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IMPACT OF FOREIGN DIRECT INVESTMENT ON THE ECONOMIC GROWTH OF THE NEW MEMBER STATES FROM CENTRAL AND EASTERN EUROPE

The goal of this paper is to study the effects of foreign direct investment (FDI) on the economic growth of ten new member states (NMS) from Central and Eastern Europe (CEE), which joined the European Union (EU) in 2004 and 2007 – the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia, Bulgaria and Romania. Croatia is excluded from the analysis since it became a EU member relatively late - in 2013. A vector autoregression (VAR) of annual data for the period 2007-2019 is employed. The empirical results indicate that FDI does not affect the real GDP growth rate of the NMS from CEE. The research results also show that FDI Granger-causes the economic growth of the NMS from CEE neither in the short run nor in the long term.

Keywords: *new member states, economic growth, foreign direct investment, vector autoregression*

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1. INTRODUCTION

The influence of FDI on economic growth has been heavily debated in economic literature for a long time. It is an important issue of macroeconomic management, especially for small open economies with limited amounts of national saving and domestic investment like the NMS from CEE.

Apostolov (2016) studied the effects of foreign direct investment in the economies of South-East Europe. Six countries were selected for this purpose and a sample was drawn up for Albania, Bosnia and Herzegovina, Croatia, Macedonia, Serbia and Slovenia. Enterprise surveys of the World Bank were used. The concept behind this analysis was to examine the effects of the contribution of foreign direct investment to the development of local businesses and the overall economy. Apostolov (2016) found a positive relationship between FDI and GDP in all analyzed economies.

Hlavacek and Bal-Domanska (2016) analyzed the foreign direct investment and its impact on economic growth in Central and Eastern European countries between 2000 and 2012, focusing on the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia. The methodology applied in the first part involved a comparative analysis of trends in foreign investment and gross domestic product, and in the second, a growth model based on the endogenous growth theory. The results showed that Estonia, followed by Hungary, the Czech Republic and Slovakia, accounted for the largest volume of foreign direct investment for GDP production. The second part of the research indicated statistically significant relationships between economic growth, FDI and investment growth.

Melnyk et al. (2014) investigated the impact of foreign direct investment on economic growth in the post-communist transition economies. They used a neoclassical growth model and concluded that the foreign investments positively affected the economic growth.

Miernik (2016) ascertained no significant link between FDI and growth in Central and Eastern European countries by a cross-country regression model with panel data and fixed effects.

Moudatsou (2003) provided an empirical assessment of the impact on growth of FDI in the countries of the European Union in the period 1980-1996 and found that the FDI had direct and indirect positive effect on the growth rate of the EU economy (by stimulating trade).

Susic et al. (2017) examined the case of Bosnia and Herzegovina from the perspective of macroeconomic indicators. Using statistical and quantitative analysis, they showed that the influx of foreign capital had a positive effect on the economic development of Bosnia and Herzegovina.

Trojette (2016) explored the impact of foreign direct investment and institutional quality on economic growth in five regions (SSA, MENA, Europe, Asia and America). The author used GMM system covering the period from 1984-2013. The results indicated that the quality of institutions was significant for all regions except for America and above a certain threshold of institutional quality FDI encouraged GDP growth.

The above investigations can be classified according to their conclusions and recommendations reached by the authors. The studies that found a positive link between FDI and economic growth are Hlavacek and Bal-Domanska (2016), Trojette (2016), Moudatsou (2003), Apostolov (2016), Melnyk et al. (2014) and Stojanovic-Trivanovic and Susic (2017). No research ascertained a negative relationship between FDI and economic growth. Only Miernik (2016) concluded that FDI had no significant influence on economic growth.

The objective of this article is to study the impact of FDI on the economic growth of NMS-10 (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia, Bulgaria and Romania) via a vector autoregression (VAR) of annual data for the period 2007-2019. The objective of the article has been achieved by the fulfillment of the following tasks:

- Analyze macroeconomic trends and policies in NMS-10 (Section 1);
- Empirically investigate the effects of FDI on the economic growth of NMS-10 (Section 2);
- Formulate advisable macroeconomic policies for stimulating economic growth in the NMS-10 (Conclusion section).

Croatia has been excluded from the analysis since it accessed the EU relatively rate (in 2013) in comparison with NMS-10, which joined the EU in 2007 and 2010.

2. MACROECONOMIC TRENDS AND POLICIES IN NMS-10

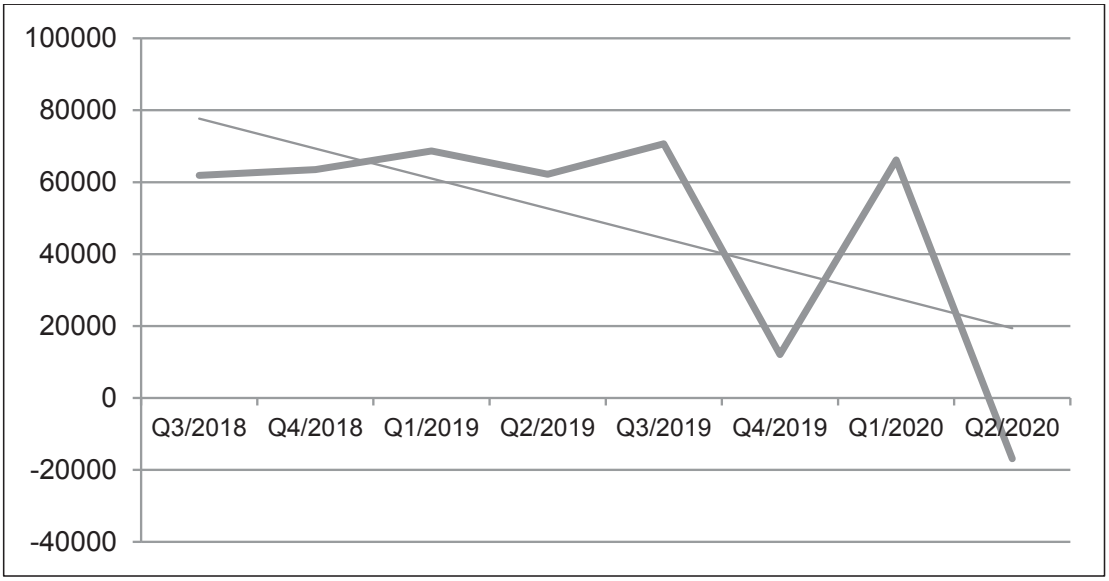
Even before the health pandemic, the world economy had entered a downward trajectory of the economic cycle, which is synthesized with the health pandemic, and this synthesis has deepened the negative effects on the economies of Central and Eastern Europe. The current dynamics of FDI and GDP is crucial for the outcome of the economic consequences of COVID-19.

2.1. Czech Republic

The dynamics of Foreign Direct Investment (FDI) in the Czech Republic for the last two quarters of 2018 is characterized by sustainability and an upward trend. In the first, second and third quarters of 2019 the upward dynamics of FDI, which are realized in the Czech Republic, is preserved, and in the third quarter the largest value of FDI is registered. The trend of FDI dynamics in the fourth quarter of 2019 dramatically changes the direction of movement from an upward to a downward trajectory. This sharp change is the first negative shock to FDI dynamics following the advent of COVID-19 in China. In the first quarter of 2020, there was a sharp increase in FDI in the Czech Republic, due to the initial general reassurance that the viral infection that broke out in China would not spread. This general reassurance preserves investment attitudes and climate. At the end of the first quarter of May 2020, the first case of a Czech citizen infected with coronavirus was reported in the Czech Republic. These events coincide with the pandemic spread of COVID-19 worldwide. Investment attitudes and climate are deteriorating sharply as a result of the declared state of emergency in the Czech Republic and this affects the inflow of FDI as the trend of their dynamics again reverses sharply from upward to downward and this trend continues and deepens in view of the negative values. This negative trajectory of FDI movement will be preserved and will become sustainable.

Figure 1:

DYNAMICS OF INFLOWS OF FDI IN THE CZECH REPUBLIC, MILLIONS OF NATIONAL CURRENCY



Source: Czech National Bank (CNB)

The trend of development of GDP dynamics in the period third quarter of 2018 to the second quarter of 2020 is characterized by a downward trend. In the first two quarters of 2018, a decline in GDP was reported, which continued in 2019 and deepened in the first and second quarters of 2020. The negative trend in the dynamics of the Czech Republic's GDP is gaining a sustainable character, which is likely to continue until the end of 2020 and the beginning of 2021. The main reason for this development of the dynamics of the GDP of the Czech Republic is the pandemic COVID-19. The decline in GDP on a quarterly basis in the first and second quarters of 2020, compared to the first and second quarters of 2019 is significant and progressive.

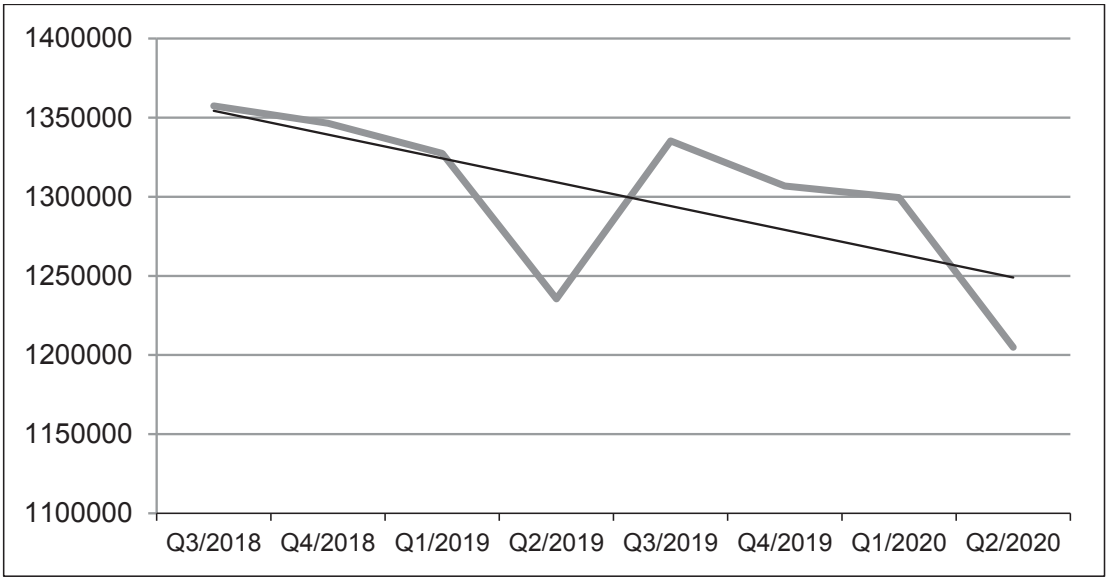
In these conditions of health and economic crisis, the Czech government is pursuing a macroeconomic policy aimed at stimulating income, employment and economic growth, as well as business. Macroeconomic policy includes fiscal and monetary measures. Fiscal measures that include macroeconomic policy are to cover 80 percent of workers' wages if they are quarantined and 60 percent of wages if workers are not quarantined, reducing VAT from 15 percent to 10 percent for sports, tourism and cultural services, a one-time promise for retirees, as well as the possibility of loans for businesses and the self-employed. Also, 50 percent of the value of business rents is covered by the state. It should be noted here that the Czech government fixes the market rental prices for the pandemic period by reducing them by 30 percent and covers 50 percent of the rental price from the reduced rental price, which means that in reality 80 percent of the rental price is taken over by the state. In the area of taxation, tax relief was introduced on the payments of personal income tax and corporate profits, extending the term for their payment.

The monetary measures that have been taken are a reduction in the key interest rate, a reduction in interest rates on loans (IMF, 2020).

The Czech macroeconomic policy is based on a predominantly fiscal discretionary expansionist policy, which is reflected in a financial fiscal package of 9.4 billion Euros.

Figure 2:

DYNAMICS OF GDP IN THE CZECH REPUBLIC, MILLIONS OF NATIONAL CURRENCY



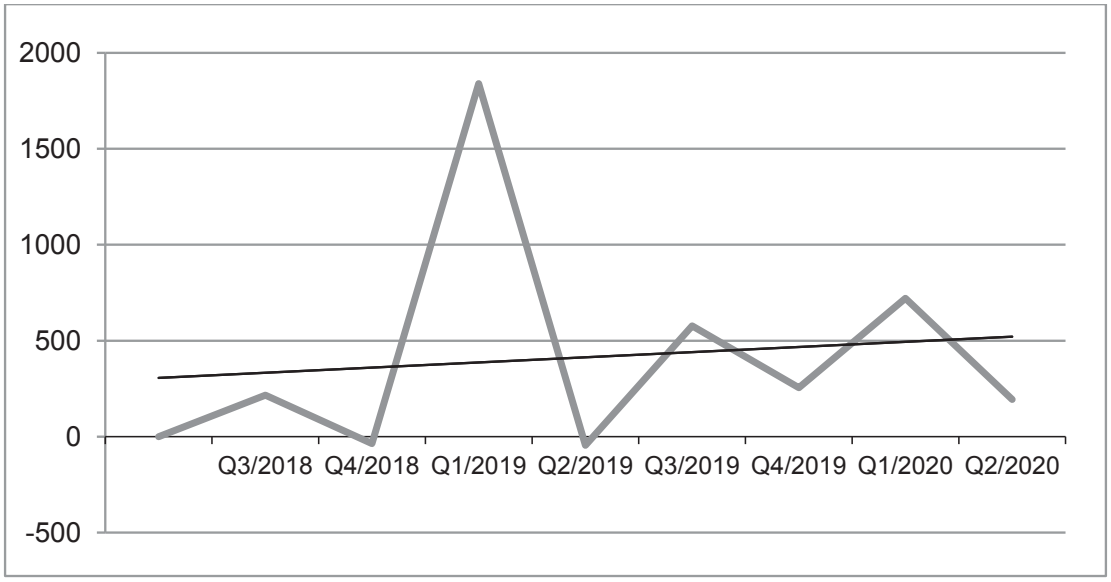
Source: CZSO Czech Statistical Office

2.2. Estonia

Estonia is a country that has not traditionally been an economic area that attracts investors. Therefore, it is not surprising that in the period 2018-2020 FDI predominantly registered low values.

Figure 3:

DYNAMICS OF INFLOWS OF FDI IN ESTONIA, MILLIONS OF EUROS



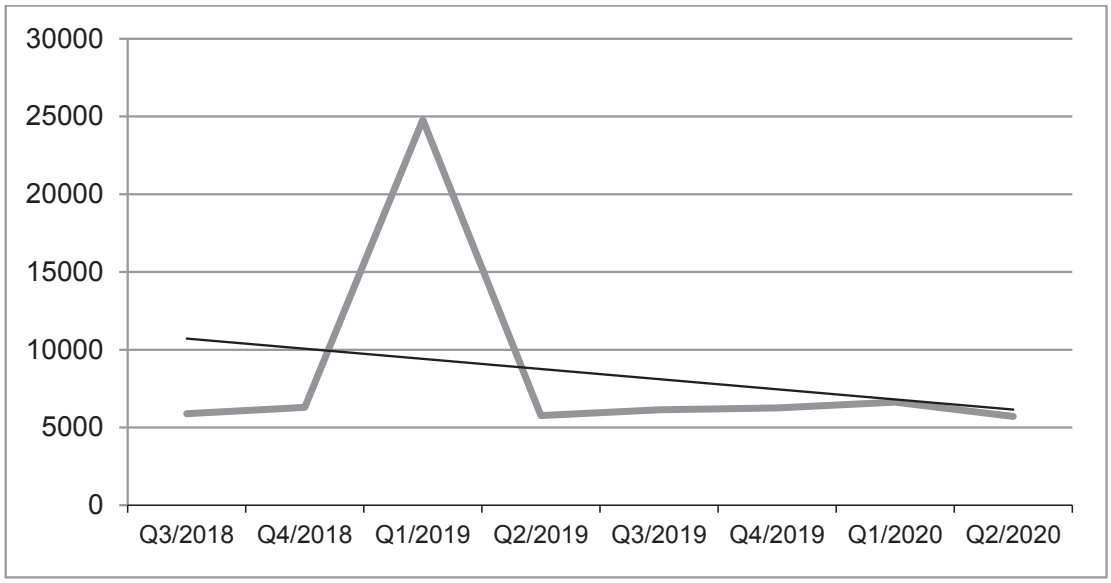
Source: Bank of Estonia

The trend of the dynamics of FDI entering Estonia is predominantly stable in its trajectory, which justifies the conclusion that the inflow of FDI investment in the Estonian economy remains low. The low inflow of FDI remains in 2020. It is clear that the global pandemic is affecting the inflow of FDI and will affect their size in 2021.

The downward trend in Estonia's GDP is characterized by a downward direction.

Figure 4:

DYNAMICS OF GDP IN ESTONIA, MILLIONS OF EUROS



Source: Statistics Estonia

It is obvious that the Estonian economy is registering a slowdown, which is moving in a negative trajectory of the economic cycle. This negative development of economic dynamics has a markedly stable trend, which in the second quarter of 2020 fell sharply compared to the second quarter of 2019. This factual development indicates that economic development in Estonia will slow down throughout 2020.

The coronavirus pandemic further exacerbates the negative trends in the development of FDI and Estonia's GDP. Estonia was affected by the COVID-19 pandemic in February 2020, which means that almost a month earlier than the Czech Republic. Thus, the synchrony of the health and economic crisis has a strong negative impact on the Estonian economy.

The macroeconomic measures that Estonia is taking to combat the economic and health crisis are aimed at controlling unemployment and supporting the health system. The specific fiscal measures that are being taken take the form of a 2 billion-euro fiscal package aimed at increasing the unemployment fund, as well as increasing the health fund and lending to businesses. A special item in the fiscal package is set aside to support local authorities. Monetary measures are expressed in reducing the systemic risk buffer of commercial banks. An interesting monetary

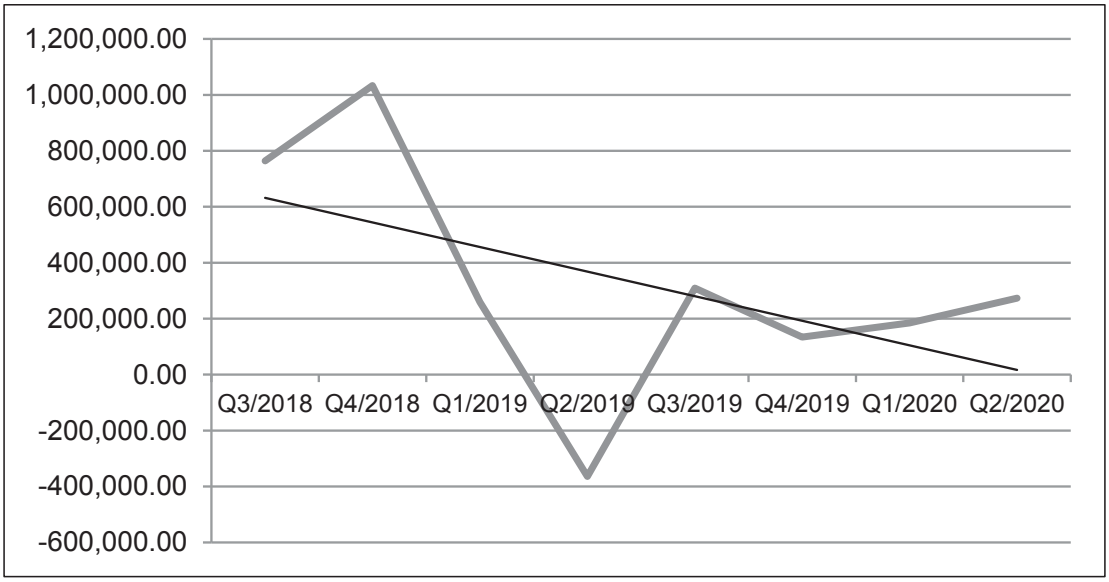
measure is the decision of the Central Bank to support the government budget by distributing its profits (IMF, 2020).

2.3. Hungary

The trend of dynamics of FDI entering Hungary for the period third quarter of 2018 to the second quarter of 2020 is characterized by a negative trajectory.

Figure 5:

DYNAMICS OF INFLOWS OF FDI IN HUNGARY, MILLIONS OF NATIONAL CURRENCY

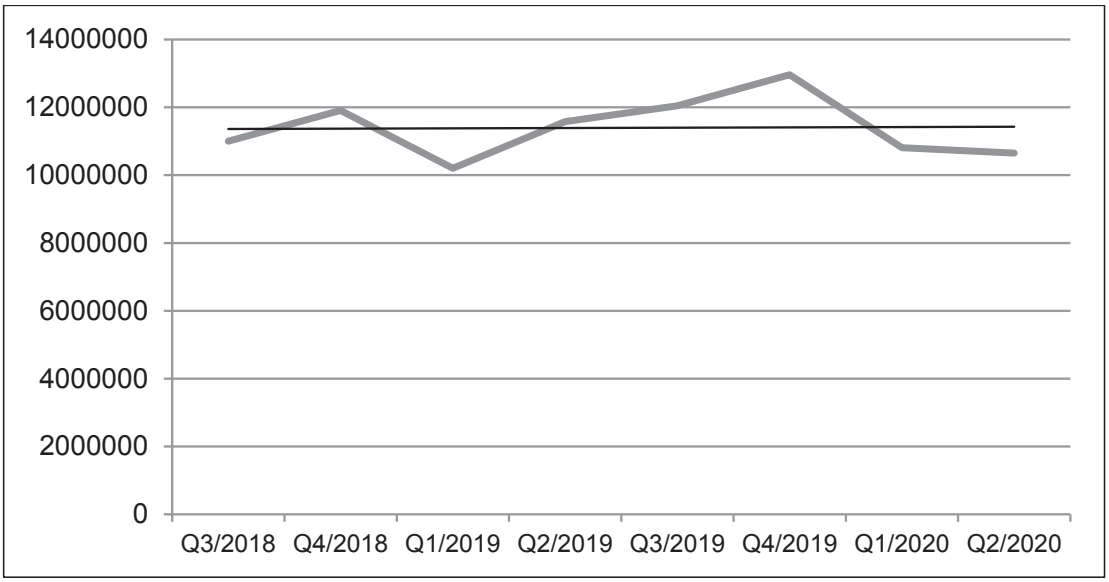


Source: Central Bank of Hungary - MNB

The development of FDI inflows into the Hungarian economy in the first half of 2020 is interesting. As can be seen from the chart, the investor interest and the investment climate report positive trends, which are registered by the dynamics of FDI in the first and second quarters of 2020. Even more interesting is the fact that the second quarter of 2020 registered a higher inflow of FDI compared to the second quarter of 2019.

Figure 6:

DYNAMICS OF GDP IN HUNGARY, MILLIONS OF NATIONAL CURRENCY



Source: Hungarian Central Statistical Office

The trend of development of the dynamics of the GDP of Hungary is maintained in a stable trajectory of development as the first quarter of 2020 registered higher values compared to the first quarter of 2019. In the second quarter of 2020 the positive trend is reversed and GDP registers lower values than in the second quarter of 2019. However, the positive trends in the dynamics of the Hungarian economy are clear.

Hungary registered positive trends in both FDI and GDP in the two quarters of 2020. This positive trend is due to the comprehensive macroeconomic policy pursued by the Hungarian authorities. The first macroeconomic measure that has been implemented is related to fiscal incentives for business, which are concluded in the following specific fiscal instruments - tax and social security benefits for business. Social security and health insurance contributions were frozen, as well as a tax holiday for businesses and the media.

An important fiscal measure introduced by the Hungarian authorities is full subsidy of the salaries of employees in the companies. Hungarian international companies operating in international markets are financially stimulated by the government. The fiscal macroeconomic package includes a special measure that

fully and completely subsidizes newly hired workers, who must work for at least nine months (IMF, 2020).

The Central Bank of Hungary has increased liquidity in the economy by increasing swap operations and freezing penalties from commercial banks that do not maintain the statutory amount of reserves. It also reduced interest rates on deposits and the base interest rate. An important tool that the Hungarian Central Bank has put into operation in the fight against the economic crisis created by COVID-19 is the quantitative easing, which is expressed in the purchase of government securities by the Hungarian government. The mechanisms through which the Central Bank influences the economy are quantitative easing, manipulation of interest rates on deposits, through which manipulation targets inflation and currency exchange against liquidity (IMF, 2020).

Hungary's monetary policy has introduced special macroprudential measures to limit the risk of shifting negative trends from the financial to the real sector of the economy and to guarantee lending to the real economy. Macroprudential measures are a reduction in the foreign exchange coverage ratio, the abolition of the additional capital buffer and the abolition of the minimum reserve requirements (IMF, 2020).

The macroeconomic measures taken by Hungary are very extensive, which is also the factor through which the Hungarian economy, despite the global crisis covid-19 manages to keep its investment climate attractive to investors.

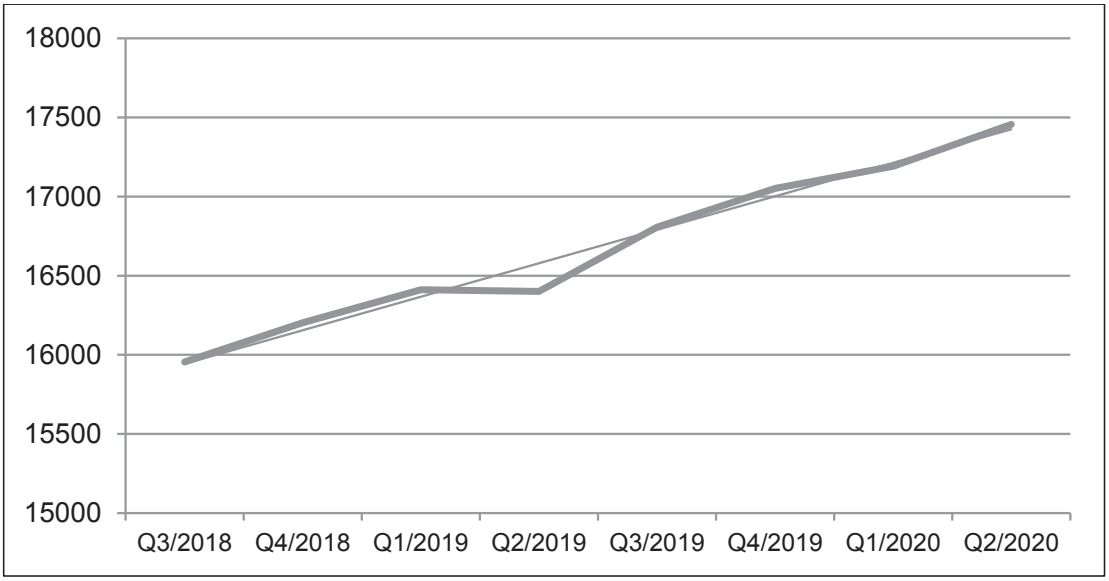
2.4. Latvia

The Latvian economy registered an inflow of FDI, which increased in the first and second quarters of 2020 in the context of economic crisis and health pandemic. The trend of the dynamics is steadily upward, which is a proof that the investor interest and the investment climate in the country have been preserved. The question remains whether this positive trend will continue until the end of 2020.

FDI increased throughout the period, which does not correspond to the dynamics of GDP. The trend of the dynamics of Latvia's economic development is downward. Therefore, the negative shock of the crisis is accumulated by the real economy, which suffers the main crisis effect, and FDI does not affect the negative trends in the real economy.

Figure 7:

DYNAMICS OF INFLOWS OF FDI IN LATVIA, MILLIONS OF EUROS

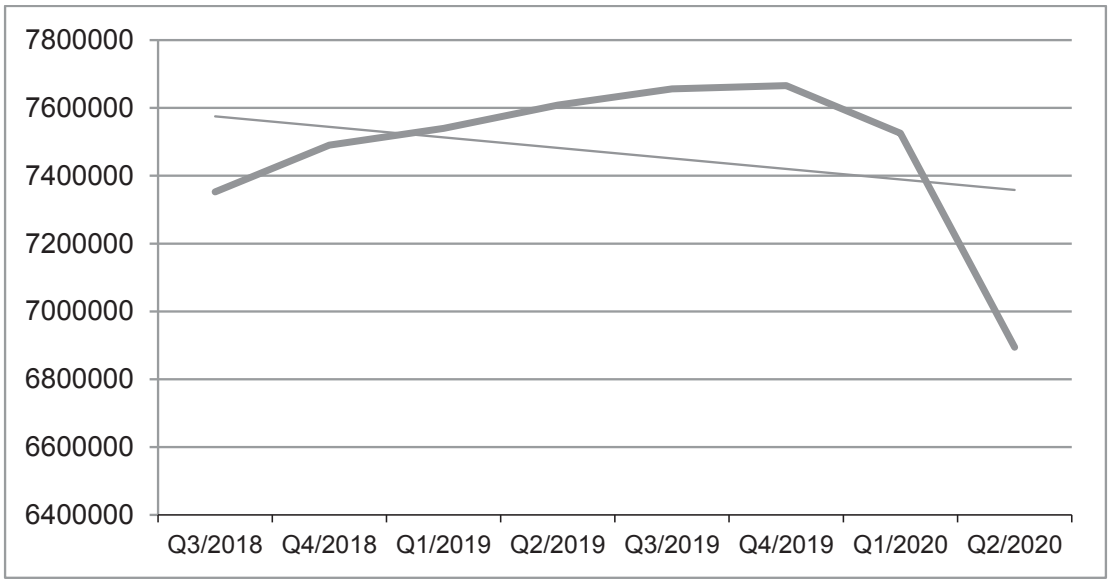


Source: Bank of Latvia

Latvia's economic development has been affected by covid-19 and the recession the world was entering in 2019. This negative trend of GDP development is likely to continue until the end of 2020 and the beginning of 2021.

Figure 8:

DYNAMICS OF GDP IN LATVIA, MILLIONS OF EUROS



Source: Central Statistical Bureau of Latvia

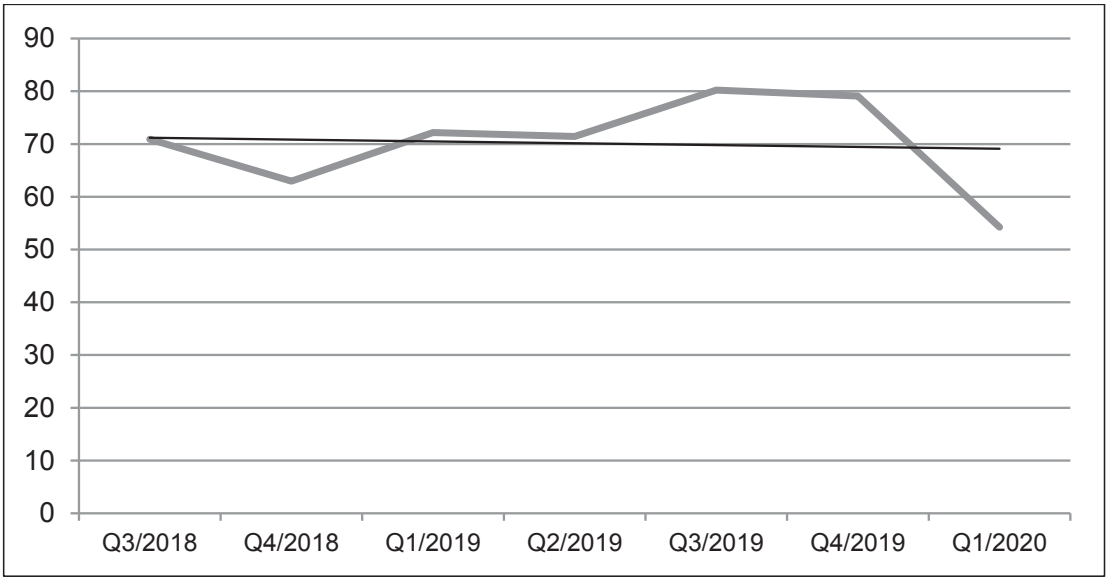
The decline in GDP in the first and second quarters of 2020, compared to the same period in 2019 is drastically large. The management of the economic downturn is realized through the following macroeconomic policy. Namely, through a fiscal package, which aims to stimulate business related to air transport and tourism, i.e. the most affected economic sectors. The main instrument in Latvia's macroeconomic policy is borrowing and issuing Eurobonds. Targeted spending policy aims to stimulate healthcare, education and infrastructure projects to revitalize the economy. Monetary measures reduce interest rates for businesses in the tourism sector and increase the capital of the Institute for Financial Development (IMF, 2020).

2.5. Lithuania

Foreign direct investment entering Lithuania by the fourth quarter of 2019 is increasing. The upward trend in the dynamics of FDI entering Latvia in the first quarter of 2020 registered a sharp and large decline, which has the conditions to continue until 2020, even if it continues in the first half of 2021.

Figure 9:

DYNAMICS OF INFLOWS OF FDI IN LITHUANIA, MILLIONS OF EUROS



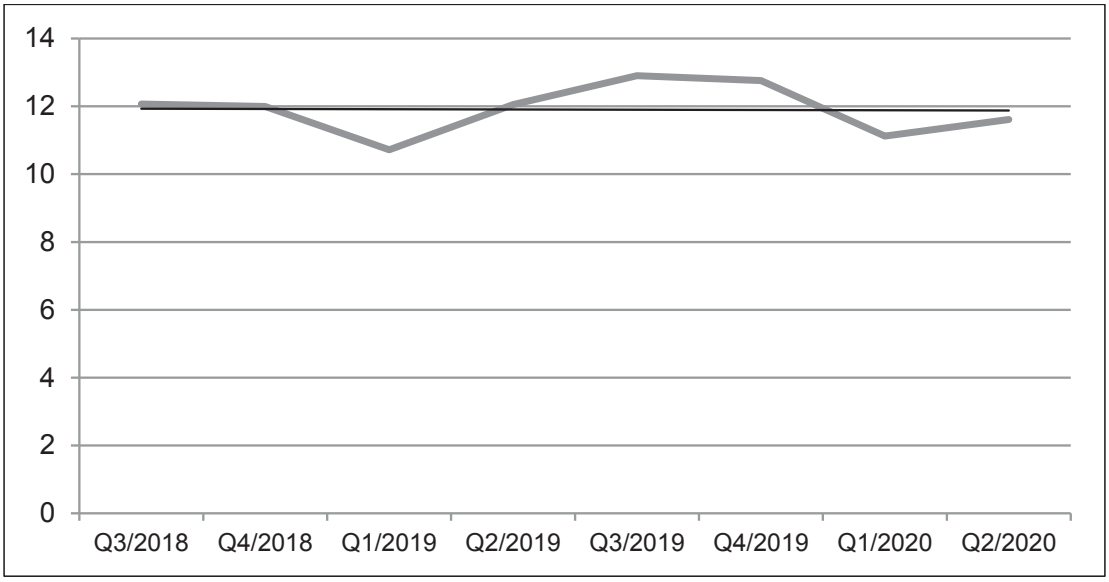
Source: Bank of Lithuania

The dynamics of GDP is characterized by an ascending pace of development to the fourth quarter of 2019, as in the fourth quarter the trend of the trend of the dynamics of GDP of Lithuania is reversed in the fourth quarter of 2019 and the first quarter of 2020. In the second quarter of 2020, however, the trend of GDP dynamics again took an upward direction.

The negative shock of the coronavirus pandemic affects both Lithuania's GDP and FDI inflows. These negative effects are managed with the following macroeconomic program. The Lithuanian government has increased social spending by providing additional funds for the disabled, the sick, the self-employed and parents who have children attending school. The health costs of combating COVID-19 have also increased. The costs of climate change also increased, as well as loans to small and medium-sized enterprises operating in the field of agriculture. A fund with a capital of one billion Euros has been set up to support the business. Deferral of loans and wage subsidies, as well as targeted investments in human capital, digital economy and business, innovation and research, infrastructure and climate change and energy (IMF, 2020) are other measures taken by the Lithuanian government. In the area of monetary instruments, Lithuania has undertaken to reduce the countercyclical capital boom (IMF, 2020).

Figure 10:

DYNAMICS OF GDP IN LITHUANIA, MILLIONS OF EUROS



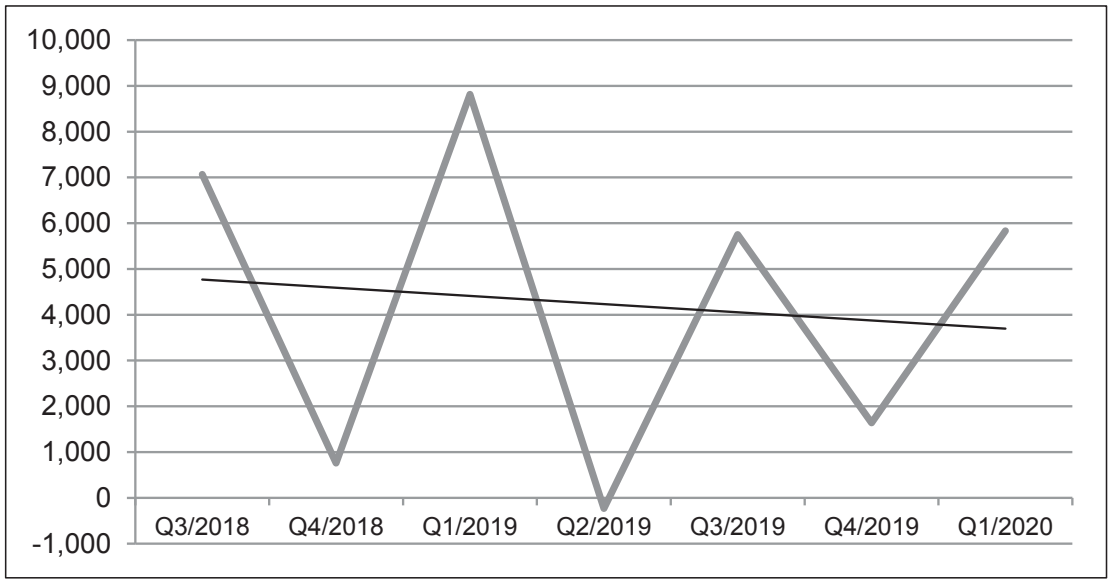
Source: Statistics Lithuania - Official statistical portals

2.6. Poland

The Polish economy managed to maintain a good and attractive investment climate in the first quarter of 2020, which induced an increase in FDI compared to the fourth quarter of 2019, but a decline in FDI in the first quarter of 2020. , compared to the first quarter of 2019. Also, as can be seen, the dynamics of FDI entering Poland is very variable, although the trend is stable in a downward trajectory. This volatility of FDI dynamics in Poland is likely to continue until the end of 2020 and will continue in 2021, but the trend of FDI dynamics will be predominantly downward. The extrapolation of the negative movement of the trend of the dynamics of FDI entering Poland is argued by the ongoing global health crisis, which at the end of 2020 will grow into an acute economic crisis, which, although taking place since March 2020. The decline in FDI at the end of 2020 can be justified by the inevitable deterioration of the Polish investment climate, which is heralded by the general contraction of economic growth in Poland, which was registered in the first quarter of 2020 and continues in the second quarter of 2020.

Figure 11:

DYNAMICS OF INFLOWS OF FDI IN POLAND,
MILLIONS OF NATIONAL CURRENCY

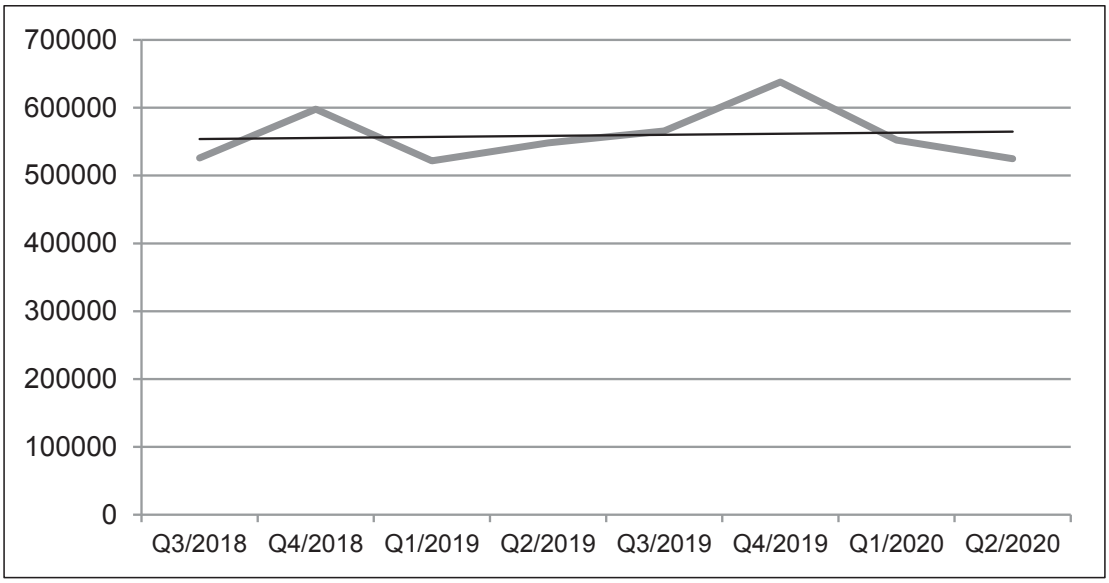


Source: Narodowy Bank Polski - Internet Information Service - NBP

The sustainable negative development of the dynamics of Poland's GDP in 2020 is clearly emphasized in the second quarter, which confirms the trend of ongoing crisis processes in the Polish economy.

Figure 12:

DYNAMICS OF GDP IN POLAND, MILLIONS OF NATIONAL CURRENCY



Source: Narodowy Bank Polski - Internet Information Service - NBP

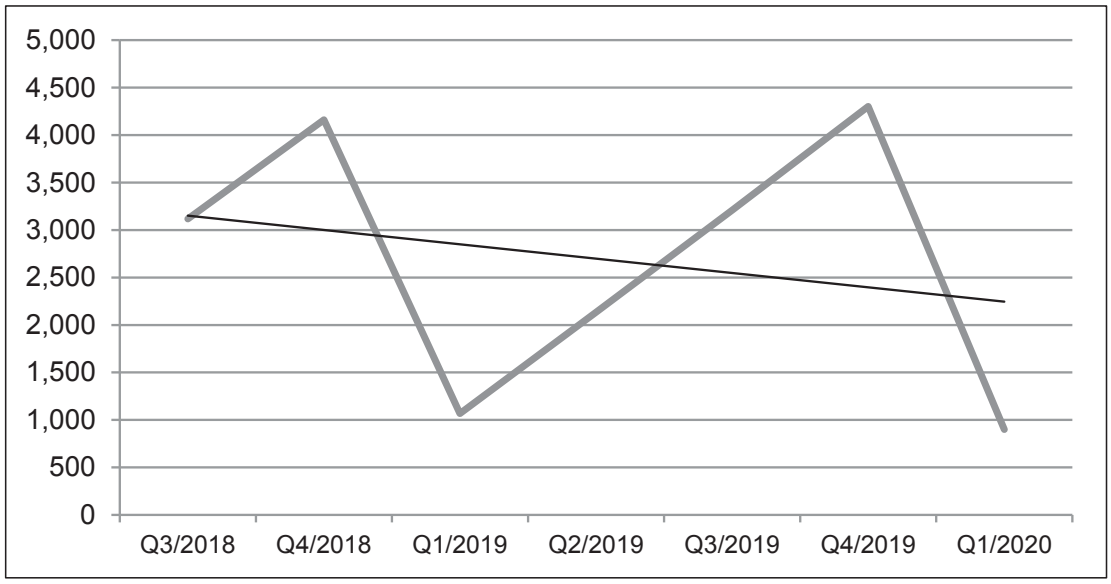
The negative trend of GDP development is likely to continue in 2021. By the end of 2020, this negative trend of GDP will deepen and will continue in the first months of 2021. The measures taken by the Polish authorities to limit the development of negative trends in the economy are the following: credit guarantees for microcredit, subsidies for salaries of medical staff and equipment, as well as subsidies for social security contributions, as well as the abolition of social security contributions for micro-firms, tax deferral, tourism support, interest rate subsidies for bank loans, as well as financial assistance to municipalities, reduction of interest rates and reduction of the systemic risk buffer (IMF, 2020).

2.7. Slovakia

Foreign direct investment in Slovakia registered a permanent decline, as negative trends intensified, especially in the first half of 2020. The downward trend in FDI dynamics will continue until the end of 2020, and most likely this trend will continue in 2021.

Figure 13:

DYNAMICS OF INFLOWS OF FDI IN SLOVAKIA, MILLIONS OF EUROS

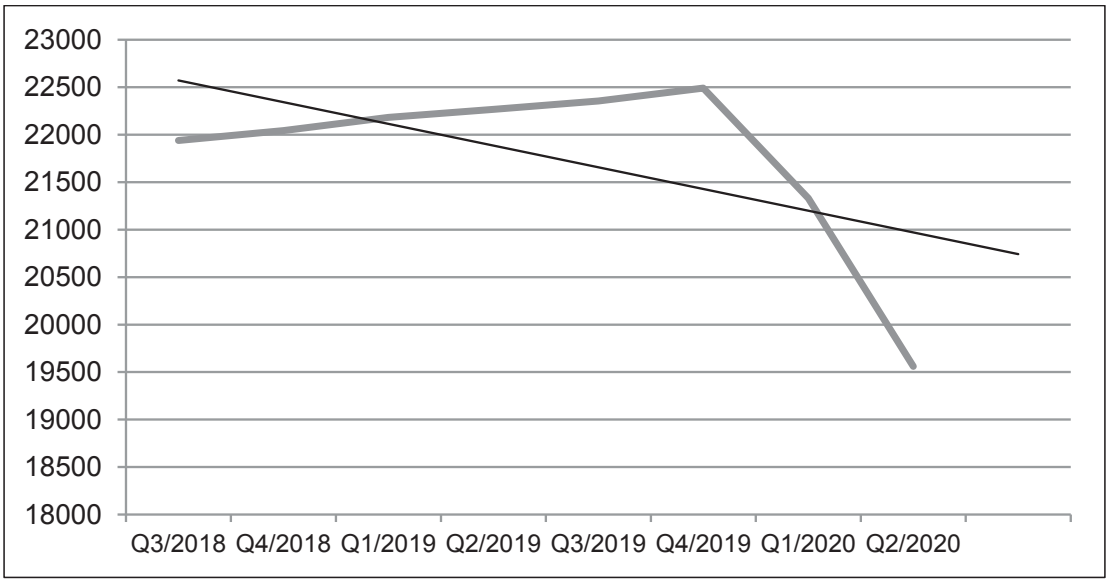


Source: National bank of Slovakia

The Slovak economy registered a sharp decline in GDP. It is likely that this negative development of Slovakia's GDP will continue until the end of 2020. The policy of the Slovak authorities in the pandemic conditions is to cover the salaries of the affected enterprises and the self-employed, increase unemployment benefits, tax and social security benefits, rental subsidies and higher health costs. Banks can also operate with that part of capital that is not included in tier 1 capital adequacy (IMF, 2020).

Figure 14:

DYNAMICS OF GDP IN SLOVAKIA,
MILLIONS OF EUROS



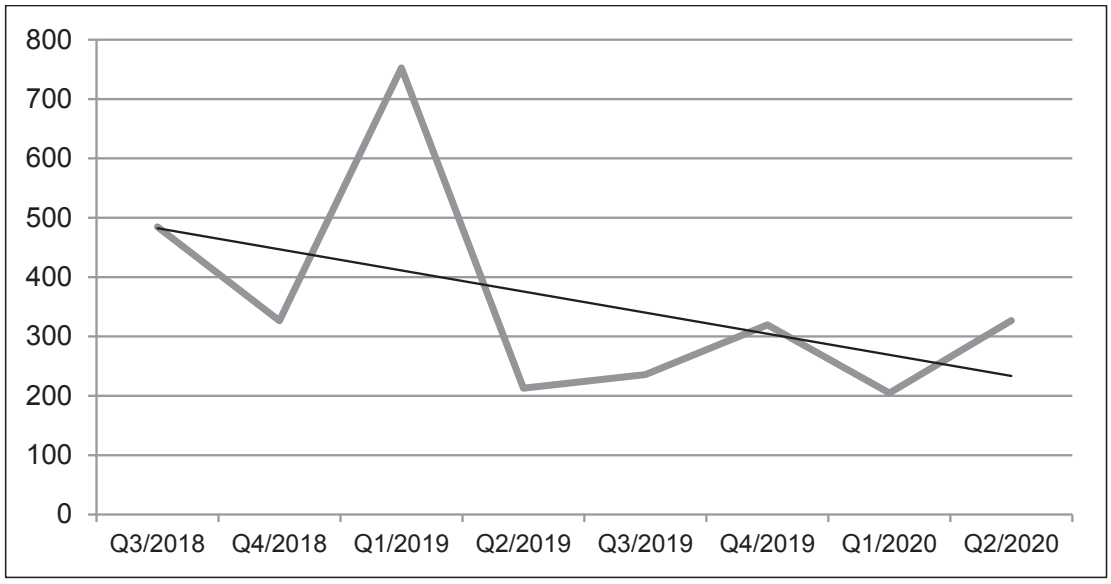
Source: National bank of Slovakia

2.8. Slovenia

Foreign direct investment in Slovenia from the third quarter of 2018 to the second quarter of 2020 was characterized by a negative trend and dynamics. The main decline in FDI was in the period from the second quarter of 2019 to the first quarter of 2020, and it was in the first quarter of 2020 when the drop in FDI was the largest.

Figure 15:

DYNAMICS OF INFLOWS OF FDI IN SLOVENIA,
MILLIONS OF EUROS

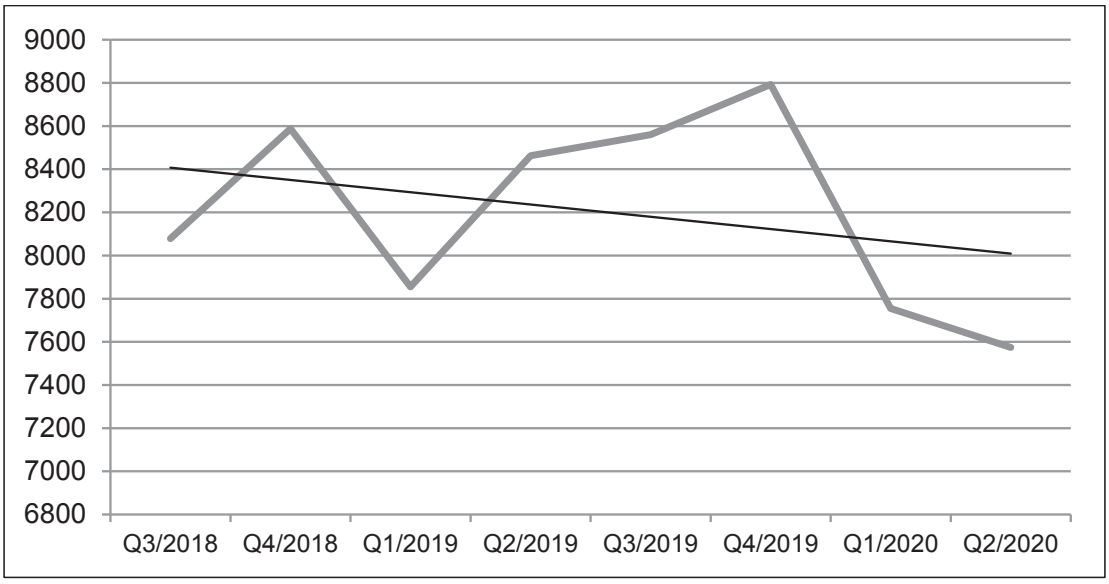


Source: Bank of Slovenia

In the second quarter of 2020, the negative trend of FDI entering Slovenia was reversed.

Figure 16:

DYNAMICS OF GDP IN SLOVENIA,
MILLIONS OF EUROS



Source: Statistical Office of the Republic of Slovenia - SURS

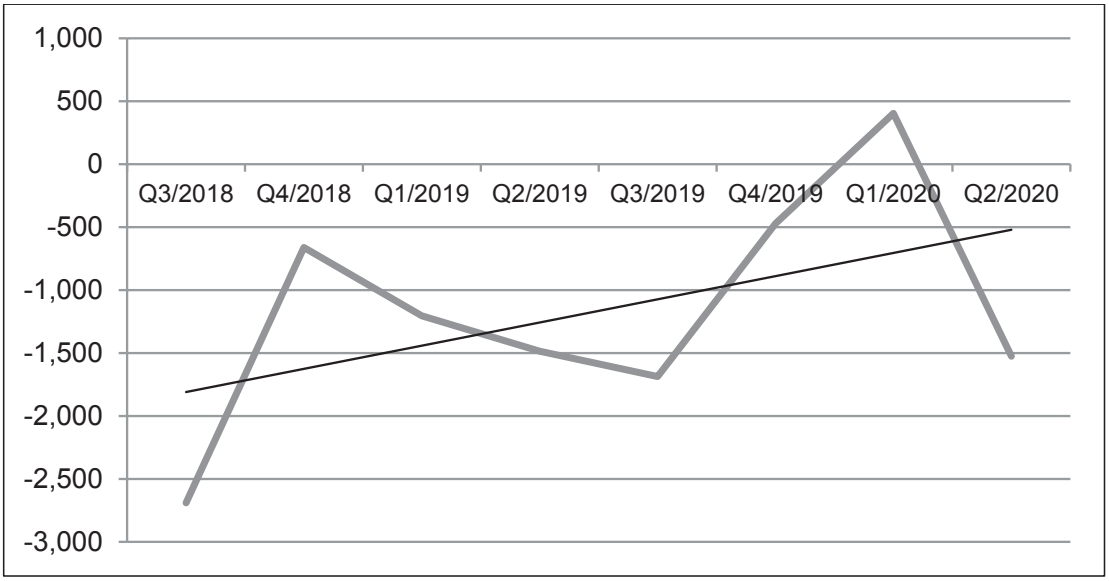
Slovenia's economic growth contracted during the period under review, with the negative trend particularly deepening in the first half of 2020. The negative trajectory of GDP will probably continue until the end of 2020, as well as in the first quarter of 2021. The countercyclical macroeconomic policies applied by the Slovenian authorities to minimize the damage from the negative trends of FDI and GDP are tax holidays, wage subsidies, monthly income for households, pensioners, students and kindergartens, subsidies for health workers, vouchers for tourist holidays, as well as loan opportunities. A deferral was also introduced for the payment of the due cash installments on loans, as well as a reduction of the bank fees, as the reduction of the bank fees is in accordance with the income and opportunities of the consumers, i.e. bank fees have been reduced on a progressive basis (IMF, 2020).

2.9. Romania

Romanian foreign direct investment has been negative throughout the period, with a sharp decline in the first half of 2020, which will continue in 2021. It is clear that the Romanian economy is not attractive to international investors. The negative trends in FDI entering Romania are not only due to the COVID-19 crisis, but also to negative processes in the economy, which are a consequence of the crisis in which the world fell and without the health pandemic.

Figure 17:

DYNAMICS OF INFLOWS OF FDI IN ROMANIA,
MILLIONS OF NATIONAL CURRENCY



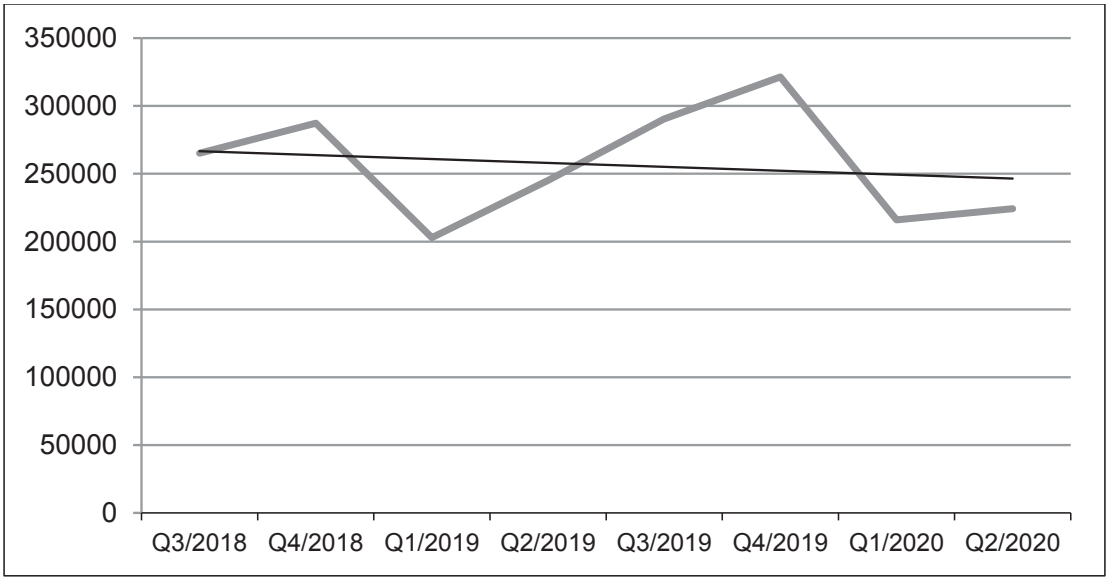
Source: National Bank of Romania

Romania's economic development is characterized by high volatility, which in the first and second quarters of 2020 shifts into a trajectory of negative dynamics, which is likely to maintain this trend until 2020 and early 2021. The macroeconomic countercyclical policy pursued by the Romanian authorities in order to control the negative economic consequences is to increase the costs of conservation, to cover part of the salaries of parents whose children do not attend school and kindergarten, as well as to cover part of the salary of private sector workers,

tax holidays and stimulating small and medium-sized businesses through loans. The CB also reduced interest rates and provided liquidity through repo operations, secondary market CCP operations and ensuring the smooth operation of settlement systems (IMF, 2020).

Figure 18:

DYNAMICS OF GDP IN ROMANIA,
MILLIONS OF NATIONAL CURRENCY



Source: National Institute of Statistics - ROMANIA

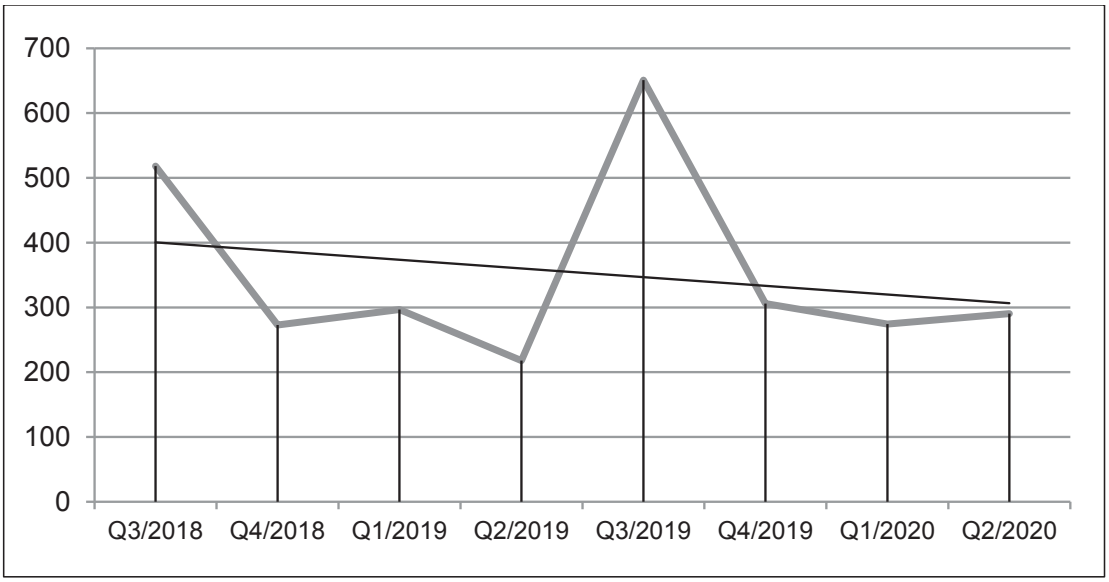
2.10. Bulgaria

The incoming FDI in Bulgaria for the considered period are characterized by low values, the trend of development of the dynamics has a downward trajectory. The trend in the first quarter of 2020, compared to the first quarter of 2019 of incoming FDI is negative, foreign direct investment is declining. In the second quarter of 2020 there is a slight increase in FDI entering Bulgaria compared to the second quarter of 2019. In the first quarter of 2020 there was a decrease in FDI compared to the previous quarter of 2019, which is due to the pandemic of coronavirus infection. Most likely, the FDI values will remain low until the end of 2020,

and this trend will continue in 2021. The reasons for the negative trends regarding the size of FDI are the pandemic of COVID-19, the political instability and the inefficient judicial system, as well as the great corruption in Bulgaria.

Figure 19:

DYNAMICS OF INFLOWS OF FDI IN BULGARIA,
MILLIONS OF NATIONAL CURRENCY



Source: Bulgarian National Bank

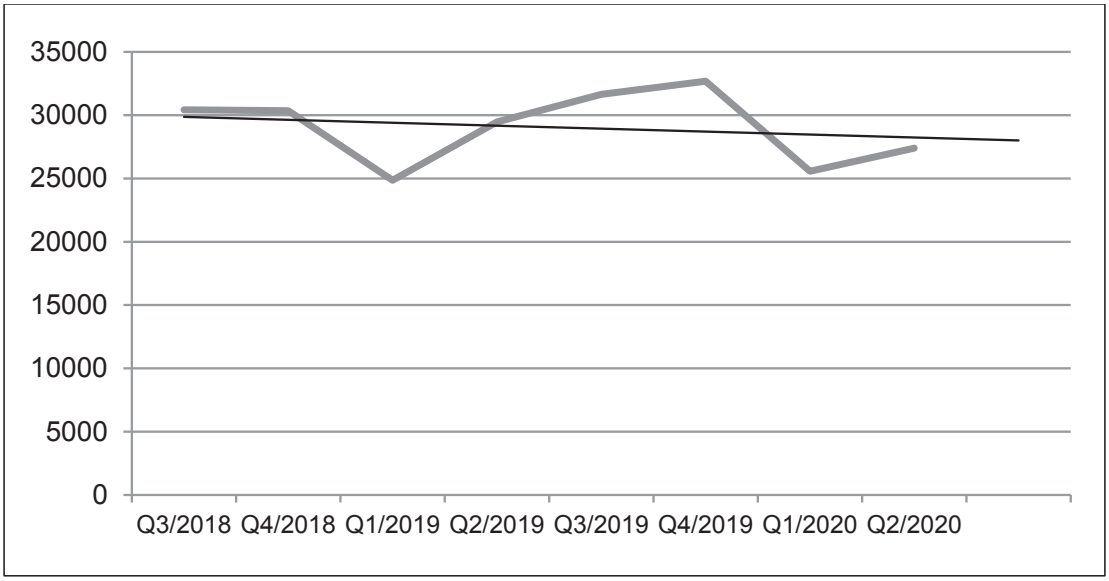
The trend of GDP development for the period third quarter 2018 to the second quarter 2020 is negative. Bulgaria's economy is shrinking. In the first and second quarters of 2020, the negative development trends persist, which will most likely be transferred in 2021.

In these conditions of health, political and economic crisis, the Bulgarian authorities are building their macroeconomic policy with the following measures. Fiscal measures include covering 60 percent of the wages and social security contributions of workers employed in enterprises, tax deferral of corporate tax payments, increasing health and defense spending, increasing support costs for the self-employed, such as artists, creators and etc., reduction of VAT on tourist services, books and baby food and gyms, support for enterprises, subsidies for the minimum wage, subsidies of BGN 290 for each reserved job in the tourism sector,

supplement to the pensions of BGN 50 ., on-site subsidy of air transport with 35 Euros, promotion of FDI, tourist waltzes for Bulgarian resorts, monthly assistance to families with children up to 14 years of age who have a certain income. Measures were also taken to increase bank liquidity, capitalize on BNB profits, abolish the increase in the countercyclical capital buffer, impose a monitor on bank loan payments, conclude a swap loan with the ECB and increase the capital of the Bulgarian Development Bank, to guarantee bank loans to enterprises. Subsidies for micro-enterprises and urban development expenditure were provided (IMF, 2020).

Figure 20:

DYNAMICS OF GDP IN BULGARIA,
MILLIONS OF NATIONAL CURRENCY



Source: National Statistical Institute of Bulgaria

2.11. Summary of macroeconomic trends and developments in NMS-10

The current trends of the inward FDI of the countries of Central and Eastern Europe are negative; this negative trend is maintained in GDP. The countries implement almost uniform macroeconomic programs, which are predominantly based on fiscal measures, while monetary measures are rather ancillary. The main

differences in the instruments of the countries and their implementation are at the beginning of the viral pandemic and this will be the factor that will determine the faster and more effective exit of the countries from the economic crisis. It can be concluded that FDI is not a factor that determines the GDP of the countries of Central and Eastern Europe.

3. EMPIRICAL ANALYSIS OF THE EFFECTS OF FOREIGN DIRECT INVESTMENTS ON THE ECONOMIC GROWTH OF THE NEW MEMBER STATES

3.1. Methodology

This research employs a vector autoregression (VAR) since this methodology has the following merits: first, it is suitable for time series data, where current values of variables depend on their past values; second, it gives an opportunity to analyze both short-run and long-run causal links between variables; three, the presence of different lags in the model contributes to overcoming the endogeneity problem; four, the response of variables to changes in other factors included in the model, can be visualized.

The VAR models includes the following variables: $\mathbf{GDPGR_{ij}}$ **–** real GDP growth rate of country **i** in year **j**; $\mathbf{FDI_{ij}}$ – flow of foreign direct investment in country **i** in year **j** (percentage of GDP); $\mathbf{Dom\_Inv_{ij}}$ – domestic investment in country **i** in year **j** (percentage share of the difference between gross fixed capital formation and FDI in GDP); $\mathbf{REER_{ij}}$ – real effective exchange rate of country **i** in year **j** (percentage change on the previous year); $\mathbf{FISCB_{ij}}$ – fiscal balance (percentage of GDP) of country **i** in year **j**; $\mathbf{ACT\_POP_{ij}}$ – active population growth rate of country **i** in year **j**; $\mathbf{INFLR_{ij}}$ – inflation rate of country **i** in year **j**; $\mathbf{TRADE_{ij}}$ – trade openness (percentage ratio of exports and imports to GDP) of country **i** in year **j**; $\mathbf{HDI_{ij}}$ – human development index of country **i** in year **j**; $\mathbf{CORRUPT_{ij}}$ – corruption perception index of country **i** in year **j**.

The target (dependent) variable is **GDPGR.** The independent (explanatory) variable of interest to interest to this research is **FDI**. The remaining variables are control variables. They reflect the influence of the following factors on economic growth:

- **Dom_Inv** – internal investment activity;
- **REER –** price (cost) competitiveness of the national economy;
- **FISCB** – fiscal policy of the government;
- **ACT_POP –** labor market developments;
- **INFLR** – monetary policy of the central bank;
- **TRADE** – international economic conditions;
- **HDI –** quality of human capital and living standard;
- **CORRUPT** – institutional environment.

3.2. Data

This study uses annual data on ten NMS - the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia, Bulgaria and Romania, for thirteen years (the period 2007–2019). The number of observations is 130.

The data sources are as follows:

- ✓ The Eurostat website for the variables **GDPGR, FDI, Dom_Inv, REER, FISCB, ACT_POP, INFLR** and **TRADE;**
- ✓ The United Nations (UN) Human Development Reports for the variable **HDI;**
- ✓ The Transparency International website for the variable **CORRUPT.**

3.3. Results

The Levin, Lin & Chu unit root tests show that all variables are stationary at level (see Table 1). This requires the application of unlimited VAR.

Table 1:

LEVIN, LIN & CHU UNIT ROOT TEST*

Variable	Statistic	Probability	Cross-sections	Observations
GDPGR	-9.59444	0.0000	10	90
FDI	-10.7794	0.0000	10	90
Dom_Inv	-7.46367	0.0000	10	90
REER	-10.9169	0.0000	10	90
FISCB	-20.3457	0.0000	10	90
ACT_POP	-6.38607	0.0000	10	90
INFLR	-9.93085	0.0000	10	90
TRADE	-10.2250	0.0000	10	90
HDI	-7.31277	0.0000	10	90
CORRUPT	-2.99060	0.0014	10	90

* Null: Unit root (assumes common unit root process)

Source: Prepared by the authors

The test for the optimal number of lags in the vector autoregression indicates that according to the Schwarz information criterion and the Hannan-Quinn information criterion this number is one (see Table 2). The vector autoregression has been estimated with one lag.

Table 2:

OPTIMAL LAG LENGTH IN THE VAR MODEL

Number of lags	FPE	AIC	SC	HQ
0	1982587.	42.87866	43.19988	43.00625
1	21.34856	31.41349	34.94684*	32.81698*
2	11.76781*	30.65375	37.39923	33.33314
3	17.62563	30.58968	40.54730	34.54497
4	13.06068	29.24032*	42.41008	34.47151

* Shows the optimal number of lags according to the respective criterion

Source: Prepared by the authors

The equation for the target variable in the VAR model **GDPGR** after the step-by-step removal of statistically insignificant variables is

(1) GDPGR = 30.73 + 0.19*GDPGR(-1) - 31.87*HDI(-1) - 1.03*INFLR(-1)

The standard errors, the t-statistics and the probabilities of the regression coefficients in Equation (1) are reported in Table 3.

Table 3:

RESULTS FROM THE ECONOMETRIC ESTIMATION OF EQUATION (1)

Variable	Coefficient	Standard error	t-Statistic	Probability
C	30.72554	8.482772	3.622111	0.0005
GDPGR(-1)	0.190833	0.062291	3.063562	0.0028
HDI(-1)	-31.86836	10.03307	-3.176333	0.0020
INFLR(-1)	-1.032929	0.095998	-10.75990	0.0000

Source: Prepared by the authors

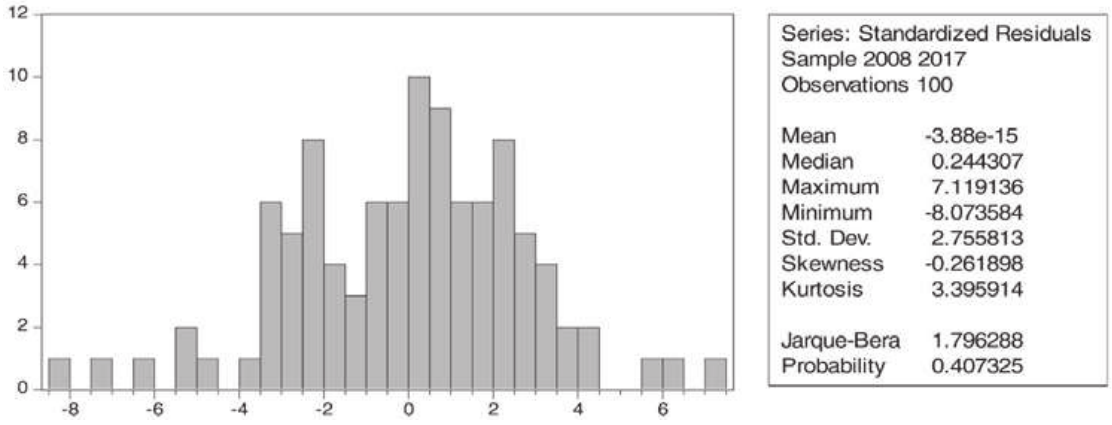
The economic growth in NMS-10 is affected by its own past values and the lagged values of the human development index and the inflation rate. The negative sign of **HDI** (a proxy for human capital) is in conflict with the theory of economic growth. It can be explained by the migration of highly qualified and productive workforce from NMS-10 to wealthier countries, which prevents the NMS-10 from taking full advantage of their human capital.

The value of the coefficient of determination (R-squared = 0.56) indicates that 56% of the variation of the NMS-10 real GDP growth can be explained by changes in the independent variables in Equation (1). The probability of the F-statistic (0,00) shows that the alternative hypothesis of adequacy of the model used is confirmed. It should be made clear that this does not mean that the model is the best possible but simply adequately reflects the relationship between the dependent and the independent variables.

The probability of Jarque-Bera statistics is 0.41 (see Figure 21), which justifies the acceptance of the null hypothesis of normal distribution of the residuals in Equation (1).

Figure 21:

TEST FOR NORMAL DISTRIBUTION OF RESIDUAL IN EQUATION (1)



Source: Prepared by the authors

The results from the Pairwise Granger Causality Tests indicate that in the short term the economic growth of NMS-10 is Granger-caused by the changes in the real effective exchange rate, the active population and the inflation rate (see Table 4).

The results from the Granger Causality / Block Exogeneity Wald Tests show that in the long run the human development index (human capital and living standard) and the inflation rate Granger-cause the real GDP growth rate in NMS-10 (see Table 5).

Table 4:

RESULTS FROM SHORT-TERM CAUSALITY TESTS

Independent variables	Probability
FDI	0.2716
Dom_Inv	0.2737
REER	0.0010
FISCB	0.7106
ACT_POP	0.0771
INFLR	3.E-16
TRADE	0.8555
HDI	0.7670
CORRUPT	0.9628

Source: Prepared by the authors

Table 5:

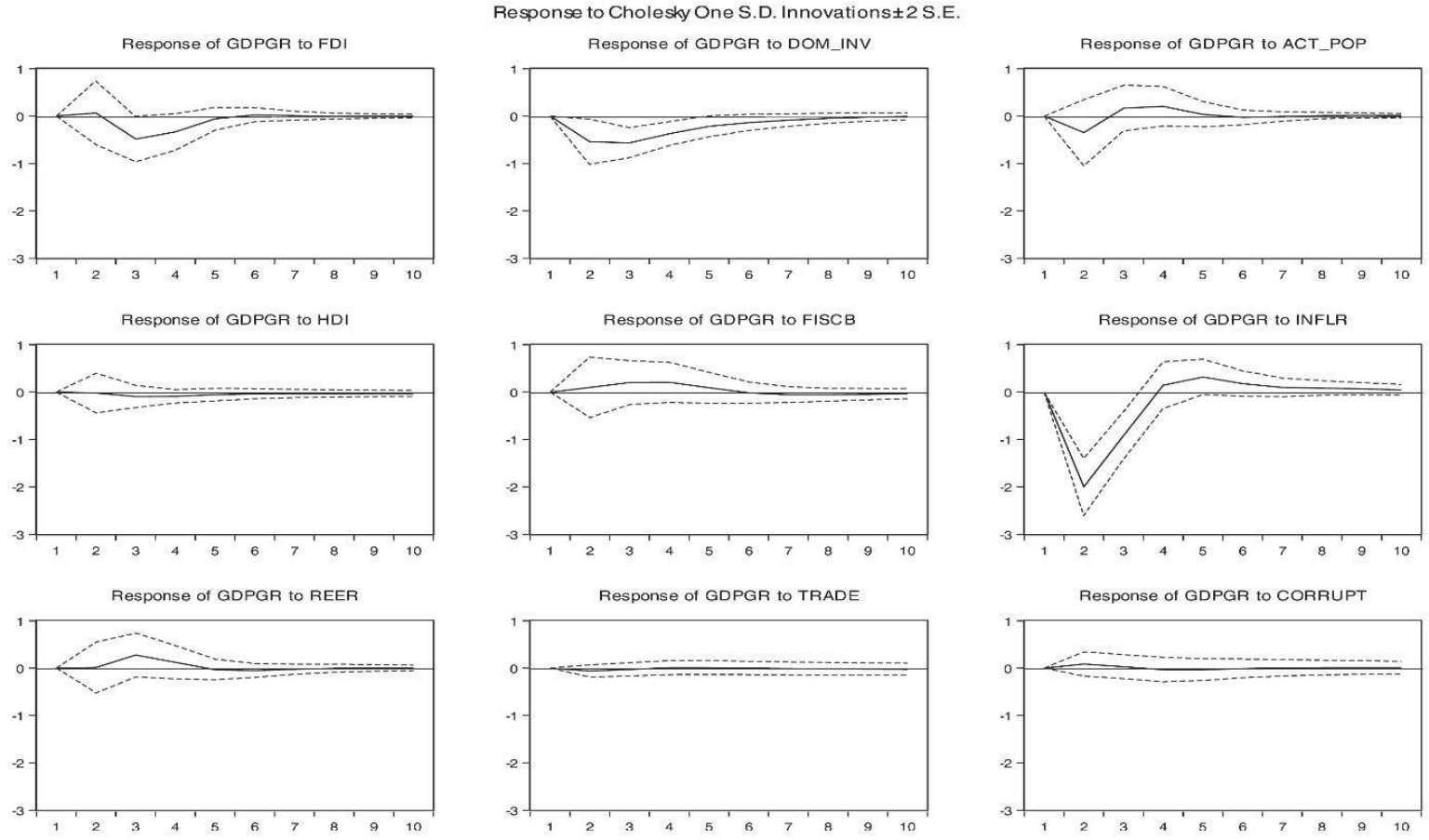
RESULTS FROM LONG-TERM CAUSALITY TESTS

Independent variables	Probability
FDI	0.5573
DOM_INV	0.3864
ACT_POP	0.9567
HDI	0.0492
FISCB	0.5027
INFLR	0.0000
REER	0.9320
TRADE	0.4652
CORRUPT	0.5073

Source: Prepared by the authors

Figure 22:

RESPONSES OF ECONOMIC GROWTH IN NMS-10 TO EXTERNAL SHOCKS



Source: Prepared by the authors

The responses of economic growth in NMS-10 to shocks in the independent variables in Equation (1) **FDI, DOM_INV, ACT_POP, HDI, FISCB, INFLR, REER, TRADE** and **CORRUPT** are displayed in Figure 22.

4. CONCLUSION

The empirical analysis in this paper provides evidence that the growth rate of the real GDP in the NMS-10 in the period 2007-2019 was influenced by the human development index and the rate of inflation but not by FDI. These results can be explained by the substantial drop of FDI flows to NMS-10 after the global financial crisis of 2007-2008, which made internal factors such the quality of human capital and price stability crucial to the economic growth of the new member states from Central and Eastern Europe.

The Granger causality tests show that the economic growth of NMS-10 is caused by the dynamics of the real effective exchange rate, the number of active population and the inflation rate in the short term and by the human development index and the inflation rate in the long term.

It may be inferred that the long-term economic growth of NMS-10 depends on the quality of the human capital and the inflation rate in these countries. It is advisable that policymakers concentrate their efforts on stopping the emigration of young and highly qualified workforce and on stabilizing the internal price level in order to encourage long-run economic growth.

However, in the short run expansive fiscal and monetary policies are needed to overcome the economic crisis caused by the coronavirus.

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UTJECAJ IZRAVNIH STRANIH ULAGANJA NA GOSPODARSKI RAST NOVIH ZEMALJA ČLANICA IZ SREDNJE I ISTOČNE EUROPE

Sažetak

Cilj ovog rada je proučiti učinke izravnih stranih ulaganja (FDI) na gospodarski rast deset novih država članica (NMS) iz srednje i istočne Europe (CEE), koje su pristupile Europskoj uniji (EU) 2004. i 2007. godine. – Češka, Estonija, Mađarska, Latvija, Litva, Poljska, Slovačka, Slovenija, Bugarska i Rumunjska. Hrvatska je isključena iz analize jer je članica EU postala relativno kasno - 2013. godine. Koristi se vektorska autoregresija (VAR) godišnjih podataka za razdoblje 2007.-2019. Empirijski rezultati pokazuju da izravna strana ulaganja ne utječu na stopu rasta realnog BDP-a novih država članica srednje i istočne Europe. Rezultati istraživanja također pokazuju da izravna strana ulaganja po Grangeru ne uzrokuju gospodarski rast novih država članica iz srednje i istočne Europe niti kratkoročno niti dugoročno.

Ključne riječi: nove države članice, ekonomski rast, izravna strana ulaganja, vektorska autoregresija