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An Empirical Analysis of the Impact of Global Financial Crisis on Economic Activity in North Macedonia

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Abstract
Global financial crisis caused major economic disruptions and slow down economic activity in North Macedonian economy. The purpose of this paper is to examine the impact of Global financial crisis on economic activity in North Macedonia through analyzing fluctuations of major macroeconomic indicators of the economy. In this regard, it analyzes the trends of macroeconomic indicators that reflect the development and macroeconomic balances of those economies, such as GDP, unemployment, foreign direct investment, trade openness, and the level of public debt, in order to identify factors that have contributed in their fluctuations. The research methodology consists of regression model of time series, OLS and VECM models. The results suggest that Global financial crisis had a negative impact on the economic growth, because the coefficient has a negative sign and is statistically significant.
Keywords: global financial crisis, economic effects, OLS, VECM
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1.Introduction

The world's biggest economic crisis, although not created in North Macedonia, has its own reflection on the Macedonian economy.

First of all, it is due to the dependence of the small and open Macedonian economy on the demand for products in the member states of the European Union, which has significantly decreased due to the Global financial crisis. The North Macedonian economy as well as her stature were well positioned. Namely, the conservative fiscal, monetary and financial policy gave the North Macedonian authorities room to spillover of the global crises. As a result, North Macedonia avoided a major decline in production and problematic capital outflows.

The country was well positioned to return to growth once the situation in Europe improved[1]

In the period of 2006-2008, the economy grew at an average rate of 5.5% and the growth rate of 6.5% in 2007 is the highest since its independence.

High optimism among economic subjects was followed by a boom in credit activity in conditions of an almost balanced budget.

This trend was interrupted again with the onset of the Global financial and economic crisis, which for this small economy was the first recession. Exports fall drastically, which contributed to the deficit in the current account of the balance of payments reaching 12.7%. International financial institutions not offered almost any support to deal with the crisis in the first few years of its occurrence. The low level of public debt provided considerable fiscal space for simulative anti-crisis measures. International financial markets were completely frozen until from September 2008 until early June 2009 were the Eurobond was issued. National bank of North Macedonia applied a sharp monetary contraction. The reference interest rate in the spring of 2009 reached 9%, credit activity decreased and monetary aggregates M1 and M2, which grew at a high annual rate in the past few years, recorded a decrease of -4.1% and -4.3% respectively.

With a negative growth rate of -0.4% in 2009 we entered a recession. Healing was slow over the next two years. With the repeated decline of the economic activity by 0.5% in 2012 North Macedonia recorded a double recession.

Basically the North Macedonian economy was exposed to the Global financial crisis and recession through two channels, the financial system and foreign trade. The negative effects of the financial channel were limited due to the soundness of the banking sector and the lack of exposure to risky foreign assets.

The negative effects of the financial channel were limited due to the soundness of the banking sector and

[1] http://macedoniaonline.eu/content/view/23138/45/

the lack of exposure to risky foreign assets. However the independent assessment of the IMF and World Bank Financial System Assessment Mission conducted in March and April 2008 stated that North Macedonia's financial system is not particularly vulnerable to macroeconomic and financial shocks. The North Macedonian banking sector which constitutes more than 90% of the financial sector. Finances the credit expansion from its own sources or from its deposits.

Unlike Bulgaria, Serbia, Croatia, Romania and most of the countries of Central Europe, in North Macedonia, only after the significant expansion in 2007 and 2008, the ratio of bank deposits and loans reached 90%. Because the banking sector of North Macedonia did note finance its expansion from foreign funds, the sharp jump in the cost of capital for emerging economies, immediately after the collapse of, Lehman Brothers,, did not represent a problem for North Macedonian banking system.

While the relative isolation from the world financial market represented a dam for the negative effects of the crisis, due to a high integration in international trade, the recession in the world economy was quickly transferred to the North Macedonian economy. Reduced foreign demand and a sharp decline in metal prices caused exports to decline in the last quarter of 2008, and economic growth slowed to about 2% compared to about 6% growth in the previous three quarters.

2.Literature review

Although that there are not many empirical studies that analyze the impact of Global Financial crisis on economic activity in north Macedonia through the VECM model, however there are similar studies for other countries.

The impact of the external shocks on the economic activity of different economies is a subject of numerous and various analyses. S.Gulzar, GM Kayani ,(et al.2019) through VECM and the Johansen and Juselius cointegration test, examines the financial cointegration and spillover effect of the global financial crisis to emerging Asian financial markets (India, China, Pakistan, Malaysia, Russia and Korea) found long-term cointegration between the U.S. market and emerging stock markets, and the level of cointegration increased after the crisis period. The V.E.C.M. and impulse response function reveal that a shock in the U.S. financial market has a short-term impact on the returns of emerging financial markets. Hang Chiang and Chunlu Liu (2011) applied a Vector Correction Model with dummy variables to predict demand in the Australian construction market. The results of their study suggest that this model is acceptable for forecasting economic indicators and indicate that the growth in population, changes in national income, fluctuations in interest rates and changes in householder expenditure all play significant roles when explaining variations in construction demand.

M. Abduh.,MO Omar and J. Duasa (2011), analyze the dynamic relationship between macroeconomic variables and crisis with total deposit of Islamic banking using VECM and Cointegration test. They found that financial crisis is positively affecting total deposits in Islamic banks. In their study, D. M. Andrei and Liviu C. Andrei (2015) through the Vec Model found out that the economic crisis caused significant influence on FDI, imports, exports and GDP and rather no influence on labor, as reliable resource. Similarly to this, our study aims to estimate the effects of the Global economic and financial crisis on the North Macedonian economic activity through VECM model. We estimate the most important transmission channels of the crisis, and the effects on the key macroeconomic variables.

3.The effects of the crisis in North Macedonia in relation to key macroeconomic indicators

Although at the beginning of the crisis in the country, no major changes were felt in macroeconomic indicators, however, economic growth slowed down because European countries are the country's largest trading partners[1]. All of these had an impact on macroeconomic stability, maintaining the inflation rate within the expected framework and further reducing unemployment.[2]But should not overlooked the fact that crisis brought a great deal of uncertainty among investors who were planning to invest in the country. The financial crisis led to unprecedented use of non-standard monetary policy tools for two reasons. First central banks had to intervene in financial markets to prevent liquidity and solvency problems from possibly breaking down the monetary transmission mechanism. Since monetary policy had to be eased beyond what could be achieved by lowering short-term interest rates near their lower bound, a number of central banks had to pursue alternative policies of quantitative and credit easing. Thus, it is questioned that the policy-controlled short-term interest rate is the only tool of monetary policy[3]. During the crisis, central banks moved from the traditional way of conducting monetary policy to combining the objectives of monetary and financial stability. Most instruments have also become more complex due to unconventional measures designed to overcome the period of extraordinary

[1] Optimism about Macedonia's Economic Prospects, Set times The News and Views from Southeast Europe November,2011See:http://www.setimes.com/cocoon/setimes/xhtml/en_GB/features/setimes/features/2011/11/07/ feature-02
[2] IMF Satisfied with the Fiscal and Monetary Policy. Utrinski Vesnik. April, 2013
[3] Fahr, S., Motto, R., Rostagno, M., Smets, F., Tristani, O. Lessons for Monetary Policy. Strategies from the Recent Past. Sixth ECB Central Banking Conference, 2010.p. 27

circumstances affecting the performance of standard instruments. The new set of instruments was aimed at strengthening financial stability and economic recovery.

3.1.Crisis effects on GDP

The negative effects although through indirect channels of transmission, did not leave unaffected either developing economies, which face a significant slowdown in economic activity. Unlike the first half of 2008, when there was an opinion that the financial crisis would not be felt to a large extent in these countries, after the aggravation of the crisis in the last quarter of the year, it turned out that no country remained immune to its negative effects. The practice has confirmed the unsustainability of the opinion that the dynamic economic growth of fast-growing economies will continue and will be a sufficiently strong counterweight, which will contribute to neutralizing the economic slowdown in developed countries at the global level. Namely, in all rapidly growing economies, a significant slowdown in economic growth compare to the previous year is observed.

Table 1-Economic growth rate (annual GDP growth) 2007-2009

Regions and states	**Annual GDP growth**		
	2007	2008	2009
Global level	5,15%	3,20%	-1,32%
Developed countries	2,71%	0,85%	-3,79%
Eurozone	2,67%	0,86%	-4,23%
Emerging and developing economies	8,34%	6,11%	1,58%
North Macedonia	5,86%	5,00%	-2,00%
The largest foreign trade (export) partners of North Macedonia	6,91%	5,43%	-2,00%
Germany	2,51%	1,29%	-5,61%
Greece	4,04%	2,93%	-0,20%
Bulgary	6,16%	6,02%	-2,00%
Italy	1,56%	-1,04%	-4,45%

Source: IMF database, October 2008 and April 2009

The main indicator of the changes that occurred as a result of the economic crisis is the economic growth of the country. The observed GDP growth the first quarters of 2008 from an average of 6% decreased to 2% in the last quarter, which in itself indicated the beginning the impact of the crisis on the North Macedonian economy. The trend of decreasing economic growth continued during 2009, so the North Macedonia ended the second quarter of 2009 with -1, 4% GDP[1]. However, the numbers above indicate that the slowdown in economic activity of the North Macedonian economy, is significantly lower compare to European countries and the countries of the Region. Double decrease in economic activity was recorded in Turkey, Ukraine, Estonia, Lithuania, and the top of this list is Latvia where negative economic growth amounted to 18, 7% in the second quarter of 2009. Among the larger trade partners of North Macedonia, Germany was hit a 7, 1% negative growth and even more Slovenia, which despite the anti-crisis measures, that directly subsidized the companies, recorded a 9,3% drop.

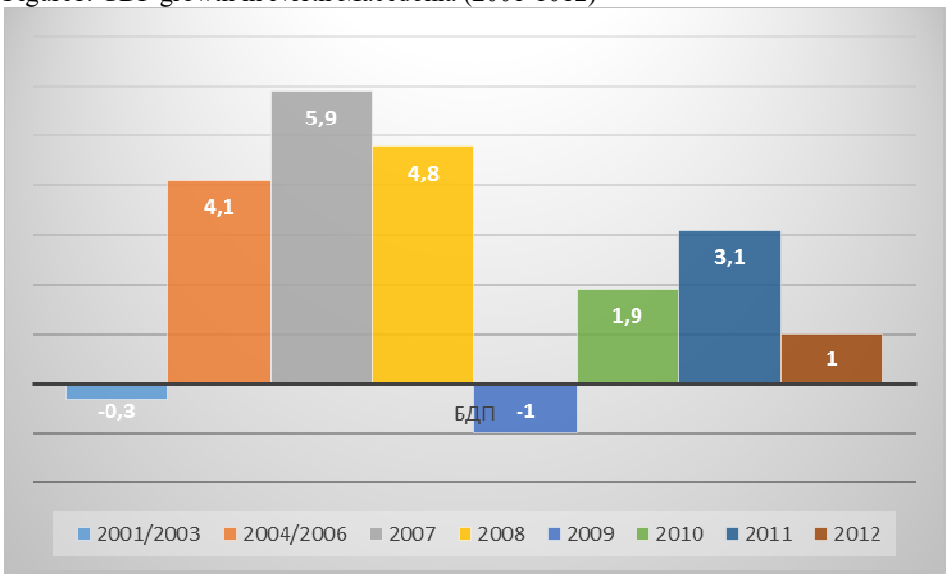
The decrease in exports continued in the first quarter of 2009, which had a key impact on the decline of the Gross Domestic period in this period of 0, 9% on an annual basis. In the first half of 2009 the economy entered the zone of negative annual changes, with the average decline in GDP during this period amounting to 1, 2%. However, the contraction of activity is significantly lower compared to other economies in the region and in Europe. This moderate rate of decline was mostly due to the positive contribution of net exports to GDP, that is, to the higher decline in import than exports. In addition, the decline in GDP was relativized by the greater resilience shown by personal consumption, while the population's income was still stable.

The slowdown in economic growth, as well as the constant downward revision of the expected rates of economic growth in the next two years in the countries that are the most important foreign trade partners of North Macedonia, largely contributed of the manifestation of indirect negative effects of the crisis in the economy. The slowdown in economic activity and consumption in these countries had a negative effects on the level of foreign demand and the position of North Macedonian export companies. In such conditions, in North

[1] State Statistics office, 18.09.2009, http://www.stat.gov.mk/pdf/2009/3.1.9.05.pdf

Macedonia, the external position inevitably worsened and economic activity slow down. The economic recovery from the crisis started in 2010 with the GDP of 1, 8%.

Figure1. GDP growth in North Macedonia (2001-1012)



Source: IMF, World Economic Survey, October 2010, April 2012, July 2012 and October 2012 and EBRD Database.

It can be seen from the figure that, although some economic recovery seemed evident in the first half of 2011, economic activity was reduced in the second half of 2011 and in the first half of 2012 as a result of the Eurozone crisis.

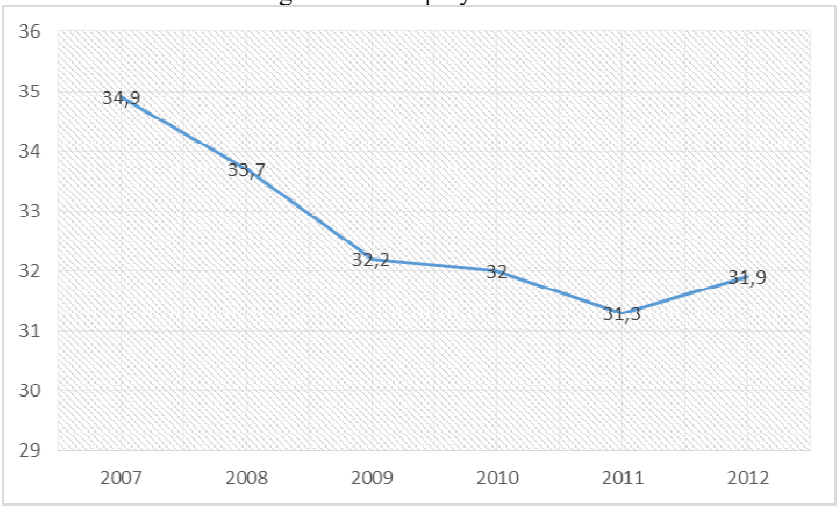
3.2.Crisis effects on the labor market (level of employment and unemployment)

North Macedonia is ranked among the countries that have highest unemployment rate. The unemployment rate in the country in the first quarter of 2009 was 32, 7% which is the lowest level compared to the past ten years, considering that in 1998 the unemployment was about 40%, and in 2006 was 36%. Intensive intervention measures and policies still managed to prevent further growth of unemployment rate in North Macedonia, although dealing with these high unemployment rates remains one of the biggest challenges for the economic policies.

The high unemployment rate remained above 30% during the entire period since the beginning of privatization and the transformation of the economic system from 1994 until 2012.

The unemployment analyzed since the beginning of the global economic crisis remained about 30%, recording a decline of 33,8% in 2008 to 31% in 2012, keeping us in the category of countries with the highest unemployment in Europe. During 2013, the unemployment was decreasing, but remained at extremely high level of 29%.

Figure 2. Unemployment in %



Source: International Monetary Fund, World Economic Outlook Database, October 2012

As key factors that determine the level of employment in the country, stand out for the low level of economic development, the low efficiency of the labor market and the high participation of long-term unemployment, while the quality of education is unaffected of the employment rate with an intensity like the previews listed one factors.[1]

3.3 Crisis effects on trade and the current account balance

Foreign trade was the basic transmission mechanism of the negative effects of the global crisis on the North Macedonian economy. About 50% of the North Macedonian export of goods and services is directed to five countries: Germany, Greece, Serbia, Bulgaria and Italy.

The global effect of the reduction of North Macedonian exports in 2009 (when North Macedonia achieved a negative GDP growth rate) compared to 2008 was 1.2 billion dollars, i.e. a reduction of 30%. At the same time, the largest decline was recorded with Greece, which was the most affected by the global crisis

Table 2-Foreign demand for North Macedonian products

Total exports (year)	**Total exports (in billion dollars)**	**Effects on exports**
2008	3,9	A decrease of $1,2 billion dollars
2009	2,7	
Total exports (country/year)	Total exports (in billion dollars)	Effects on exports
Greece 2008	536	A decrease of $146 billion dollars
Greece 2009	290	
Germany 2008	565	A decrease of $146 billion dollars
Germany 2009	450	
Italy 2008	321	A decrease of $103 billion dollars
Italy 2009	218	

Source: State Statistical Office: Statistical Yearbook of the Republic of North Macedonia for 2010 and 2011

The factors with a limiting effect on the growth of the North Macedonian GDP at the height of the crisis and in the post-crisis period were classified by the State Statistical Office as follows:

- Reduced foreign demand for 25%
- Reduced domestic demand for 20%
- Uncertain economic environment

The reduced foreign demand, the cancellation of orders by the foreign partners of the North Macedonian companies, as well as the reduced domestic demand had a negative effect on the reduction of the production of the companies (especially the export ones) and on their ability to regularly service the obligations to the banks for the previously mobilized loans.

Non-performing loans of enterprises grew by 6.7% in 2008 and by 34.8% in 2009.[2] The uncertain economic environment and the unfavorable perception of the region by foreign creditors and investors further complicated the situation of the enterprises sector.

Regarding the budget deficit, in the period from 1998 to 2008, North Macedonia recorded extremely low budget deficits, ranging from -0.4% to -1%. In 1999 and 2004 the budget balance was balanced, and 2005 and 2007 we even had a slight surplus. A small exception to this long tendency are only the conflict year 2001 and 2002, when the budget deficit amounted to -5.9 and -5.6%, respectively.

[1] Mojsoska-Blazeski N., Kurtishi N., "The Macedonian Labour Market: What makes it so different?", MPRA Paper No. 42045, 2012, достапно на http://mpra.ub.uni-muenchen.de/42045/
[2] State Statistical Office, 2011

Table 3. The budget deficit, inflation and GDP in the period from 1993-2007

Year	Deficit	Inflation	GDP
1993	-13,4	350	-7,5
1994	-2,9	122	-1,8
1995	-1,2	15,9	-1,1
1996	-0,5	3,0	1,2
1997	-0,4	4,4	1,4
1998	-1,7	0,8	3,4
1999	0,0	-1,1	4,3
2000	-1,8	05,8	4,5
2001	-5,9	5,5	-4,5
2002	-5,6 -	1,8	0,9
2003	1,1	1,2	3,1
2004	0,1	0,4	4,7
2005	0,2	0,5	4,7
2006	-0,5	3,2	5,1
2006	0,6	2,3	6,1

Source: Transition report 2004,EBRD, London 2004, p.38-41, Ministry Bulletin for finances of the Republic of North Macedonia, no.9-10 2004, Skopje and NBRM.

In 2009, North Macedonia recorded a negative GDP growth rate, really low, of only -0.4% but this in relation to 2008, when the growth rate was 5.5%, still represented a significant decrease. In 2009 the budget deficit was -2.6% and in 2010 was -2.4%. Such budget deficits can be treated as normal anti-cyclical measure in times of recession, but also that they should start reducing quickly. Unfortunately, the budget deficits, instead of decreasing, continued to increase: -3.8% in 2012, -3.9% in 2013, -4.2% in 2014. With this dynamic of growth of budget deficits and accumulation of the country's public debt for a period of six years (2008-2014) the public debt of North Macedonia doubled from 23% as a share of GDP in 2008 to 46% in 2014.

Table 4. The budget deficit and public debt

Year	2008	2009	2010	2011	2012	2013	2014	2015
Budget deficit	-0,9	-2,6	-2,4	-2,5	-3,8	-3,9	-4,2	-3,5
Public debt	23,0	26,2	27,2	32,0	38,4	40,4	45,9	46

Source: National Bank of Republic of North Macedonia

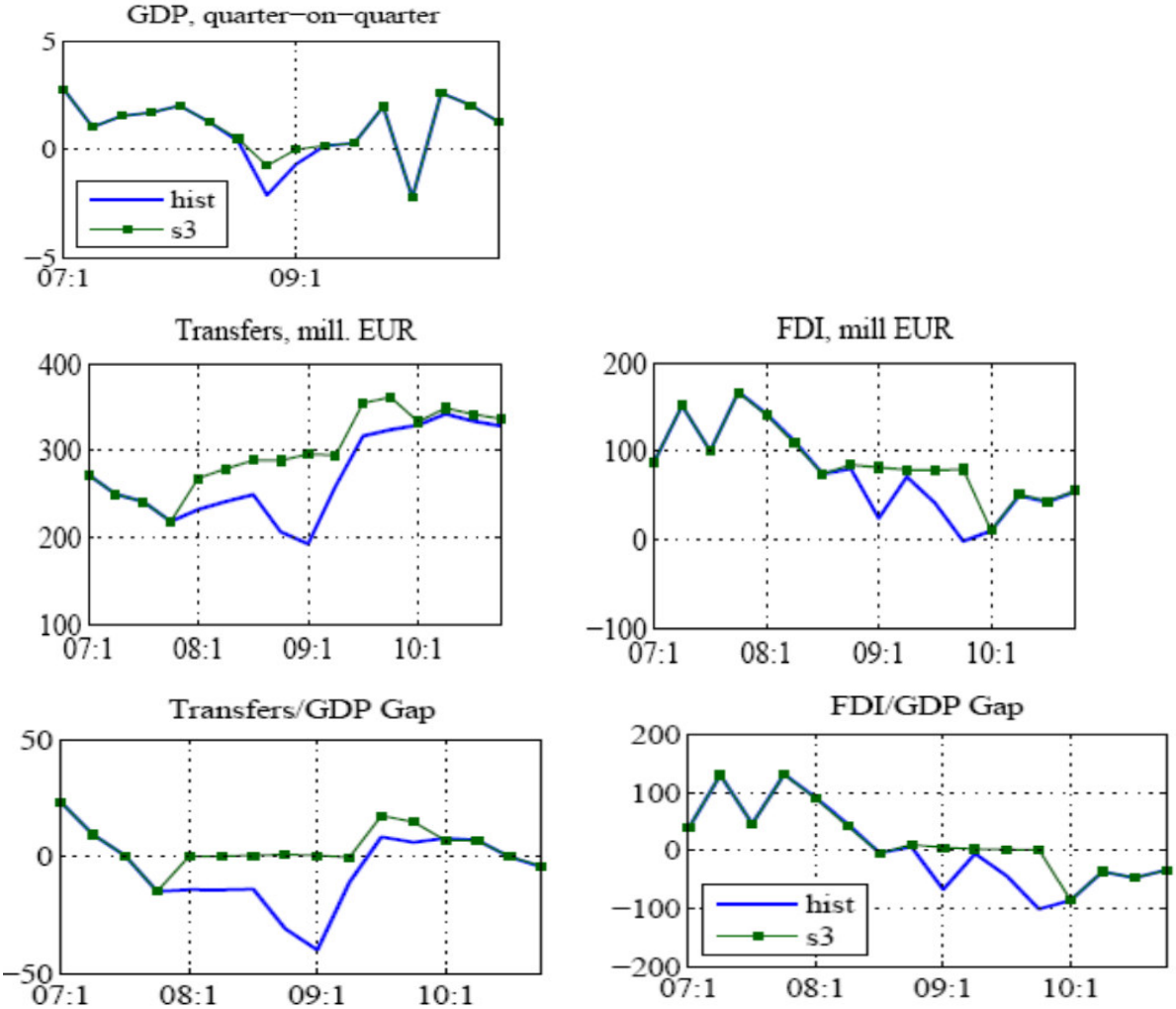
The data confirm that the relatively low budget deficits, in a small country, with a modest export performance and with economic growth rates significantly below the potential of the economy, in a period of six years resulted in a doubling of a public debt.

3.4 Crisis effects on foreign direct investments

The Global financial crisis also resulted in lower confidence, which affected the decisions of households and businesses, as well as overall economic trends. Similar to the previews crisis channel, a precise estimate of trust effects does not exist, so a degree of arbitrariness is also involved in this approximation. The effects of a loss of trust can be presented in two ways. First, lower consumption and business confidence affected private consumption and business investment, which further affected GDP. Statistic data show that the biggest drop in quarterly GDP occurred in the last quarter of 2008 and in the first quarter of 2009. In particular this period includes the largest quarterly decline in consumption during the crisis, as well as quarterly decline in private investments. The second way we approximate the effects of a loss of confidence is quite specific for North Macedonia and is related to two components of balance of payments: FDI and especially private transfers. The great uncertainty regarding the European crisis and the potential effects on North Macedonia resulted in a sharp slowdown in private transfers between the end of 2007 and the beginning of 2009. This movements of transfers reflects both the lower inflow of remittances and the greater preference for holding foreign currency by households. In addition, the uncertainty affected the decisions of foreign companies to postpone or cancel their investments in North Macedonia. Therefore, in order to capture the effects of loss of confidence on private transfers and FDI we assume that the deviation FDI/GDP ratio from its steady state stay is zero, instead of negative in 2008 and 2009.[1]

[1] In MAKPAM the steady state rates of transfers and FDI to GDP are defined as their average shares between 2005 and 2015.

Graf. 1. Confidence effects: Real data vs assumed movements in the „no crisis" scenario



In the period after 2007, according to the data of National Bank of North Macedonia, Foreign Direct Investment manifested tendency of obvious decrease- in 2007 they amounted to nearly 700 million dollars, in 2009 they fell to 197 million dollars, then they recorded an increase, and in 2012 they decreased to 132 million dollars.

4. Research methodology

4.1.Data and descriptive statistics

In the regression models of the time series for the Republic of North Macedonia, quarterly data will be used starting from the first quarter of 1997, until the second quarter of 2021, and the same will be provided by the State Statistical Office and the National Bank of the North Macedonia.

During the analysis period the average growth of real GDP was 2.67 percent.

Table 5. Descriptive statistics of the data

Variables	Average	Standart deviation	Min	Max	Observations
Economic growth	2.679348	4.540332	-14.92	14.37	92
Real GDP (2010 Prices))	88389.62	18046.52	55377.2	124992	96
Fiksed capital in milion denars	24666.84	8277.627	12443.47	37292.82	84
Indeks of trade openness	99.59565	22.37768	51.7	143	92

Source: Author's calculations

4.2 Empirical results

To examine the impact of crises on the economic growth of the Republic of North Macedonia, it is used the method of least squares (OLS) and VECM model.

From the results obtained from the least squares method, it can be seen that the convergence rate has been achieved because the initial real GDP is statistically significant at 5% significance level, which reveals that the

country is converging to its „steady state, in the analyzed time period. The coefficient of physical capital has a positive effect on economic growth and is statistically significant at 5% statistical significance. The trade openness coefficient is positively related to economic growth but statistically insignificant. Also, the labor force rate used in this model, has a positive sign and is statistically significant at the 5% level.
While the coefficient of the dummy variables has a negative sign (table 6).

Table 6. Regression model results via the OLS method

GDPG	**Coef.**	**Std. Err.**	**T**	**P>|t|**	**[95% Conf. Interval]**	
Dlog_RGDPt-1	157.6354	67.12762	2.35	0.021	23.93914	291.3316
Dlog_GFCF	36.20965	17.65813	2.05	0.044	1.040446	71.37886
Dlog_TRADE	.0253534	.0591482	0.43	0.669	-.0924506	.1431573
Dlog_LFPR	69.35599	29.10078	2.38	0.020	11.39676	127.3152
D1	-.6424334	1.533801	-0.42	0.677	-3.697262	2.412395
_cons	2.160078	.5436435	3.97	0.000	1.077318	3.242837

Source: Author's calculations

4.3 VECM model results

Before running the VECM model, the order for the selection of the number of lags (lags selection) of the variables is carried out, so that based on the Akaike information criterion (AIC) the optimal order of lags (lag order) for the used variables is four. According to the stationarity of the time series using the Dicky-Fuller and Philip Perron tests, the results obtained that all variables are non-stationarity at the level but become stationary at the first difference, indicate that the VECM model is appropriate for the used variables such as: real GDP, physical capital, trade openness and the labor force rate.

After carrying out the stationarity tests, it was investigated whether there is a long-term relationship between the used time series, i.e. the Johansen test for cointegration is performed. According to the obtained results, there is one cointegrated equation, which means that there is a long-term relationship between the used variables (table 7)

Table 7. Johansen test of cointegration

Johansen tests for cointegration
Trend: constant — Number of obs = 80
Sample: 2001q1 - 2020q4 — Lags = 4

Max Rank	Parms	LL	Eigenvalue	Trace Statistic	5% Critical Value
0	52	78.805418	-	61.6196	47.21
1	59	97.929851	0.38005	23.3707*	29.68
2	64	107.52725	0.21332	4.1759	15.41
3	67	108.88384	0.03335	1.4627	3.76
4	68	109.61521	0.01812		

Source: Authors calculation

Then, with the VECM model is examined the long-term and the short-term relationship between the used variables and the artificial variables that examine the effects of crisis, i.e. The Global Financial crisis.

Table 8. Cointegrated vector results according to Johansen's procedure

Variables	β	α
Dlog_(GDPG)	1.000	-0.906982*** [0.000]
Dlog_(GFCF)	-0.4010743*** [0.000]	0.1166704 [0.002]***
Dlog_(TRADE)	-0.2745962*** [0.000]	0.3679634** [0.028]
Dlog (LFPR)	0.9166161*** [0.004]	0.005101 [0.902]
D1	0.0488057** [0.047]	0.4800003 [0.105]

Source: Authors calculations

The long run Beta coefficients just like those of the last squares model, have the same effect on economic growth. So physical capital and trade openness have a positive effect on economic growth, while the labor force rate and the global financial crisis have a negative effect. The interpretation of these coefficients is with the

opposite sign, so they have an asymmetric effect of what was obtained (table above).

The adjustment term $ECT_{t-1} = 0.9$ is statistically significant at the 1% level, suggesting that the errors of the previous year or the deviation from the long-run equilibrium) are corrected during the current year with a convergence rate of 90%.

Conclusion

Based on the models that examines the impact of the Global financial crisis on economic growth of North Macedonia, where GDP is the dependent variable and the independent variables are: gross fixed capital (GFCF) as percentage of GDP, reflecting the impact of physical capital accumulation, population growth rate (POP), trade openness (TRADE) which represents the ratio of total value of imports and exports of GDP and the dummy variable with which we assess the effects of Global financial crisis on economic growth, we conclude that Global financial crisis has a negative sign which means that the crisis negatively affected the economic growth in the observed period.

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