

ANALYSIS OF THE IMPACT OF MONETARY POLICY ON ECONOMIC GROWTH IN THE REPUBLIC OF CROATIA

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ABSTRACT

The purpose of this paper is focused on the influence of monetary policy on the economic growth of the Republic of Croatia, that is, on GDP growth. Using the linear regression method, a correlation analysis of the connection between independent variables (unemployment rate, inflation rate, level of the discount rate, level of the reserve requirement and the level of the interest rate on Lombard loans) and the dependent variable (GDP per capita) was conducted, and at the end, a multiple regression analysis was conducted of independent variables and the dependent variable, i.e. GDP per capita. Data on the mentioned variables were collected from secondary publications of the Croatian National Bank, and for this purpose appropriate statistical methods were used in the Microsoft Excel program. The general conclusion of the aforementioned analysis is that monetary policy in certain segments significantly affects the economic growth of the Republic of Croatia.

Keywords: monetary policy, economic growth, GDP, Republic of Croatia

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INTRODUCTION

In modern economies, monetary policy is a key and necessary tool for influencing economic trends in a given country. Some of the most important goals of monetary policy are maintaining price stability, achieving full employment, sustainable economic growth, and stability on the financial and foreign exchange markets. Monetary policy is considered the main tool in the fight against inflation, but at the same time it is expected to play an active role in stimulating economic growth. In Croatia, monetary policy is implemented by the central bank, namely the Croatian National Bank (HNB), whose main goal is to maintain price stability. To achieve this goal, the CNB uses various instruments of monetary policy, such as open market operations, the reserve requirement rate and the discount rate.

REVIEW OF THEORETICAL KNOWLEDGE OF MONETARY POLICY

Monetary policy is a set of decisions made by central banks to influence the price and availability of money in the economy. The main reasons for the existence of monetary policy are: money, monetary system, currency and price stability. Mishkin and Frederic [1] point out that monetary policy is one of the most important policies of any country and is extremely important for the entire economy and general well-being of the country, and that it is particularly effective during financial crises. Nowadays, it is impossible to imagine a modern economy without a quality monetary policy [2]. In its work, monetary policy uses a number of instruments to achieve the goals it wants to achieve. Rohatinski [3] emphasizes that "monetary policy is a set of rules, regulations, measures and instruments that regulate the level, structure and dynamics of the money supply in the monetary sphere of social reproduction, and the circulation of money in traffic reproduction channels". The main goal of monetary policy is to maintain price stability. Hall and Robert [4] point out that stable prices are a prerequisite for ongoing liquidity and sustainable economic growth. This means achieving a slightly positive inflation rate in the long term, which is a prerequisite for current liquidity and sustainable economic growth.

According to Samodol [5], the openness of the economy is considered one of the factors that contribute to economic growth. Various monetary variables such as money supply, exchange rate and inflation affect the level of openness of the economy. Trade openness is defined as the share of exports and imports in GDP, while export and import openness are determined by the share of exports and imports individually in GDP. Raspuđić and Golomejčić [6] point out that every organization, activity or policy has its own goal that it wants to achieve, including monetary policy that aims to maintain price stability in order to ensure economic growth, a high employment rate and an improvement in living standards. The use of monetary policy instruments can be complex, and the strategy is implemented through three levels of goal achievement: ultimate goals, intermediate goals, and operational goals, as explained by Gómez- Puig and Sosvilla-Rivero [7]. The criteria for choosing indirect goals are: measurability, controllability and predictability of the impact on the goals. Operational objectives are incorporated into the monetary policy implementation strategy because they are highly sensitive to the instruments of that policy.

In growth regression equations, the inflation rate is often used as an indicator of monetary policy. The development of theoretical and empirical knowledge about inflation has changed over the past decades, from the understanding that inflation can help increase production and reduce unemployment, to the belief that inflation and growth are negatively related [8]. Most economists today agree that a high inflation rate and its variability negatively affect economic growth. Pourgerami and Assane [9] found a negative relationship between inflation and growth, but this relationship was not statistically significant. Stanners [10] found no evidence that a low inflation rate was associated with faster economic growth, nor that a low inflation rate was an underlying or key condition for high growth rates. However, he did not find evidence for the claim that inflation has a positive effect on growth. Although in some cases a low rate of inflation was associated with rapid growth, almost always a high rate of inflation was not matched by sustained growth.

Ghosh [11] investigates whether global economic and financial instability in the 21st century is different from the instability and crises that occurred in the 20th century and states that expansionary monetary policy, also called "cheap money" policy, continues to be applied in an economy in crisis. This policy enables economic entities to have easier access to money, reduces interest rates on loans, increases the amount of money in circulation, increases investments and personal consumption, which should stimulate the growth of total production and employment. On the other hand, restrictive monetary policy

is applied when the economy operates in a state of prosperity or inflation, and in such a case the amount of money in circulation decreases. This leads to an increase in interest rates, a decrease in investments and personal consumption, all with the aim of stabilizing prices and suppressing inflation.

MONETARY POLICY OF THE REPUBLIC OF CROATIA

The Croatian National Bank (HNB) is responsible for monetary policy in Croatia and has six areas of responsibility, which include price stability, management of international reserves, financial stability, supervision, rehabilitation of credit institutions and payment transactions [12]. The main goal of the CNB is to maintain low and stable inflation in line with the goals of the European Union, which include balanced and sustainable economic growth and a high level of employment. Secondary goals are subordinate to the primary goal, and price stability is a key prerequisite for sustainable economic growth. This does not mean that the inflation rate should be zero, but slightly positive in a longer period of time [13].

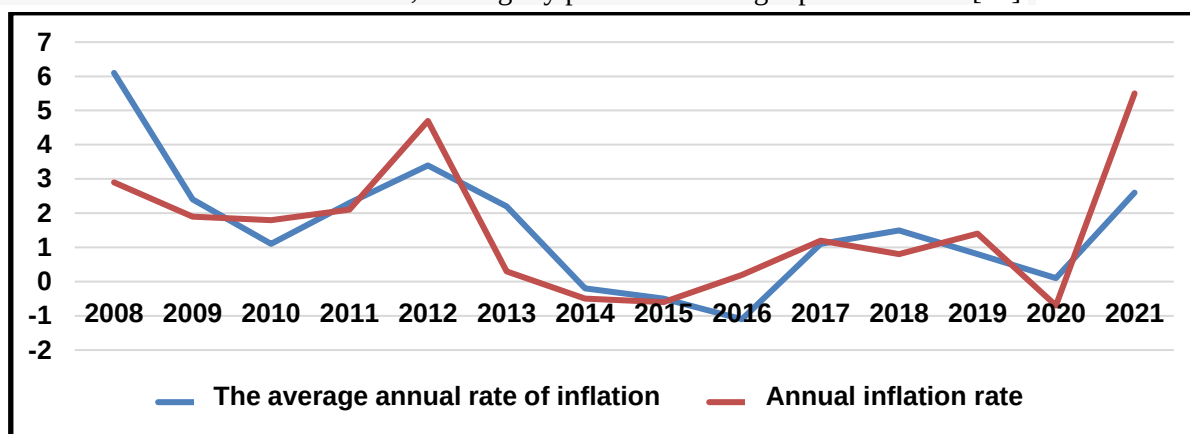


Chart 1. Movement of inflation in the Republic of Croatia from 2008 to 2021 in %

Source: author's systematization

The Croatian National Bank uses various tools and measures to implement its monetary policy, which includes regulating the credit activity and liquidity of banks and the amount of money in circulation. The bank applies various instruments such as mandatory market operations, reserve requirements and other measures to increase or decrease liquidity [14]. For example, by purchasing assets or granting loans, the bank increases liquidity, while using them will increase liquidity mandatory reserves, by selling assets or reduce liquidity by issuing securities. The CNB most often relies on foreign exchange interventions and mandatory reserves in order to achieve its goals. By combining these instruments and measures, the bank tries to maintain price stability and achieve other objectives of its monetary policy.

ANALYSIS OF THE EFFECT OF MONETARY POLICY OF THE REPUBLIC OF CROATIA ON ECONOMIC GROWTH

In this part of the paper, the movement of the GDP of the Republic of Croatia in the period from 2000 to 2021 will be shown and it will be correlated with the movement of the unemployment rate, the movement of the inflation rate, the level of the discount rate, the level of the reserve requirement and the level of the interest rate on Lombard loans. All the mentioned parameters have a certain influence on the movement of GDP, so the influence of each of them will be shown. All data on the movement of the quantities in question were collected from the secondary publications of the Croatian National Bank.

Table 1. Movement of GDP in the Republic of Croatia from 2000 to 2021

Year	GDP (mil . EUR)	GDP per capita (EUR)	GDP - annual rate of change
2000	23,682	5,351	2.9%
2001	25,986	6,044	3.0%
2002	28,773	6,688	5.7%
2003	31,011	7,206	5.5%
2004	33,779	7,847	4.1%
2005	36,805	8,539	4.3%
2006	40,546	9,405	4.9%
2007	44,272	10,272	4.9%
2008	48,338	11,216	1.9%
2009	45,416	10,549	-7.3%
2010	45,596	10,615	-1.3%
2011	45,408	10,608	-0.1%
2012	44,509	10,430	-2.3%
2013	44,359	10,423	-0.4%
2014	43,944	10,368	-0.3%
2015	45,211	10,755	2.5%
2016	47,271	11,324	3.5%
2017	49,913	12,101	3.4%
2018	52,718	12,896	2.9%
2019	55,604	13,678	3.5%
2020	50,224	12,408	-8.1%
2021	57,232	14,718	10.2%

Source: author's systematization

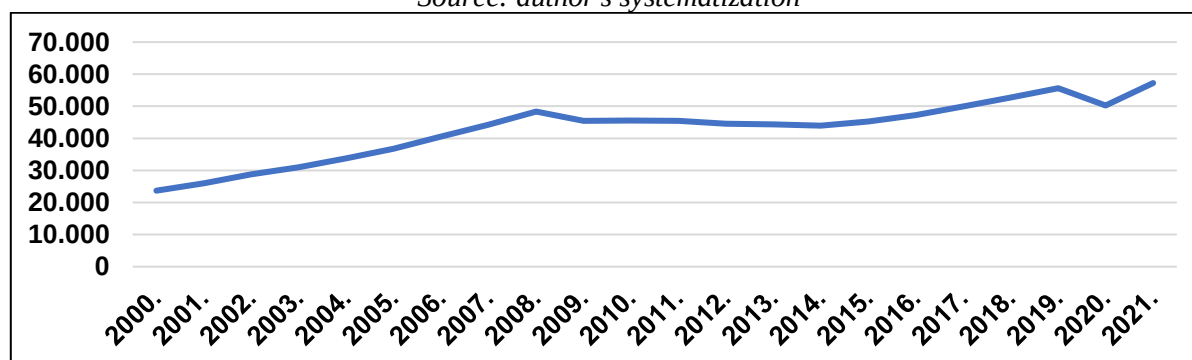


Chart 2. Movement of the value of GDP in the Republic of Croatia from 2000 to 2021 (million EUR)

Source: author's systematization

It is evident from the attached graph the movement of the total value of GDP in the observed period had its ups and downs. Thus, the value in 2000 amounted to 23,682 million euros and had a continuous growth until 2008, when it amounted to 48,338 million euros, which was a record level until then. However, then the global financial crisis occurred, which hit Croatia hard, so that in 2009 the value of GDP fell to 45,416 million euros, and the value of GDP reached the pre-crisis level only in 2017, when GDP amounted to 49,913 million euros. Several years of growth followed, and in 2019 a new record of EUR 55,604 million was reached, but there was a sharp decline again in 2020, due to the COVID-19 pandemic, when the value of GDP was EUR 50,224 million, which is a drop of more than 5 billion euros. Fortunately, Croatia recovered relatively well from that pandemic year, and in 2021 the value of GDP reached a record 57,232 million euros, and the result would probably have been even better if that year had not been heavily burdened by problems and restrictions related to the COVID pandemic.

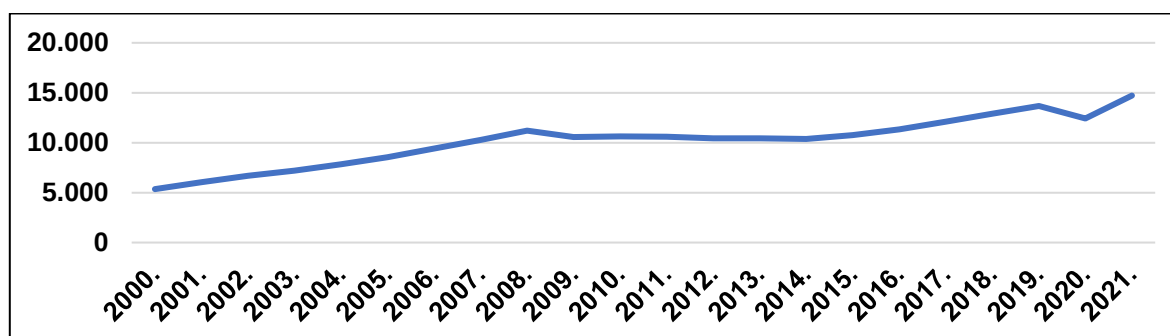
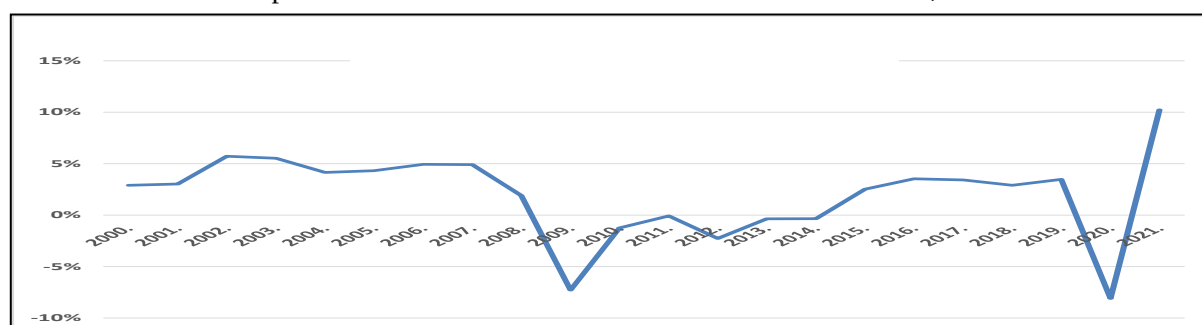


Chart 3. Movement of GDP per capita in the Republic of Croatia from 2000 to 2021 (EUR)

Source: author's systematization

The movement of the value of GDP per inhabitant in the observed period has practically the same trend as the movement of the value of the total GDP. Thus, the value in 2000 amounted to 5,350 euros and continued to grow until 2008, when it amounted to 11,216 euros, which was a record level until then. However, then the global financial crisis began, which hit Croatia hard, so that in 2009 the value of GDP per inhabitant fell to 10,549 euros. In the following years, this level did not change too much and only in 2016 did it reach the pre-crisis level, when GDP per inhabitant was 11,324 euros. Several years of growth followed and in 2019 a new record of 13,678 euros was reached, but there was a sharp drop again in 2020, due to the COVID-19 pandemic, when the value of GDP per inhabitant was 12,408 euros, which is a drop of more than 1,200 euros. Fortunately, Croatia recovered relatively well from that pandemic year, and in 2021 the value of GDP per inhabitant reached a new record and amounted to 14,718 euros.



Graph 4. Annual rate of change of GDP in the Republic of Croatia from 2000 to 2021

Source: author's systematization

GDP had good growth rates in the period until 2007, when they ranged between 4 and 5% per year. Then the global financial crisis appeared, which already in 2008 led to an increase in GDP of only 1.9%, only to be followed by a steep decline of 7.3% the following year. The big problem of the Croatian economy was that the crisis in Croatia lasted much longer than most countries, because they already had positive growth rates in 2010, while in Croatia GDP grew by 2.5% only in 2015. In the following years, growth moved at a level of approximately 3% per year, and then in 2020, with the onset of the COVID-19 pandemic, there was a strong drop again, which amounted to -8.1%, which was a bigger drop than in the crisis year of 2009. Nevertheless, thanks to numerous measures, as well as a much better general state of the economy than it was at the time of the global financial crisis, Croatia achieved a GDP growth rate of 10.2% in 2021, which is certainly a good indicator. In the rest of the paper, the influence and interrelationship of certain variables on the movement of GDP in Croatia is presented, namely the unemployment rate, the inflation rate, the level of the discount rate, the level of the reserve requirement rate and the level of the interest rate on Lombard loans. When talking about the unemployment rate, it decreased until 2008, when it amounted to 8.5%. After that, the global financial crisis occurred, which caused major problems for many companies, especially in the construction industry, so that in the following years the unemployment rate grew until 2014, when it reached a record 17.3%, after which Croatia finally exits from the crisis, economic activity is increasing (but also population emigration due to membership in the European Union), so that the unemployment rate in 2019 reached a record low level of 6.6%. However, due to the COVID-19 pandemic, in the next two years the unemployment rate increased to 7.6%, but further recovery and reduction of that number is expected.

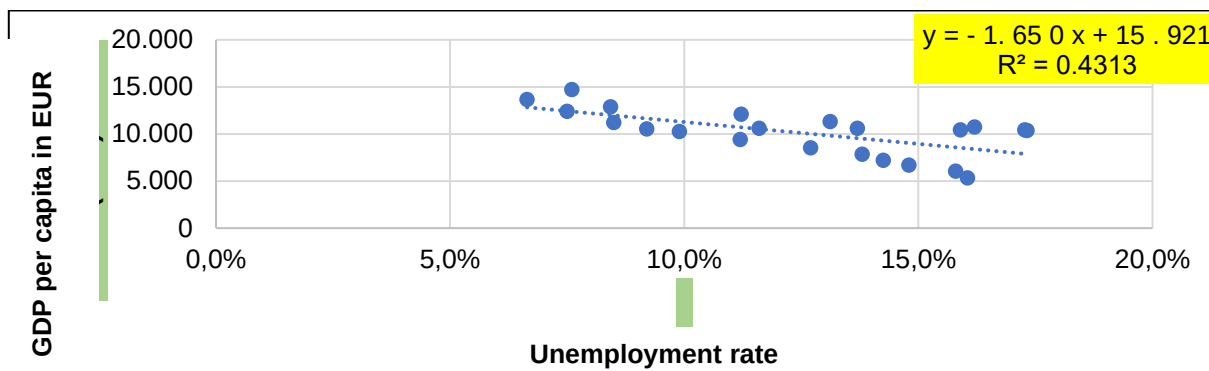


Chart 5. Correlation between the unemployment rate and the value of GDP per capita

Source: author's systematization

Croatia should continue to implement active employment policy measures, which refer to measures aimed at directly employing the unemployed or increasing their employability. Active measures of the employment policy refer to education, retraining, further training, professional training, etc., and they improve the qualification structure of the labor contingent, thereby improving their competitiveness on the labor market, i.e., increasing their employment opportunities.

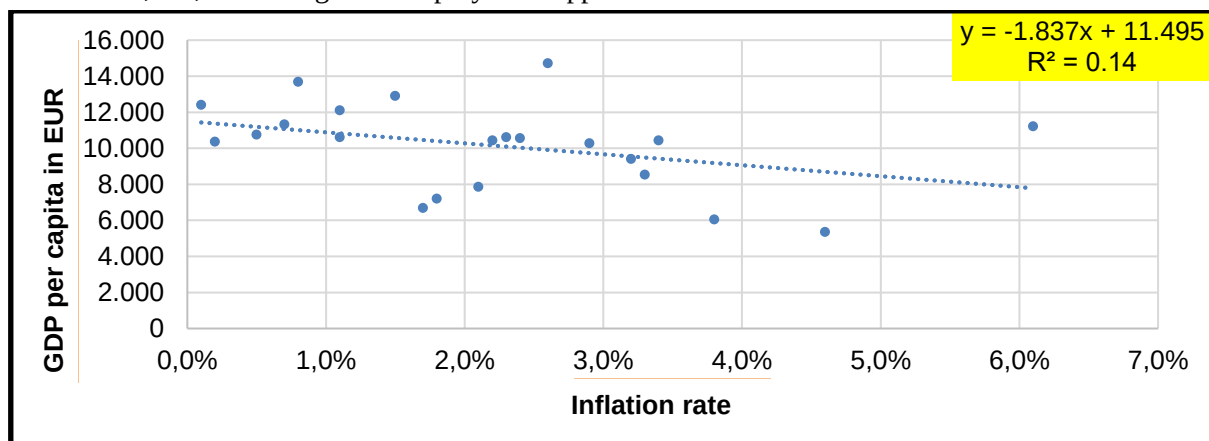
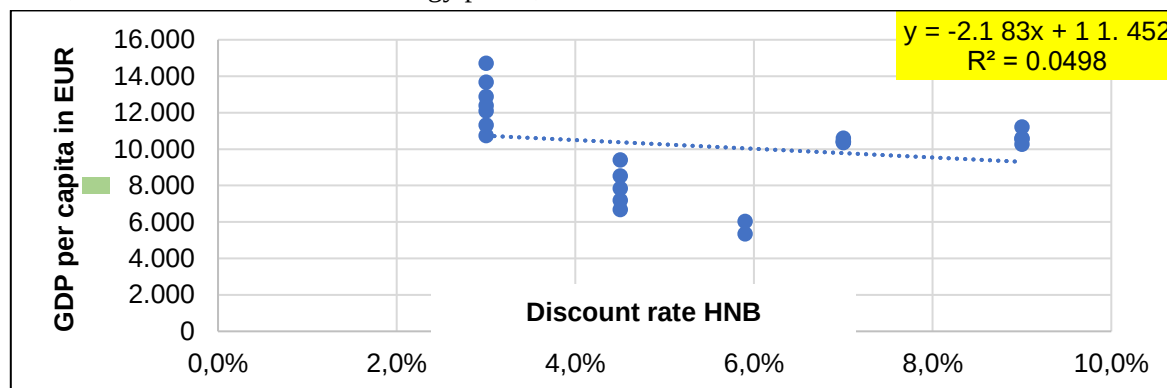


Chart 6. Correlation between the inflation rate and the value of GDP per capita

Source: author's systematization

As for the inflation rate in Croatia, it had a changing direction of movement throughout the observed period. Thus, the inflation rate was falling until 2002 and amounted to 1.7%, and in the following years it would grow and reach its highest (record) value in 2008, when it amounted to 6.1%. After that year of crisis, inflation decreased again and reached its lowest level in 2014, when it amounted to 0.2%. In the following years, it moved at the level of approximately 1-1.5%, after which it falls to 0.1% in 2020, but then rises to 2.6% in 2021. There are no final data yet for 2022, but a fairly high level is expected, given the numerous negative circumstances that are happening, from the COVID-19 pandemic, the war in Ukraine, the rise in fuel and other energy prices, and the like.



Graph 7. The relationship between the amount of the discount rate and the value of GDP per capita

Source: author's systematization

Furthermore, the level of the CNB's discount rate was at the level of 4.5% until the global financial crisis, and from 2007 it rose to a high of 9%. After that, it was reduced to 7% in 2011, and the last reduction of the CNB discount rate was in 2015, when it was reduced to the level of 3% and is still in effect. By reducing the discount interest rate, the CNB is trying to reduce the pressure on the money and foreign exchange markets caused by the change in the law regulating the conversion and write-off of loans in Swiss francs. This will stimulate monetary movements which The CNB wants to continue the process of debt relief for the population and companies. With such low interest rates, the cost of borrowing is lower because the sources of liquidity are more favorable.

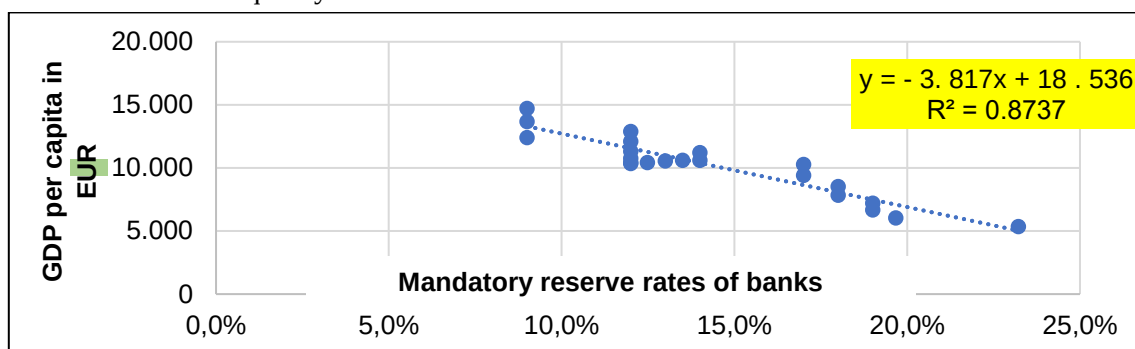


Chart 8. The relationship between the level of the reserve requirement and the value of GDP per capita
Source: author's systematization

During the entire observed period of about 20 years, the CNB continuously lowered the reserve requirement ratio. In this way, he controlled the money supply and ensured the monetary stability and liquidity of banks and the banking system as a whole. By lowering the required reserve ratio, the CNB issued primary money throughout the period, i.e. increased the liquidity of the banking system.

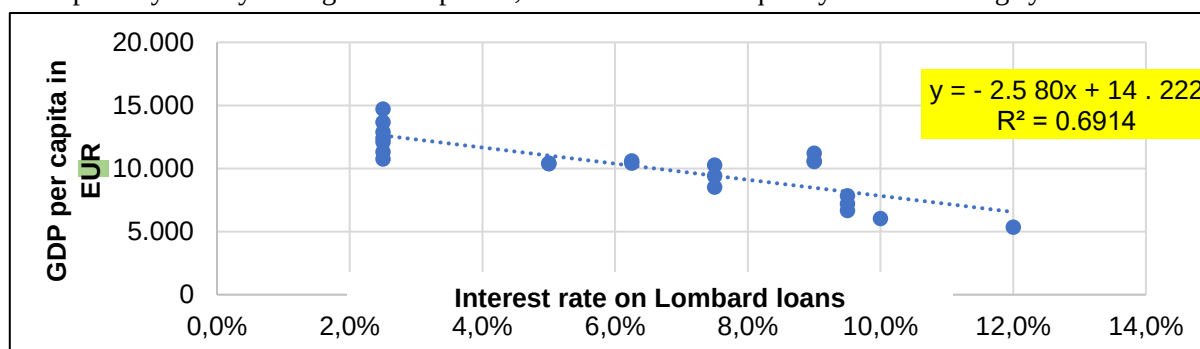


Chart 9. The connection between the interest rate on Lombard loans and the value of GDP per capita
Source: author's systematization

The interest rate on Lombard loans decreased during the entire period (from 2000 to 2008), that is, until the onset of the global financial crisis, when it increased again from 7.5% to 9.0%. This lasted for 3 years, and in 2011 the interest rate dropped again to 6.3% and continued to decrease further, and the last decrease was in 2015, when the rate dropped to 2.5%, which remains until today. Based on the data used in the previous part of the paper, the factors of the movement of the value of GDP per inhabitant in Croatia from 2000 to 2021 are processed statistically using correlation analysis and regression model.

Table 2. Correlation matrix of independent variables

	GDP PER CAPITA	INFLATION RATE	UNEMPLOYMENT RATE	MANDATORY RESERVE RATE	ESKONTNA STOPA
GDP per capita	1.00				
Inflation rate	-0.36	1.00			
Unemployment rate	-0.66	-0.04	1.00		
Required reserve ratio	-0.93	0.51	0.45	1.00	
Eskontna stopa	-0.22	0.48	0.15	0.22	1.00

Source: author's systematization

The independent variables are not highly correlated with each other. It can be seen that the inflation rate is most closely related to the reserve requirement rate and the discount rate. Furthermore, the second correlation test showed that there is a very strong and negative correlation between the level of GDP per inhabitant and the reserve requirement ratio (-0.93%). A relatively weak and negative correlation was recorded between GDP per capita and the inflation rate (-0.36%) and between GDP per capita and the discount rate (-0.22%). According to theoretical beliefs and empirical evidence, it is assumed that all observed independent variables have a negative effect on the movement of GDP per capita.

Table 3. Synthesized presentation of regression analysis results

Regression Statistics					
Multiple R	0.972				
R Square	0.944				
Adjusted R Square	0.931				
Standard Error	632,381				
Observations	22,000				
ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	4,000	115,645,757,577	28,911,439,394	72,296	0.000
Residual	17,000	6,798,401,046	399,905,944		
Total	21,000	122,444,158,623			

Source: author's systematization

It can be seen that the F statistic is 72.30, the p-value is 0.000 and is less than $\alpha = 0.05$, indicating that the regression model as a whole is statistically significant. This complex and multiple correlation shows that it is possible to accurately predict the results of annual changes in GDP per capita using a set of independent variables, since it has a value very close to 1, that is, there is a high correlation between the dependent and independent variables at the level of 97%. The coefficient of determination (R^2) suggests that about 95% of the variation in GDP is explained by the 4 independent variables included in the regression model, while the corrected coefficient of determination of 0.93% confirms the high degree of model fit and the relevance of the variables in the model.

Table 4. Multiple regression model of GDP per capita from 2000 to 2021

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P- value</i>
Interception	20,025,461	654,967	30,575	0.000
Inflation rate	105,258	115,458	0.912	0.375
Unemployment rate	-187,877	50,189	-3,743	0.002
Bank reserve requirement rate	-526,119	50,332	-10,453	0.000
CNB discount rate	-32,925	71,998	-0.457	0.653

Source: author's systematization

The analyzed independent variables (unemployment rate, inflation rate, reserve requirement rate and discount rate) and their associated coefficients match the theoretically expected values and their signs. When it comes to the inflation rate, it can be concluded that a relatively low inflation rate, in the range of 2 to 3%, has a stimulating effect on the Croatian economy, therefore the regression model showed a strong positive effect on the level of GDP per capita. When it comes to the unemployment rate, it is evident that it has a strong negative impact on the movement of GDP per capita. The level of the discount rate also has a negative, but not as strong, influence on the movement of GDP per capita, but that is why it is necessary to highlight the level of banks' required reserve ratio, which shows the strongest negative influence on the movement of GDP per capita, which means that a high level required reserves slow down and reduce the credit activity of banks, and thus the financing of economic activities.

CONCLUSION

The results of the analysis of the impact of monetary policy on economic growth in the Republic of Croatia showed that monetary policy has a large influence on economic growth, which was proven through the processing of variables. Furthermore, the analysis showed that the unemployment rate negatively affects economic growth, i.e. GDP, while on the other hand it proved that a relatively low and stable inflation rate has a positive and stimulating effect on economic growth, i.e. GDP growth. Likewise, it was seen that all CNB interest rates do not have the same effect on economic growth, or GDP. In conclusion, the variable of the amount of the discount rate has a negative but relatively weak impact on GDP growth, while on the other hand, the amount of the reserve requirement has an extremely strong and negative impact on economic growth, or GDP.

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