**Ekonomski horizonti**, Septembar - Decembar 2022, Volumen 24, Sveska 3, 229 - 242
UDC: 33 ISSN: 1450-863 X
© Ekonomski fakultet Univerziteta u Kragujevcu
www. ekfak.kg.ac.rs

***Original scientific paper***
UDC: 330.322(4)
doi:10.5937/ekonhor2203229B

# THE CONTRIBUTION OF FOREIGN DIRECT INVESTMENT TO ECONOMIC GROWTH IN THE SELECTED EMERGING EUROPEAN COUNTRIES: THE EVIDENCE BASED UPON THE PANEL COINTEGRATION MODEL

Vlatka Bilas* and Sanja Franc

*Faculty of Economics and Business, University of Zagreb, Croatia*

This paper is aimed at examining the fact whether foreign direct investment (FDI) and exports do contribute to economic growth in the thirteen European Union (EU) new member states (namely Bulgaria, Croatia, Cyprus, Czech, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia) during the period from 2005 to 2020 or not. Various statistical tests were performed in order to examine the relationship and causality among the three observed series, including unit-root tests, the Kao and Pedroni cointegration tests, and finally the modified causality test. The obtained results are mixed. Although cointegration was established between FDI, exports and growth, the estimation of the long-term coefficients varied to such an extent that only ambiguous conclusions about the effect of FDI and exports on the growth of the real gross domestic product (GDP) could be reached. The research results imply the fact that positive effects of FDI and exports are neither automatic nor equal in all the countries, but the same rather depend on the many factors and conditions that the governments of the selected states should consider when designing policy measures for attracting FDI and promoting exports.

**Keywords:** foreign direct investment, gross domestic product, exports, the EU new member states, cointegration, causal relationship

JEL Classification: F21

## INTRODUCTION

The global economy has been showing signs of slowing down over the last decade, this being so especially due to the latest global health crisis. In order for countries to increase their competitiveness and living standards, it is necessary for them to increase productivity and economic growth, which is the reason why policymakers need to design quality and appropriate development programs and policies irrespective of the fact that the available instruments are limited. The tense global geopolitical situation, the current health pandemic and the consequential economic crises have all increased uncertainty,

* *Correspondence to*: V. Bilas, Faculty of Economics and Business, University of Zagreb, J. F. Kennedy square 6, 10000 Zagreb, Croatia; e-mail: vbilas@efzg.hr

reduced the willingness to invest and increased the possibility of supply shocks and changes in global supply chains. With low interest rates and reduced leverage, banks have become less interested in lending to enterprises, having focused on the activities that bring them higher fees and on trading. On the other hand, despite low borrowing costs, the public sector has not embarked on greater investments, mostly due to the public debt sustainability problems, particularly in developed countries.

The fact that foreign direct investment (FDI) and exports positively contribute to economic growth (Baiashvili & Gattini, 2020; Nguyen, 2020; Mohd & Muse, 2021) is commonly accepted. Their importance has significantly grown in the past few decades, especially in developing countries after market liberalization. The influence of foreign investments largely depends on the macroeconomic and business environments and the absorption capacity of the recipient country. The impact also differs among low-income and high-income countries (Baiashvili & Gattini, 2020). Technology and knowledge transfers are perhaps one of the most important ways in which FDI contributes to the recipient country. It is known that developing countries lag behind developed countries in terms of technological progress. Even if they have the same technology, enterprises in developing countries use it less efficiently because they do not have enough knowledge and skills. Because technology is not free and accessible to everyone, there is a big technological gap between developing and developed countries. Technology is an important element of innovation and innovation is an important factor in competitiveness. In order for developing countries to achieve a higher degree of competitiveness in the global market, they need to find ways to acquire more advanced technology. FDI could be the potential source of technology transfer (Grgić, Bilas & Franc, 2012). However, there is some evidence for developing countries that the impact of FDI on the recipient country's economy is stronger in the long run than in the short run (Gochero & Boopen, 2020).

FDI can have a positive effect on domestic enterprises in many ways due to the spillover of knowledge and skills. The presence of foreign enterprises can encourage the competitiveness of domestic enterprises due to the so-called demonstration effect. Namely, domestic enterprises can observe and learn from the positive and negative experiences of foreign enterprises. In developing countries, the market is often characterized by monopolistic competition. The emergence of foreign competition can change monopolistic conditions and have a positive effect on the productivity of domestic enterprises.

However, these positive spillovers are not automatic, nor are they guaranteed either. Although many economies compete to attract FDI, it is necessary to carefully consider the promotional strategies and incentives being offered to investors. The cost of incentives is expected to be recovered by means of the positive effects of FDI on the economy. Unless properly calculated, the cost of attracting FDI might overweigh its benefits. This is why it is necessary that countries should analyze and prepare for the expected effects of FDI on the economy. It is up to the government to design the policy instruments that would help their economy grow and become an attractive location for the desired type of FDI.

The effect of FDI and exports on economic growth is the research problem dealt with in this paper. The main aim implies examining whether FDI, exports and the GDP are cointegrated and causally connected with each other by using the sample of the new EU member states in the period from 2005 to 2020. Therefore, the research hypothesis tested in this paper reads as follows: "FDI and exports positively contribute to the GDP growth in the new EU member states". The hypothesis is tested using various statistical tests including unit-root tests, Kao and Pedroni cointegration tests and the modified Granger causality test. Based on the research results, certain policy implications are discussed. The emerging EU member states have all undergone market liberalization, deregulation and privatization. While some are internationally recognized as big FDI recipients, not all countries have exerted the same effects from those activities on their respective economies. Therefore, it is interesting to do research in those effects and draw a conclusion about the policy

implication. The paper consists of the five parts. The introduction is followed by a literature review. The third part of the paper is a methodology description, and the fourth part contains the research results and the discussion. The fifth part is the conclusion.

## LITERATURE REVIEW

In the last few decades, change in the volume and structure of trade and capital flows has been seen. While the relatively low levels of international capital movements were recorded in the 1990s, this volume has increased significantly in the last decades. Likewise, in the past, capital flows were mostly short-term and consisted mostly of bank loans, whereas more recent trends have been showing a strong increase in private capital flows.

A considerable number of research studies provide evidence on the positive effects of FDI on economic growth (Rahman, 2014; Nguyen, 2020; Mohd & Muse, 2021). However, there are also the studies that have not unambiguously proven the fact that FDI significantly contributes to economic growth (Simionescu, 2016; Sopta, Bilas & Franc, 2021).

More concretely, it is interesting to examine how FDI contributes to emerging economies. S. Mohd and A. N. Muse (2021) examined the correlation between FDI and growth in Ethiopia. The results showed the presence of a positive impact of FDI on the GDP, yet no causal relationship between the two variables was established as such. FDI positively contributes to economic growth and this impact is stronger in developing countries than in the developed (Baiashvili & Gattini, 2020). T. Dinh, D. Hong Vo, A. The Vo and T. C. Nguyen (2019) also used various statistical techniques to determine the effects of FDI on economic growth in developing countries. The authors came to the conclusion that FDI promoted growth in the long run, whereas the effect on economic growth was negative in the short run. S. Chaudhury, N. Nanda and B. Tyagi (2020) emphasized the role of the sectoral composition of FDI. They concluded that FDI promoted overall economic growth, whereas FDI had a negative effect on economic growth in the secondary sector specifically. N. Mamingi and K. Martin (2018) found that FDI exerted positive effects on economic growth only when there was an adequate absorptive capacity in the recipient country; otherwise, the effect was negative. FDI will positively affect growth if there is a stable government and the rule of law (Trojette, 2016). S. Hobbs, D. Paparas and M. E. AboElsoud (2021) found a unidirectional link between FDI, exports and the GDP in Albania. What was uncommon was the fact that growth had caused the inflow of FDI in the short run, not contrariwise. Using panel regression, K. Curwin and M. Mahutga (2014) found that a smaller inflow of FDI was better for the country and that sudden larger amounts of FDI could actually harm the recipient country's economy. M. Carkovic and R. Levine (2005) used a dynamic panel estimation technique and found no robust positive impact of FDI on economic growth either directly or indirectly through human capital levels. In a similar fashion, considering the EU post-transition countries, Y. Saglam (2017) found that FDI negatively contributed to economic growth in some countries included in the sample. Using panel data analysis and different cointegration and causality tests, the author concluded that there was but one-way causality from FDI to GDP *per capita*. S. Žiković, I. Žiković and M. Grdinić (2014) found that FDI positively affected economic growth in the long run in all Central European countries, expect in Croatia, where the impact was negative.

Beside FDI, openness to trade and an increase in exports are often considered to be a factor of growth, especially in emerging countries. Regarding the effects of exports on economic growth, the evidence mostly indicates to mixed results. Although exports are thought to be the engine of growth, this is not automatically achieved. For example, A. P. Ribeiro, V. Carvalho and P. Santos (2016) indicate that exports positively contribute to the economic growth of the EU countries, which is only so if it is specialized in high added value products. G. Dudzevičiūtė, A. Šimelytė and J. Antanavičienė (2017) researched the relationship between the GDP and exports on the case of the EU as well. They found that there was a unidirectional effect from the GDP to exports in 11

countries. In a smaller number of the countries, there was a unidirectional effect from exports to the GDP, or a bidirectional relationship between the variables. A. Tsitouras and C. Nikas (2016) investigated the contribution of FDI and exports in 15 post-transition EU countries. They found that the two variables positively contributed to the GDP growth only in the countries which had joined the EU in 2004. For the rest of the sample, that contribution was not confirmed. A. Aravaci and I. Ozturk (2012) analyzed the causal relationship between FDI, exports and growth in the EU transition economies. They obtained mixed results. The results of the Granger causality test revealed that there was a long-term relationship and causality between the variables in only four of the ten EU transition countries included in the sample. Interestingly, F. Carril-Caccia and E. Pavlova (2018) state in their research done for the European Central Bank that FDI and exports are no longer seen as substitutes, but rather as complements. In many cases, horizontal, vertical, export-supporting and export-platform FDI promotes trade.

## METHODOLOGY

FDI and exports are considered as the important factors of growth (Sultanuzzaman, Fan, Mohamued, Hossain & Aminul, 2019). In order to determine the relationship between FDI, the exports of goods and services (EXP) and economic growth (GDP) in the EU new member states, the annual data from 2005 to 2020 were used for 13 countries. Table 1 explains the variables used in the research and the data transformations.

After the necessary data transformations, various statistical tests were done so as to examine the relationship and causality among the three series. Firstly, the unit-root test was performed in order to check the stationarity of the time series. Then, Pedroni and Kao cointegration tests were carried out and the ARDL panel cointegration model was performed in order to examine the long-term relationship among the series (Cetintas & Barisik, 2009; Tomić, Šimurina & Jovanov, 2020). Finally, the causality test was performed to determine whether there is a causal relationship among the variables or not. The use of different statistical techniques ensures the robustness of the results and the related conclusions.

## RESULTS AND DISCUSSION

### Unit-root tests results

All the available panel unit-root tests in EViews v. 10 were conducted. Firstly, the results of the first-generation tests are presented in Table 2. However, those tests do not consider the dependence among the variables, so additional tests were applied (Table 3 and Table 4).

First-generation tests do not consider possible cross-sectional dependences, i.e. they assume cross-sectional independence. Therefore, the second-generation panel unit-root tests were applied. The null hypothesis in the Pesaran CIPS test reads that all the panels are nonstationary and contain a unit root, whereas the alternative hypothesis reads that some panels are stationary. The Pesaran CIPS test results indicate that the null hypothesis should be rejected at the 1% significance level for all but two series (EXP1/GDP and EXP2/GDP) and for the series FDI1/GDP in the model with the trend.

Because of the strong cross-sectional dependence, the results of the Pesaran CPIS test are considered to be more reliable than those of the first-generation tests. However, since quite a short time series (15 observations only) is being dealt with, even the Pesaran CIPS test results should be taken with some doubt because of its lower power when time series are short.

Additional tests were applied in order to test the cross-sectional dependence. In this case, the null hypothesis reads that there is no cross-sectional dependence at all.

The results of all the cross-sectional dependence tests (Breusch-Pagan, Pesaran scaled, Bias-corrected

**Table 1** The variables and data transformations

| Variable | Description | Source of data |
|---|---|---|
| New EU member states | Bulgaria, Croatia, Cyprus, Czech, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia | World Bank database |
| GDP | Gross domestic product (constant, 2010, U.S. dollars) | World Bank database |
| FDI | Annual net inflow of FDI (Balance of payments, current US$) | World Bank database |
| rGDP | Gross domestic product growth (annual %) | World Bank database |
| FDI% | FDI, net inflows (% of GDP) | World Bank database |
| E1 | Exports of goods and services (Balance of payments, current US$) | World Bank database |
| E2 | Exports of goods and services (% of GDP) | World Bank database |
| GDP deflator | GDP deflator: linked series (base year varies by country) | World Bank database |
| rtGDP | Special LOG transformation of the GDP annual growth (rGDP) because this series contains negative values. | World Bank database |
| GDP def2010 | Since the base year varies by country, we have converted all GDP deflator series to the base year 2010=100 | World Bank database |
| FDI2010 | = FDI/GDP_def2010 | World Bank database |
| FDI2010 GDP2 | = FDI2010/GDP2*100 (%) | World Bank database |
| E12010 | = E1/GDP_def2010 | World Bank database |
| E12010 GDP2 | = E12010/GDP2*100 (%) | World Bank database |
| LtFDI% | Special LOG transformation of the FDI% series because this series contains negative values. The following notation for this series was used: FDI1/GDP | World Bank database |
| LtFDI2010 GDP2 | Special LOG transformation of the FDI2010 GDP2 series because this series contains negative values. The following notation for this series was used: FDI2/GDP | World Bank database |
| LE12010 GDP2 | LOG transformation of the E12010 GDP2 series. The following notation for this series was used: EXP2/GDP | World Bank database |
| LE2 | LOG transformation of the E2 series. The following notation for this series was used: EXP1/GDP | World Bank database |

Note: Special LOG transformations are performed by the EViews program due to the negative values in the GDP and FDI series.

*Source*: Authors

scaled, Pesaran) reject the null hypothesis for no cross-sectional independence. These results recommend the use of the second-generation panel unit-root tests. In the next phase of the research, all the series are assumed to be integrated I(1).

## Panel cointegration tests results

In the following part of the analysis, two methodological approaches are used in order to assess the long-term relationship in the panels: the P. Pedroni (1999; 2004) and C. Kao (1999) tests. Table 5 contains the results of the Pedroni panel cointegration tests for the two options of FDI and exports (EXP) series. The Pedroni test was used in two variants: with a constant only and with both the constant and the trend.

With two exceptions (the first two panel tests and the first group test), all the tests reject the null hypothesis for no cointegration and indicate the existence of cointegration between the GDP, FDI and exports for the new members of the European Union panel. In other words, the results are indicative of the existence of correlation among the variables.

C. Kao (1999) advanced the cointegration analysis and presented the parametric residual-based

**Table 2** The results of the first-generation unit-root tests

| Variables | | Null hypothesis: unit root - common root | | Null hypothesis: unit root - individual root | | | Null hypothesis: stationarity | |
|---|---|---|---|---|---|---|---|---|
| | | Levin, Lin & Chu *t*-statistic | Breitung *t*-statistic | Im, Pasaran & Shin *W*-statistic | ADF Fisher Chi-square | PP Fisher Chi-square | Hadri Z-statistic | Heteroscedastic consistent Z-statistic |
| Level | rGDP | -0.26 (.40) | 2.80 (.99) | -1.29 (.10) | 31.32 (.22) | 23.86 (.58) | 3.55 (<.01) | 3.58 (<.01) |
| | FDI1/GDP | -6.66 (<.01) | -2.97 (<.01) | -2.74 (<.01) | 56.64 (<.01) | 66.08 (<.01) | 8.87 (<.01) | 8.52 (<.01) |
| | FDI2/GDP | -6.55 (<.01) | -6.97 (<.01) | -4.85 (<.01) | 66.28 (<.01) | 50.33 (<.01) | 7.30 (<.01) | 9.01 (<.01) |
| | EXP1/GDP | 0.20 (.58) | 2.35 (.99) | 1.38 (.92) | 17.05 (.91) | 10.09 (.99) | 6.15 (<.01) | 5.79 (<.01) |
| | EXP2/GDP | -4.52 (<.01) | 1.16 (.88) | -0.28 (.39) | 23.50 (.60) | 35.82 (.10) | 8.51 (<.01) | 13.79 (<.01) |
| The first difference | ΔrGDP | -8.73 (<.01) | -0.67 (.25) | -6.39 (<.01) | 83.91 (<.01) | 100.19 (<.01) | 7.28 (<.01) | 13.26 (<.01) |
| | ΔFDI1/GDP | -10.73 (<.01) | -3.72 (<.01) | -6.60 (<.01) | 110.85 (<.01) | 190.63 (<.01) | 21.63 (<.01) | 24.35 (<.01) |
| | ΔFDI2/GDP | -10.16 (<.01) | -6.01 (<.01) | -8.58 (<.01) | 107.83 (<.01) | 169.90 (<.01) | 5.67 (<.01) | 20.25 (<.01) |
| | ΔEXP1/GDP | -5.28 (<.01) | -4.07 (<.01) | -4.13 (<.01) | 60.78 (<.01) | 76.64 (<.01) | 4.57 (<.01) | 9.38 (<.01) |
| | ΔEXP2/GDP | -12.09 (<.01) | -5.22 (<.01) | -9.40 (<.01) | 118.04 (<.01) | 187.98 (<.01) | 15.90 (<.01) | 26.58 (<.01) |

Note: Individual effects and individual linear trends are excluded. The Schwarz criterion, the Newey-West automatic bandwidth selection and the Bartlett kernel were used.

*Source*: Authors

panel cointegration. The results of the Kao panel cointegration test are accounted for in Table 6.

Basically, all the Kao tests reject the null hypothesis for no cointegration at the significance level of 1%. Overall, the results of the Pedroni and Kao tests are supportive of the existence of cointegration between the rGDP, FDI1/GDP and EXP1/GDP and between the rGDP, FDI2/GDP and EXP2/GDP in the new EU members.

## The ARDL model estimation

The autoregressive distributed lag model (ARDL) is useful for forecasting long-term relationships among variables. In this model, the rGDP is the dependent variable and two different alternatives of the models are used (with and without the constant).

The results reveal that the rate of the adjustment back to (long-term) equilibrium is 56.89% (the model with the constant) and 58.13% (the model with the trend) significant at the less than 1% significance level (Table 7). In the short run, all the coefficients are significant at the less than 1% significance level in both models with the constant and the trend. The long-term coefficients are all negative and mostly statistically significant (the FDI2/GDP coefficient in the model with the trend is not significant). In the short run, an increase in both FDI2/GDP and EXP2/GDP would lead to an increase in the rGDP, i.e. in economic growth. However, that is not the case in the long run, at least not so in the period from 2005 to 2020, when both series had a negative impact on the economic growth series. It should be also noticed that in both the long-term and short-term the impact of exports on economic growth is greater multiple times than that of FDI.

**Table 3** The Pesaran CIPS test results

| Variable | Without the trend | With the trend |
|---|---|---|
| Level | | |
| rGDP | -2.63*** | -2.84** |
| FDI1/GDP | -2.68*** | -2.65 |
| FDI2/GDP | -2.80*** | -2.89** |
| EXP1/GDP | -1.74 | -1.96 |
| EXP2/GDP | -1.73 | -2.46 |
| First difference | | |
| ΔrGDP | -3.91*** | -3.70*** |
| ΔFDI1/GDP | -3.39*** | -3.44*** |
| ΔFDI2/GDP | -4.49*** | -4.38*** |
| ΔEXP1/GDP | -2.69*** | -2.80** |
| ΔEXP2/GDP | -2.89*** | -2.67* |

Note: The Wald test of the composite linear hypothesis is used. Significance at the 10 percent (*), 5 percent (**), and 1 percent (***) confidence levels.

*Source*: Authors

Hence the results of the cointegration test confirm the fact that there is a long-term relationship between the rGDP, FDI2/GDP and EXP2/GDP series in the case of the new EU member countries.

## Granger causality analysis

Firstly, it was tested whether any pair of series Granger-cause the remaining, i.e. third series. These test results are presented in the first six rows of Table 8. In all the six cases, the null hypothesis of no-Granger-causality was rejected at least at the 5% significance level. To make clearer these results, Granger noncausality was tested for each series separately using univariate tests. These test results are presented in the remaining rows of Table 8. The fact that the test results depend on the definition of the FDI and the exports of goods and services series can be noticed, while for the three series rGDP, FDI1/GDP and EXP1/GDP there is a unidirectional causal relationship from FDI to the GDP to the real GDP growth rate and from the real GDP growth rate to the exports of goods and services to the GDP. In the case of the other three series: rGDP, FDI2/GDP and EXP2/GDP, three bi-directional causal relationships were detected between each of these three series.

In the multivariate systems, when all the three series are included (rGDP, FDI1/GDP and EXP1/GDP or rGDP, FDI2/GDP and EXP2/GDP), the test results

**Table 4** The cross-sectional dependence test statistics

| Variable | Breusch-Pagan LM | Pesaran scaled LM | Bias-corrected scaled LM | Pesaran CD |
|---|---|---|---|---|
| Level | | | | |
| rGDP | 685.14 | 48.61 | 48.18 | 25.74 |
| FDI1/GDP | 171.90 | 7.52 | 7.05 | 7.73 |
| FDI2/GDP | 390.54 | 25.02 | 24.56 | 14.12 |
| EXP1/GDP | 747.34 | 53.59 | 53.16 | 26.65 |
| EXP2/GDP | 546.12 | 37.48 | 37.05 | 21.83 |
| First difference | | | | |
| ΔrGDP | 657.79 | 46.42 | 45.99 | 25.03 |
| ΔFDI1/GDP | 115.95 | 3.04 | 2.57 | 3.93 |
| ΔFDI2/GDP | 179.52 | 8.13 | 7.66 | 7.06 |
| ΔEXP1/GDP | 385.51 | 24.62 | 24.19 | 17.23 |
| ΔEXP2/GDP | 719.82 | 51.39 | 50.95 | 26.41 |

Note: The cross-section means were removed during the computation of correlations. The degree of freedom is 378 for all the tests. *P*-values for all the test statistics are less than 1%.

*Source*: Authors

**Table 5** The Pedroni test results

| Statistic | rGDP, FDI1/GDP & EXP1/GDP | | rGDP, FDI2/GDP & EXP2/GDP | |
|---|---|---|---|---|
| | Constant | Constant & Trend | Constant | Constant & Trend |
| Panel-v | -0.35 | -2.30 | -1.08 | -3.06 |
| Panel-ρ | -1.18 | 0.63 | -0.22 | 1.28 |
| Panel-Phillips-Perron t | -5.43*** | -6.17*** | -3.06*** | -5.18*** |
| Panel-Augmented Dickey-Fuller t | -5.27*** | -5.46*** | -4.13*** | -6.92*** |
| Group-ρ | 0.14 | 1.93 | 0.81 | 1.70 |
| Group- Phillips-Perron t | -6.69*** | -6.84*** | -4.04*** | -6.63*** |
| Group-Augmented Dickey-Fuller t | -6.06*** | -5.55*** | -4.25*** | -7.04*** |

Note: The test results generated by EViews. The Pedroni panel statistics are weighted. Significance at the 10 percent (*), 5 percent (**), and 1 percent (***) confidence levels.

*Source*: Authors

**Table 6** The Kao panel cointegration test results

| Statistic | rGDP, FDI1/GDP & EXP1/GDP | | rGDP, FDI2/GDP & EXP2/GDP | |
|---|---|---|---|---|
| | (a) | (b) | (a) | (b) |
| Modified Dickey-Fuller (DF) t | -1.28* | -3.53*** | -1.42* | -5.57*** |
| DF t | -3.63*** | -4.72*** | -3.47*** | -5.85*** |
| Augmented DF t | -4.35*** | -4.63*** | -4.51*** | -5.71*** |
| Unadjusted modified DF t | -6.10*** | -6.26*** | -7.01*** | -7.68*** |
| Unadjusted DF t | -6.01*** | -5.68*** | -6.14*** | -6.41*** |

Note: The test results generated by the Stata command xtcointtest. (a) Cross-sectional means not removed, (b) Cross-sectional means removed. Significance at the 10 percent (*), 5 percent (**), and 1 percent (***) confidence levels.

*Source*: Authors

in rows 1 and 4 in Table 8 suggest that both the FDI and the exports of goods and services series taken together Granger-cause the real GDP growth rate. The result is consistent with the panel cointegration results, where the cointegration relationship between these three series was established. The mixed results for each individual series in Table 8 are in some way consistent with the mixed results presented in Table 7, where the direction, intensity and significance of the impact FDI and the exports of goods and services series have on the real GDP growth rate depends on the estimation method and the software algorithm used. Therefore, there is ambiguous evidence regarding the impact of FDI and the exports series on the GDP growth rate in the EU emerging countries. The reason for such a conclusion lies in the fact that the results depend on the definition of FDI and the exports of goods and services series. The short time series might also have contributed to such nonconclusive results. Similar mixed results are also revealed in Y. Salgam (2017) and partly in J. Miteski and D. Janevska Stefanova (2017), who researched the contribution of FDI to economic growth in Central European and Southeastern European countries and found that the impact of FDI depended on the sectoral composition. They found that FDI did not have any statistically significant impact on economic growth in the construction sector.

## Policy implications

The above results imply that the positive effects of FDI and exports are neither automatic nor equal in

**Table 7** The ARDL model results

| Variable | Constant | | | Linear trend | | |
|---|---|---|---|---|---|---|
| | Coefficient | *t*-statistic | *P*-value | Coefficient | *t*-statistic | *P*-value |
| | Long-run equation | | | | | |
| FDI2/GDP | -0.0019 | -1.78 | .08 | 0.0006 | 0.61 | .54 |
| EXP2/GDP | -0.9068 | -1.11 | .27 | -1.1472 | -1.48 | .14 |
| | Short-run equation | | | | | |
| Cointegration equation | -0.5689 | -7.41 | <.01 | -0.5813 | -6.00 | <.01 |
| ΔFDI2/GDP | 0.0573 | 2.22 | .03 | 0.0546 | 2.17 | .03 |
| ΔEXP2/GDP | 3.1902 | 3.41 | <.01 | 3.5759 | 3.61 | <.01 |
| Trend | | | | 0.0245 | 4.32 | <.01 |
| Constant | 1.3106 | 6.39 | <.01 | 0.7889 | 3.66 | <.01 |

Note: The Schwarz criterion (SIC) was used. The ARDL(1,1,1) model with the constant and thee ARDL(1,1,1) model with the trend were selected.

*Source*: Authors

**Table 8** The improved Granger panel causality test

| Null hypothesis | Wald statistic | Decision |
|---|---|---|
| (FDI1/GDP & EXP1/GDP) does not Granger-cause rGDP | 10.05*** | Not accepted |
| (rGDP & EXP1/GDP) does not Granger-cause FDI1/GDP | 29.22*** | Not accepted |
| (rGDP & FDI1/GDP) does not Granger-cause EXP1/GDP | 22.03*** | Not accepted |
| (FDI2/GDP & EXP2/GDP) does not Granger-cause rGDP | 596.26*** | Not accepted |
| (rGDP & EXP2/GDP) does not Granger-cause FDI2/GDP | 880.66*** | Not accepted |
| (rGDP & FDI2/GDP) does not Granger-cause EXP2/GDP | 24.20*** | Not accepted |
| rGDP does not Granger-cause FDI1/GDP | 0.13 | Accepted |
| FDI1/GDP does not Granger-cause rGDP | 9.42*** | Not accepted |
| rGDP does not Granger-cause EXP1/GDP | 108.07*** | Not accepted |
| EXP1/GDP does not Granger-cause rGDP | 0.47 | Accepted |
| rGDP does not Granger-cause FDI2/GDP | 31.77*** | Not accepted |
| FDI2/GDP does not Granger-cause rGDP | 99.17*** | Not accepted |
| rGDP does not Granger-cause EXP2/GDP | 15.31*** | Not accepted |
| EXP2/GDP does not Granger-cause rGDP | 8.96*** | Not accepted |
| FDI1/GDP does not Granger-cause EXP1/GDP | 0.36 | Accepted |
| EXP1/GDP does not Granger-cause FDI1/GDP | 0.55 | Accepted |
| FDI2/GDP does not Granger-cause EXP2/GDP | 26.80*** | Not accepted |
| EXP2/GDP does not Granger-cause FDI2/GDP | 119.51*** | Not accepted |

Note: The BIC criterion is used. Significance at the 10 percent (*), 5 percent (**), and 1 percent (***) confidence levels. The decision was based on the 5% significant level.

*Source*: Authors

all the countries. They depend upon the many factors and conditions in the country that the government should consider when designing policy measures for attracting FDI and promoting exports. The companies taking FDI into consideration most often base their decisions on the availability of certain resources, the market size or another strategic advantage.

The significance of FDI is derived from a broader perspective. Access to the capital market and financial products is key to financing growth and development. While developed countries have much easier access to capital, developing countries have only begun the process of financial integration in recent decades. The domestic enterprises that are the drivers of the economy in developed countries usually have more sources of financing available on more favorable terms, whereas enterprises in developing countries are characterized by a higher degree of risk and therefore have stricter borrowing conditions. Banks and other external sources of financing disfavor risk and risky investments and often use a broad range of higher interest rates on loans in order to protect themselves from such investments, which means that the loan applicants whose claims seem to be risky are faced with very high interest rates on loans and their access to larger amounts of funding is difficult and limited. Private capital serves as an alternative in these circumstances. Foreign investors can be the source of so much needed capital.

Strategies and instruments for attracting FDI change over years as the expected benefits from such investments change as well. As competition to attract FDI is stronger, it is not uncommon for countries to compete with each other in the scope, value or type of incentives they offer. Governments seek to attract foreign investment projects by offering greater incentives than their competitors or they are creating incentive policies in response to incentives from other countries. Traditional measures and preconditions for attracting FDI are often no longer sufficient to achieve the best possible results, such as technology transfer, higher exports, higher employment, and the like. The market-friendly strategies that used to assume liberalized regimes and reduced barriers to foreign investments, the standards of preferential treatment for foreign investors and a greater role in the resource allocation process given to market forces are the basis for attracting FDI. Some economies can be very successful in attracting foreign investors by implementing such policies, whereas the existence of a healthy and stable economic and political environment to support this is an important prerequisite (Grgić *et al*, 2012).

In the case of targeted competition when the government offers greater incentives than its competition does, those incentives can be particularly high when speaking about big and expensive projects, and investors are indifferent between alternative locations. There are the cases when targeted competition for FDI has resulted in competitive wars, in which unprecedentedly high and even economically unsustainable incentives have been offered (OECD, 2003).

FDI policy instruments should be designed based on the state and orientation of the economy. As follows, if the economy is based on the primary sector, then the government should work on improving the regulatory framework, especially the land acquisition procedure, transaction laws and property rights. If the economy is based on manufacturing, then the government should concentrate on the institutional framework and relieving the administrative burden for investors. In case the economy is based more on the tertiary sector, creating linkages, intellectual property rights and regulating services should be prioritized.

There are various criteria for determining the usefulness of incentives, some of which are based on the efficiency, i.e. on estimating whether the same benefits could be achieved at lower costs, opportunity costs, and the reaction of the competition. If incentives provoke a reaction and increased incentives from other competing countries, it can lead to overspending, the domestic economy ultimately being adversely affected. In the international context, countries should design incentives deemed to be optimal from the point of view of domestic objectives, also considering the imperative of competition with other countries.

Finally, the results of this paper indicate that FDI and exports are not necessarily the engines of economic

growth. Although FDI contributes to growth according to theory, the empirical evidence does not confirm this without a doubt. In fact, there are rather mixed empirical results, which leads to the conclusion that incentives to foreign investors should be carefully designed and that incentives alone are not enough to generate the expected benefits for the economy.

## CONCLUSION

Market liberalization and globalization have spurred trade and FDI, consequently leading to the growth of their economic importance. Since developing countries are usually less open, less technologically advanced, less skilled and with less capital than the developed, FDI can be a valuable source of capital, production and growth. Countries should have an adequate strategy and FDI attracting instruments in place. However, as is shown in the paper, the benefits generated from FDI are neither guaranteed nor equally distributed among the countries. Using annual time series for the new European Union member states in the period from 2005 to 2020, the results point to the two main conclusions. Firstly, the GDP, FDI and exports are cointegrated. This conclusion implies a long-term relationship between the tested series.

The results of the long-term coefficient estimation in panel cointegrating regressions based on different estimators and algorithms, however, demonstrate great variations, which is a limitation preventing us from making a clear and definite conclusion about the size and direction of the impact that FDI and the exports of goods and services may have on the real GDP growth. Secondly, the results of the causality test indicate that, in multivariate systems, FDI and the exports of goods and services taken together Granger-caused the real GDP growth. When the pairs of the series are considered, there are certain mixed results about the causality direction. However, these results are in line with the results of the long-term coefficient estimation in the panel cointegrating regressions. In other words, based on the causality test results, it is only ambiguous conclusions about the positive impact of FDI and the exports of goods and services on the real GDP growth in the new EU member states that could be reached, and the research hypothesis cannot be confirmed. Such results imply that national strategic and policy measures for promotion and attraction of FDI and exports should carefully be calculated as the expected positive effects are not assured. The final effect that FDI will have on the recipient economy depends on numerous factors, including the recipient economy's institutional framework, macroeconomic and political stability, business climate, human capital and so forth. The short time series are the main limitation of this study. In future research, the model could be estimated using higher-frequency data (quarterly or monthly) to support nonstationary heterogeneous panel models, which would capture the particularities of specific post-transition European countries.

## REFERENCES

Aravaci, A., & Ozturk, I. (2012). Foreign direct investment, export and economic growth: Empirical evidence from new EU countries. *Romanian Journal of Economic Forecasting*, *2*(2012), 52-67.

Baiashvili, T., & Gattini, L. (2020). Impact of FDI on economic growth: The role of country income levels and institutional strength. *EIB Working Papers 2020/02*, European Investment Bank.

Carril-Caccia, F., & Pavlova, E. (2018). Foreign direct investment and its drivers: A global and EU perspective. *ECB Economic Bulletin*, *4*(2018).

Carkovic, M., & Levine, R. (2005). Does Foreign Direct Investment Accelerate Economic Growth. *Working Paper*, Institute for International Economics. University of Minnesota Department of Finance.

Curwin, K., & Mahutga, M. (2014). Foreign direct investment and economic growth: New evidence from post-socialist transition countries. *Social Forces*, *92*(3), 1159-1187. doi:10.1093/sf/sot128

Chaudhury, S., Nanda, N., & Tyagi, B. (2020). Impact of FDI on economic growth in South Asia: Does nature of FDI matters? *Review of Market Integration*, *12*(1-2) 51-69. doi:10.1177/0974929220969679

Dinh, T., Hong Vo, D., The Vo, A., & Nguyen, T. C. (2019). Foreign direct investment and economic growth in the Short Run and Long Run: Empirical evidence from developing countries. *Journal of risk and financial management*, *12*(4), 176. doi:10.3390/jrfm12040176

Dudzevičiūtė, G., Šimelytė, A., & Antanavičienė, J. (2017). Causal nexus between export and economic growth in European Union countries. *Montenegrin Journal of Economics*, *13*(2), 107-120. doi:10.14254/1800-5845/2017.13-2.6

Gochero, P., & Boopen, S. (2020). The effect of mining foreign direct investment inflow on the economic growth of Zimbabwe. *Journal of Economic Structures*, *9*(1), 1-17. doi:10.1186/s40008-020-00230-4

Grgić, M., Bilas, V., & Franc, S. (2012). *Inozemna izravna ulaganja i ekonomski razvoj* (F*oreign direct investments and economic development*). Zagreb, HR: Ekonomski fakultet.

Cetintas, H., & S. Barisik, S. (2009). Export, import and economic growth: The caseof transition economies. *Transition Studies Review, 15*(4), 636-649, doi:10.1007/s11300-008-0043-0

Hobbs, S., Paparas, D., & AboElsoud, M. E. (2021). Does foreign direct investment and trade promote economic growth? Evidence from Albania. *Economies*, *9*(1), 1-19. doi:10.3390/economies9010001

Kao, C. (1999). Spurious regression and residual-based tests for cointegration in panel data. *Journal of Econometrics*, *90*(1), 1-44. doi:10.1016/S0304-4076(98)00023-2

Mamingi, N., & Martin, K. (2018). Foreign direct investment and growth in developing countries: Evidence from the countries of the Organisation of Eastern Caribbean States. *CEPAL Review*, 124, 79-98. doi:10.18356/e270b670-en

Miteski, M., & Janevska Stefanova, D. (2017). The impact of sectorial FDI on economic growth in Central, Eastern and Southeastern Europe. *Working Paper No. 1/2017,* National Bank of Republic of Macedonia.

Mohd, S., & Muse, A. N. (2021). Impact of foreign direct investment on economic growth in Ethiopia: Empirical evidence. *Latin American Journal of Trade Policy*, *4*(10), 56-77. doi:10.5354/0719-9368.2021.61853

Nguyen, C. H. (2020). The impact of foreign direct investment, aid and exports on economic growth in Vietnam. *Journal of Asian Finance, Economics and Business*, *7*(10), 581-589. doi:10.13106/jafeb.2020.vol7.no10.581

OECD. (2003). Checklist for foreign direct investment incentive policy. Retrieved August 1, 2018, from http://www.oecd.org/dataoecd/45/21/2506900.pdf

Pedroni, P. (1999). Critical values for cointegration tests in heterogeneous panels with multiple regressors. *Oxford Bulletin of Economics and Statistics*, *61*(S1), 653-670. doi:10.1111/1468-0084.0610s1653

Pedroni, P. (2004). Panel cointegration: Asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. *Econometric Theory*, *20*(3), 597-625. doi:10.1017/S0266466604203073

Rahman, Z. U. (2014). Impact of foreign direct investment on economic growth in Pakistan. *Journal of Economics and Sustainable Development*, *5*(27), 251-255. doi:10.21058/gjecs.2019.42004

Ribeiro, A. P., Carvalho, V., & Santos, P. (2016). Export-led growth in the EU: Where and what to export? *The International Trade Journal*. *30*(4), 319-344. doi:10.1080/08853908.2016.1197806

Salgam, Y. (2017). FDI and economic growth in european transition economies: Panel data analysis. *Journal of Yasar University*, *12*(46), 123-135.

Sopta, M., Bilas, V., & Franc, S. (2021). Cointegration and causality analysis between foreign direct investment, exports and economic growth in the Republic of Croatia. *Management*: *Journal of Contemporary Management Issues*, *26*(2), 145-158. doi:10.30924/mjcmi.26.2.8

Sultanuzzaman, R., Fan, H., Mohamued, E., Hossain, I., & Aminul, M. (2019). Effects of export and technology on economic growth: Selected emerging Asian economies. *Economic Research - Ekonomska Istraživanja*, *32*(1), 2515-2531. doi:10.1080/1331677X.2019.1650656

Simionescu, M. (2016). The relation between economic growth and foreign direct investment during the economic crisis in the European Union. *Zbornik radova Ekonomskog fakulteta u Rijeci*, *34*(1), 187-213. doi:10.18045/zbefri.2016.1.187

Tomić, D., Šimurina, J., & Jovanov, K. (2020). The nexus between economic sentiment indicator and gross domestic product: A panel cointegration analysis. *International Review of Economics & Business*, *23*(1), 121-140. doi:10.2478/zireb-2020-0008

Trojette, I. (2016). The effect of foreign direct investment on economic growth: The institutional threshold. *Région et Développement*, *43*, 111-138.

Tsitouras, A. & Nikas, C. (2016). The dynamic links between exports, foreign direct investment, and economic growth: Evidence from European transition economies. *Journal of East-West Business*, *22*(3), 198-235. doi:10.1080/10669868.2016.1180658

Žiković, S., Žiković, I., & Grdinić, M. (2014). Detangling growth, exports, imports and FDI knot in selected CEE countries. *Working paper 2014-001*, Faculty of Economics University of Rijeka.

*Received on 13th June 2022,*
*after revision,*
*accepted for publication on 24th November 2022.*
*Published online on 6th December 2022.*

***Vlatka Bilas,*** PhD is a full professor at the Faculty of Economics and Business, Department of International Economics, University of Zagreb. She is the Head of the Department.

***Sanja Franc,*** PhD is an associate professor at the Faculty of Economics and Business, Department of International Economics, University of Zagreb.

# DOPRINOS STRANIH DIREKTNIH INVESTICIJA EKONOMSKOM RASTU IZABRANIH EVROPSKIH ZEMALJA NOVIH ČLANICA EVROPSKE UNIJE - DOKAZ ZASNOVAN NA MODELU PANEL KOINTEGRACIJE

Vlatka Bilas i Sanja Franc

*Faculty of Economics and Business, University of Zagreb, Croatia*

Ovaj rad ima za cilj da se ispita da li strane direktne investicije (SDI) i izvozne aktivnosti doprinose ekonomskom rastu u trinaest država novih članica Evropske unije - EU (Bugarska, Hrvatska, Kipar, Češka, Estonija, Mađarska, Letonija, Litvanija, Malta, Poljska, Rumunija, Slovačka i Slovenija), u periodu 2005-2020. Sprovedena su razna statistička testiranja u cilju ispitivanja veze i uzročno-posledičnih odnosa između tri posmatrane serije, uključujući testove jediničnog korena, Kaov i Pedronijev test kointegracije i, konačno, modifikovani test uzročno-posledičnih odnosa. Rezultati su heterogeni. Iako je utvrđeno postojanje kointegracije između SDI, izvoznih aktivnosti i rasta, rezultati se razlikuju u pogledu procene dugoročnih koeficijenata do te mere da se mogu izvesti samo nejasni zaključci o efektu SDI i izvoznih aktivnosti na stvarni rast bruto domaćeg proizvoda (BDP). Na osnovu rezultata sprovedenog istraživanja, proizilazi da pozitivni efekti SDI i izvoznih aktivnosti nisu ni automatski ni jednaki u svim zemljama, već da isti zavise od mnogih faktora i uslova, koje bi vlade tih zemalja trebalo da razmotre prilikom kreiranja mera politike privlačenja SDI i promovisanja izvoznih aktivnosti.

**Ključne reči:** strane direktne investicije, bruto domaći proizvod, izvozne aktivnosti, države nove članice Evropske unije, kointegracija, uzročno-posledične veze

JEL Classification: F21