (7.139e+08)
<i>Exchange rate</i>	-1.173e+07 (17598842.826)	18272104.281 (16989581.993)	11012496.347 (16507285.742)
<i>Distance</i>	-2.361e+07*** (5367277.861)	-	-1.775e+07 (15327136.876)
<i>Eu</i>	2.496e+09 (9.752e+09)	-2.846e+09 (8.712e+09)	-3.372e+09 (8.631e+09)
<i>Emu</i>	2.432e+10*** (8.163e+09)	1.825e+10** (7.676e+09)	1.975e+10*** (7.567e+09)
Constant	2.536e+10** (1.139e+10)	-1.002e+10 (9.958e+09)	1.750e+10 (2.301e+10)
Observations	345	345	345
R-squared	0.157	0.066	
Number of state code		17	17

Standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

In the table 1 above are presented the results obtained from the regression equation, they are realized using three different methods. In the first column, where the regression results are

presented according to the panel data method the GDP is an independent variable that positively affects the level of foreign direct investment, it is also significant at the level of 10 percent. GDP growth, which represents the annual increase, in percentage, of the gross domestic product of countries that are part of the euro area, also shows a positive correlation with the level of the foreign direct investment inflow in the respective country and is significant at the level of 10 percent. The Exchange rate, which represents the value of the local currency, shows a negative correlation with investments, this means that an increase in the exchange rate will result in a decrease in foreign investment in the euro area countries, however, its role is not considered as important as its effect is not significant at the level of 1, 5 or 10 percent. Distance, as a factor that is presented in the analysis, in kilometers, is significant at the level of 1 percent, shows that the distance from Frankfurt, also known as the capital of the euro area, has a negative correlation with the level of attraction of foreign direct investment in the euro area. The EU variable although it shows that membership in the European Union is positive which means that membership in this union will have a positive impact on increasing the foreign direct investment, it is not significant. The other factor which is considered as the most important in this study is that Emu shows what impact has the membership of a country in the euro area on the level of foreign direct investment inflows. According to the results presented above, the impact of this factor is positive, the adoption of the euro as a national currency will result in an increase in the level of foreign direct investment in a country, and that its effect is significant at the level of 1 percent. However, the results should be taken with caution because the determinants used to estimate the investment variations, in this case, are explained by only 15 percent, so we have a model which does not have much explanatory power.

The test Breusch-Pagan / Cook-Weisberg, table 2, shows that chi2 is zero, which means that the data have heteroskedasticity and that standard errors are skewed.

**Table 2.** Breusch-Pagan / Cook-Weisberg

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	
Ho: Constant variance	
Variables: fitted values of investments	
chi2(1)	= 286.80
Prob > chi2	= 0.0000

Using the robust standard error method enables error bias to be corrected. According to this method not only the standard errors differ compared to the OLS method, but also has changed the importance of the coefficients of the variables has changed, which makes this method more reliable in explaining the model used. Namely, the GDP variable has become important at the level of 5 percent, the exchange rate has become important at the level of 1 percent and Emu has become important at the level of 1 percent.

**Table 3.** Robustness test

	robust	ols
	b	b
<i>GDP</i>	0.0103888	0.010389
<i>GDP growth</i>	1.59E+09	1.59E+09

<i>Exchange rate</i>	-1.17E+07	-1.17E+07
<i>Distance</i>	-2.36E+07	-2.36E+07
<i>Eu</i>	2.50E+09	2.50E+09
<i>Emu</i>	2.43E+10	2.43E+10
<i>_cons</i>	2.54E+10	2.54E+10

**Table 4.** Robust estimation

	robust	ols
	b/se	b/se
<i>GDP</i>	.0103888** 0.0031861	0.0103888 0.0053412
<i>GDP growth</i>	1.59E+09 9.60E+08	1.59E+09 8.17E+08
<i>Exchange rate</i>	-1.17e+07*** 2927501	-1.17E+07 1.76E+07
<i>Distance</i>	-2.36e+07*** 6383642	- 5367278
<i>Eu</i>	2.50E+09 2.88E+09	2.50E+09 9.75E+09
<i>Emu</i>	2.43e+10*** 5.82E+09	2.43e+10** 8.16E+09
<i>_cons</i>	2.54e+10** 9.72E+09	2.54e+10* 1.14E+10

The analysis of the foreign investments data according to the method of fixed effects, the results of which are presented in the second column, shows an approximate level of importance of the determinants used in the model. According to this method, GDP has a positive and significant effect at the level of 1 percent, at the same time GDP growth is positive and significant at the level of 5 percent, also the Emu, which shows the effect of the membership country in the euro area, has a positive impact on foreign investment and significant at the level of 5 percent. The other variables used in the regression, have a positive impact on investment, but they are not significant at any level.

The results presented in the third column show the regression analysis according to the random effects method. As in the two previous methods that were presented, the GDP and the GDP growth have a positive and significant effect at the level of 1 percent and 5 percent, respectively. The effect of euro area membership presented through the variable Emu, even according to the random method shows a positive effect of euro area membership on the investment level and this effect is significant at the level of 1 percent. Regarding other factors used in the regression, it is noticed that they do not have a significant impact on the investment level.

Since table 1, above presents the results of a regression equation analyzed with the help of three different methods, it will be necessary to define which of these three methods gives us the most accurate results. The manner in which the accuracy of the aforementioned methods is verified is based on the Hausman test and is presented below;

The comparison between the random model and the fixed effects model will be made first.

- Ho - presents the hypothesis that the model according to the random method is appropriate,
- H1 - presents the hypothesis that the model according to the fixed effects method is appropriate.

**Table 5.** Hausman test

$$\chi^2(4) = (b-B)'[(V_b - V_B)^{-1}](b-B)$$

$$= 4.74$$

$$\text{Prob} > \chi^2 = 0.3150$$

From the results of the Hausman test, we can observe the probability of the authenticity of the two hypotheses set out above. According to table 5, the probability is 31.5 percent, i.e., it is greater than 5 percent, which implies that the Ho hypothesis is the correct hypothesis and that the model according to the random method is more appropriate.

To have an even more accurate picture of these results the suitability of the random model can be re-verified by comparing it with the panel data model. Such a comparison can be made using the Brusch Pagan LM test.

- Ho - presents the hypothesis that the model according to the panel data method is appropriate,
- H1 - presents the hypothesis that the model according to the random method is appropriate.

**Table 6.** Brusch Pagan LM Test

$$\text{Investments}[\text{statecode}, t] = Xb + u[\text{statecode}] + e[\text{statecode}, t]$$

$$| \quad \text{Var} \quad \text{sd} = \sqrt{\text{Var}}$$

$$\text{invesne} \sim p \mid 3.64\text{e}+21 \quad 6.03\text{e}+10$$

$$e \mid 2.19\text{e}+21 \quad 4.68\text{e}+10$$

$$u \mid 1.27\text{e}+21 \quad 3.57\text{e}+10$$

$$\text{Test: } \text{Var}(u) = 0$$

$$\chi^2(01) = 268.36$$

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Prob > chibar2 = 0.0000

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From the Brusch Pagan LM test in terms of probability it is zero or almost zero, less than 5 percent, which implies that the  $H_0$  hypothesis must be rejected and the  $H_1$  hypothesis is accepted, i.e., the model according to the random method is appropriate. Both tests performed by Hausman and Brusch Pagan LM show that the model of the random effects method is the most appropriate model to interpret the data and that the analysis should be based on this model.

## 5. Discussion and conclusions

Membership in the euro area has a positive impact on investment incentives, from member countries. The common currency by creating an area with a low inflation rate and promoting stability enables private sector enterprises to reduce poor investment performance. Also, within area members, the cost of investment will be reduced by lower transaction costs and the uncertainty that the exchange rate may cause.

From the model and the three different methods used to assess the determinants that cause an increase in investments, investments from the euro area countries are significant. Through Hausman and Brusch Pagan LM test it is concluded that from all the methods used the method of the random effects is the most appropriate to analyze the data.

The study was conducted using panel, fixed, and random methods to analyze the collected data. The results are based on a limited number of factors for the analysis of the relationship between membership in the eurozone and foreign direct investments. The way the analysis was conducted may underestimate the determinant that can lead to an increase in investment for a member country. For further studies, other models and methods should be used to have a more complete overview of the factors analyzed in this paper.

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