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An Empirical Assessment Of Macroeconomic Determinants Of Bank Deposits In North Macedonia: Evidence From 2015–2024 Quarterly Data

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Abstract: This paper conducts an empirical analysis to identify and evaluate the key macroeconomic factors—such as GDP, deposit interest rates, inflation, and unemployment—that influence the level of bank deposits in North Macedonia. The analysis is based on quarterly data from the National Bank and the State Statistical Office, covering the period from the first quarter of 2015 to the fourth quarter of 2024, with a total of 40 observations for each variable.

The findings indicate that an increase in deposit interest rates and the level of inflation play a significantly positive role in determining the level of deposits. Conversely, rising unemployment exerts a negative impact. GDP, however, does not appear to have a statistically significant effect on the level of deposits.

This research contributes to a deeper understanding of depositor behavior in emerging economies and offers important policy implications for financial stability and effective monetary management in North Macedonia.

Keywords: deposits, inflation, GDP, interest rates, unemployment

INTRODUCTION

Banks play a fundamental role in the financial system by mobilizing deposits from individuals with surplus funds and reallocating them in the form of loans to those in need of capital. Through this intermediation process, banks contribute to the efficient allocation of resources, support financial system development, and promote economic growth.

According to the most recent report published by the Central Bank of the Republic of North Macedonia, in December 2024, which outlines the latest macroeconomic indicators, moderate and stable global economic growth is projected for the period 2024–2026. Nevertheless, the report also highlights that a slow increase or gradual decline in inflation may pose risks to financial stability, particularly in developing economies characterized by high levels of public and private debt.

In the case of North Macedonia, the banking sector constitutes approximately 79% of the overall financial system. Therefore, the stability of banks is inherently linked to the stability of the broader financial system and the country's macroeconomic environment. Within this framework, bank deposits are of strategic importance. They are a primary source of funding for banks and are essential for maintaining liquidity and overall operational stability. However, the level of bank deposits is influenced by a wide range of macroeconomic factors, including interest rates, gross domestic product (GDP), inflation, unemployment, remittance inflows, and the orientation of fiscal and monetary policies.

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Moreover, in the context of increasing political uncertainty in various regions, individuals are facing growing unpredictability regarding key aspects of their economic decisions, such as consumption, saving, and investment. This uncertainty tends to influence not only individual financial behavior but also the broader stability of financial institutions.

In such a dynamic and uncertain global economic environment, where macroeconomic variables significantly affect deposit behavior, understanding the nature of these relationships is essential for the formulation of effective and responsive monetary and financial policies.

This study aims to examine the impact of selected macroeconomic factors on the level of bank deposits in North Macedonia. Specifically, it investigates how variables such as deposit interest rates, inflation, unemployment, and GDP influence deposit behavior. A deeper understanding of these relationships is essential for policymakers and financial institutions in developing strategies that enhance economic resilience and safeguard financial system stability.

Higher interest rates are widely recognized as one of the most important and influential factors affecting the level of savings in an economy. The higher these rates are, the stronger the population's inclination to save. This is because higher interest rates increase the expected return on savings, making savings a more attractive option for individuals.

Inflation is generally associated with a decline in purchasing power, which leads individuals to shift their investments toward alternatives other than holding money. Therefore, in this study we began with the hypothesis that inflation has a negative impact on the level of bank deposits. However, in certain cases inflation may also have a positive effect on deposit levels—specifically when rising inflation is accompanied by an increase in deposit interest rates offered by banks. In such situations, individuals are attracted by higher interest returns and choose to place their savings in the form of bank deposits.

Unemployment also represents an important factor influencing the level of bank savings. Individuals who are unemployed and do not generate income are generally unable to save at all. Higher unemployment rates within a country tend to result in lower levels of bank deposits, which in turn reduce the banking sector's capacity to extend credit. Consequently, this leads to slower economic growth.

Economic growth is measured by gross domestic product (GDP), and if it increases, both individuals and businesses typically experience higher income levels. Higher income enhances the capacity to save, leading to an increase in the volume of bank deposits. Additionally, expanding economies often stimulate greater lending and investment activities by banks, which rely on deposit accumulation as a primary source of funding. In cases where deposit interest rates are not highly attractive to the public, even in the context of economic growth, individuals often choose to invest their funds in alternative, more profitable instruments rather than keeping them in bank deposits.

LITERATURE REVIEW

Numerous empirical studies have explored the influence of macroeconomic indicators on economic growth and financial development. Fluctuations in these indicators whether increases or declines may have significant positive or negative effects on the willingness of individuals and businesses to retain their wealth within the banking system.

Name of the authors	Topic	Findings
Jolevski.L & Dimevski (2024)	The macroeconomic factors affecting bank household deposits: case of the Republic of North Macedonia	The average net-income growth has a positive effect on households' deposits, but GDP growth rate and unemployment rate don't have a statistically significant effect on households' deposits
Njenga.L (2024)	Effect of selected macroeconomic variables on deposit levels of savings and credit cooperatives	Economic growth and interest rates on deposits had a significant direct impact on the level of deposits. Inflation had a significant negative impact on the level of deposits.

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Kelmendi. V (2024)	Impact of Macroeconomic Factors on Bank Financial Performance: A Turkey and Kosovo Comparative Study	Based on the comparison, they conclude that inflation, GDP, and exchange rate significantly influence the financial performance of banking companies in both Turkey and Kosovo.
Saygin.C & Puci.J (2023)	An empirical examination of bank deposit rate: the case of Western Balkans	This study concludes that population growth, GDP per capita, and the liquidity ratio are the main determinants of the deposit rate level. Among them, the liquidity ratio has a negative impact on deposit levels. Non-performing loans and inflation rates have no effect on deposit rates.
Cekrezi.A (2022)	Determinants of bank deposits in Albania	This study shows that factors such as the capital adequacy ratio and remittances have a negative and significant impact on bank deposits, while return on assets (ROA) has a positive and significant effect. The impact of GDP and population growth was found to be statistically insignificant.
Youssef et.al (2022)	The Impact of Interest and Inflation Rates on Deposits Behavior of Banks: The Case of Egypt	Positive relationship between inflation rate volatility and the behavior of deposits in both local and foreign currencies.
Johnny.R and Prince.C (2020)	Macroeconomic drivers of bank deposits	Macroeconomic factors such as interest rates, inflation, unemployment rates, economic growth, exchange rates, and government policies play an essential role in shaping bank deposit behavior.
Yakubu.I & Abokor. A (2020)	Factors determining bank deposit growth in Turkey: an empirical analysis	The results reveal that bank stability, banking sector efficiency, broad money supply, economic growth, and inflation are significant determinants of deposit growth in the long run. The findings further show that in the short run, only branch expansion and broad money supply are relevant for bank deposit mobilization.
Morina.F and Osmani. R (2019)	The impact of macroeconomic factors on the level of deposits in the banking sector, an empirical analysis in the Western Balkan countries	Inflation is an insignificant factor in relation to the level of deposits, whereas the other variables—deposit interest rates, GDP, and money in circulation—have a significant positive impact on the level of deposits

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Hailu.T (2024)	Macroeconomic Factors Influencing Deposit Mobilization of Commercial Banks	The results indicate that both inflation and the monetary supply (measured by the M2/GDP ratio) exert a statistically significant negative effect on deposit mobilization. Furthermore, the investment deposit ratio also demonstrates a notable negative relationship with deposit mobilization. Conversely, GDP per capita shows a marginally significant positive correlation with deposit mobilization.

Based on the analyzed studies, it is evident that different authors have examined various variables as factors influencing economic growth. In this research, we will focus only on the variables that we have also taken into consideration during the development of this paper.

One of the main factors commonly analyzed in relation to the level of bank deposits is GDP. Authors such as Yakubu & Abokor (2020), Njenga (2024), Hailu (2024), and Morina & Osmani (2019) reach a common conclusion that GDP has a positive and significant impact on the level of deposits. On the other hand, authors such as Jolevski & Dimevski (2024) and Cekrezi (2022) conclude that GDP does not have a statistically significant effect on deposit levels.

Another variable analyzed in this study as a factor influencing the level of bank deposits is the inflation rate. Authors such as Njenga (2024), Hailu (2024), and Yakubu (2020) conclude that inflation has a negative impact on the level of deposits. In contrast, Youssef et al. (2022) find that inflation has a positive impact on deposit levels. Meanwhile, authors such as Saygin & Puci (2023) and Morina & Osmani (2019) conclude that inflation does not have a significant effect.

The deposit interest rate is also considered in this study as a factor that has a positive impact on the level of deposits. Based on the reviewed studies, Njenga (2024), Morina & Osmani (2019), and Johnny & Prince (2020) conclude that interest rates have a positive and significant effect on deposit levels.

Regarding unemployment as a variable, the authors Jolevski L. & Dimevski (2024) have concluded that unemployment does not have a statistically significant effect on economic growth.

METHODOLOGY

Research methodology in this study is based on the empirical approach. The analysis focuses on how macroeconomic factors as inflation, interest rates on deposits, GDP, and unemployment, impact the level of the bank deposits in the banks in the Republic of North Macedonia. The empirical framework is based on multiple linear regression model which numerically describes the relationship between the predictor variables and the response variable.

This study analyzes secondary data taken from official and publicly available sources as National Bank of North Macedonia (NBRM) and the State Statistical Office (MAKSTAT). The data are analyzed with the help of the statistical program SPSS26.

The period analyzed in this study is for the last 10 years from 2015 until 2024. The data are taken quarterly, so here we have the total number of 40 observations for each variable included in the data set.

The dependent variable in this study is the aggregated level of the deposits held in the banking system. In this paper it is calculated in the natural logarithm of total bank deposits. The independent variables are: the inflation rate, the interest rates on deposits, GDP, and the unemployment rate.

These variables were chosen based on their theoretical relevance and empirical use in prior studies (Yakubu & Abokor, 2020; Njenga, 2024; Morina & Osmani, 2019), which identify them as the main macroeconomic factors influencing deposit behavior.

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The formula of the linear regression model in this case is:

$\ln(DEP_t)=\beta_0+\beta_1 INF_t+\beta_2 IR_t+\beta_3 GDP_t+\beta_4 UNEMP_t+\varepsilon_t$

where:

- $\ln(DEP_t)$ is the natural logarithm of bank deposits at time *t*,
- INFt, IIRt, GDPt, and UNEMPt represent the independent variables, and
- ε_t is the stochastic error term capturing unobserved factors.

Table 1: Description of the study variables

Variables	Calculation	Source
Bank deposits	Natural logarithm of bank deposits	NBRM
Inflation	((Current Price Index - Previous Price Index) / Previous Price Index) x 100	MAK STAT
Interest rates on deposits		NBRM
GDP	GDP = C + I + G + NX	MAK STAT
Unemployment rate	Unemployment rate=Unemployed people/Total labor force×100	MAK STAT

Based on mentioned above variables we have four basic hypotheses:

1. Interest rates on deposits have a positive impact on the level of deposits.
2. Inflation rates have a negative impact on the level of deposits.
3. GDP has a positive impact on the level of deposits.
4. Unemployment has e negative impact on the level of deposits.

RESULTS AND DISCUSSION

After we have analyzed the theory and the empirical analysis from other researchers, in this section we will present the empirical findings derived from multiple linear regression model. The multiple linear regression model in this case analyzes the impact of the independent variables as inflation, interest rates on deposit, GDP, and unemployment, on the level of bank deposits.

Table 2: Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.987[a]	.975	.972	.035837039629011	.682

a. Predictors: (Constant), Unemployment rate, GDP, inflation, i for savings

b. Dependent Variable: SAVINGS

Source: Author's calculations

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Vol. 55 No. 1 January 2026, pp. 163-172

From the table we can see that the model has high explanatory power, where the value of R^2 is 97,5%. This value shows that 97,5% of the changes in the value of the level of deposits in banks in the Republic of North Macedonia are explained by the independent variables analyzed in this study.

The level of 97,2% of the Adjusted R Square also confirms the model sustainability with the predictors that are taken into consideration in this model.

The Durbin–Watson statistic (DW = 0.682) indicates mild positive autocorrelation; however, because all coefficients remain stable and statistically significant, this does not compromise the validity of the results.

Table 3: Pearson correlation matrix

Correlations

		SAVINGS	inflation	i for savings	GDP	Unemployment rate
Pearson Correlation	SAVINGS	1.000	.588	-.451	-.021	-.975
	inflation	.588	1.000	-.491	.042	-.570
	i for savings	-.451	-.491	1.000	.116	.575
	GDP	-.021	.042	.116	1.000	.052
	Unemployment rate	-.975	-.570	.575	.052	1.000
Sig. (1-tailed)	SAVINGS	.	.000	.002	.448	.000
	inflation	.000	.	.001	.399	.000
	i for savings	.002	.001	.	.237	.000
	GDP	.448	.399	.237	.	.374
	Unemployment rate	.000	.000	.000	.374	.
N	SAVINGS	40	40	40	40	40
	inflation	40	40	40	40	40
	i for savings	40	40	40	40	40
	GDP	40	40	40	40	40
	Unemployment rate	40	40	40	40	40

Source: Author's calculations

To test for multicollinearity among the variables, a correlation analysis was also conducted. The Pearson Correlation Matrix is one of the most important tools for examining the relationships between variables and assessing the validity of the regression model. This analysis shows that savings are positively correlated with inflation and negatively correlated with the unemployment rate. From this, it can be concluded that an increase in the price level would lead individuals to increase their savings.
On the other hand, high levels of unemployment reduce the amount of savings made by the population in the country.

The Pearson Correlation between GDP and savings is -0,021, which shows weak relationship between GDP and savings. Also the significance level for this relation is p=0.448, which means that the relation between these two variables is unsignificant.
The correlation between the independent variables is moderate and below the critical threshold of 0.8, confirming that the model does not suffer from the problem of multicollinearity.

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https://ijpsat.org/
Vol. 55 No. 1 January 2026, pp. 163-172

Table 4: Regression output

Variable	Coefficient (B)	Std. Error	t-stat	p-value	Significance	Relationship
Constant	13.640	0.033	414.971	0.000	***	—
Inflation (INF)	0.004	0.002	2.694	0.011	**	Positive
Deposit Interest Rate (IR)	0.085	0.016	5.479	0.000	***	Positive
GDP	0.000	0.001	0.270	0.789	n.s.	Insignificant
Unemployment (UNEMP)	–0.048	0.002	–28.906	0.000	***	Negative

Significance levels: *** $p < 0.01$; ** $p < 0.05$; n.s. = not statistically significant

Source: Author's calculations

In the previous table are presented the results about the coefficients from the regression.

Although theory predicts a negative impact of inflation on the level of bank deposits, in the Republic of North Macedonia inflation as an independent analyzed variable has a positive and significant impact on the level of the bank deposits. This theory is aligned with the study of Youseff et al.(2022), but is in contrast with the study of Yakubu & Abokor (2020).

The other independent variable analyzed in this study is the interest rate on deposits. It has a highly positive and significant impact on the level of the bank deposit. If the interest rate rises for 1% we will have a rise also in the level of bank deposits for 0,085%. This result confirms the theory that when there are higher returns it stimulates savings behavior. These results are aligned with the findings from the research of Morina & Osmani (2019) and Njenga (2024).

From the theory we expect that the higher the GDP in one country the higher should be the level of the deposits. But, in this case, the independent variable GDP doesn't have a significant impact on the level of the bank deposits. These results are *aligned with* the findings of Cekrezi (2022 — Albania) and Jolevski & Dimevski (2024 — North Macedonia).

The last analyzed variable is the unemployment rate. In this case the results are aligned with the theory. The level of unemployment has a negative and significant effect on the level at deposits. In cases where we have a rise of 1% in the level of

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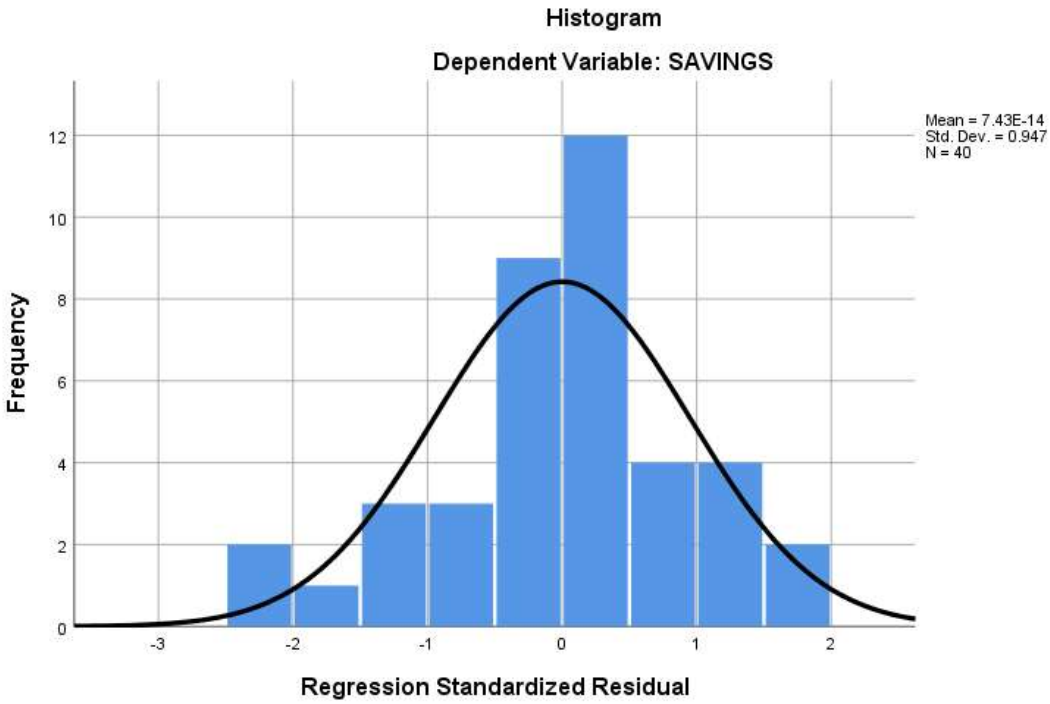
https://ijpsat.org/
Vol. 55 No. 1 January 2026, pp. 163-172

unemployment, the level of deposits in banks declines for 0.048%. **Figure 1: Histogram of Residuals**

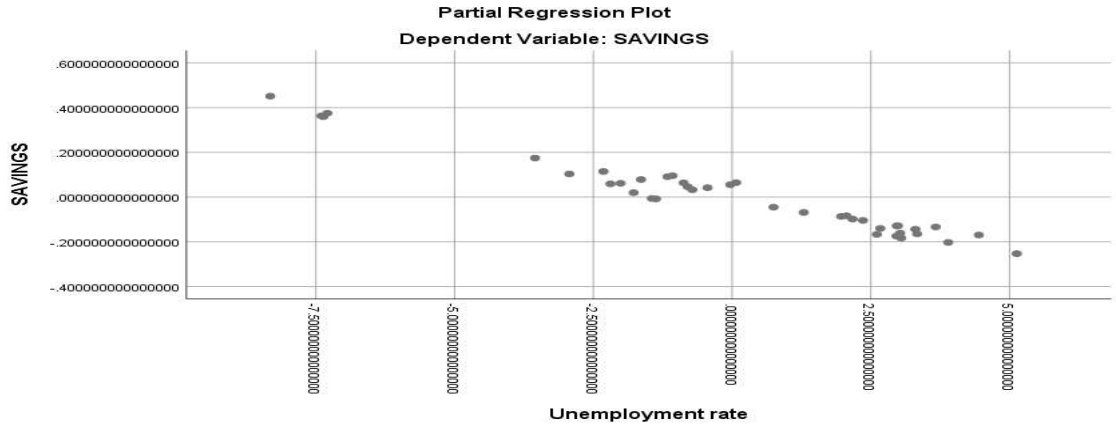


Source: Author's calculations

The histogram of standardized residuals (Figure 1) indicates that in the sample of 40 observations of the dependent variable, in this case the savings, are approximately normally distributed, with a mean value close to zero (Mean = 7.43E–14) and a standard deviation of 0.947.

The distribution resembles the normal bell curve, suggesting that the assumption of normality is satisfied. Therefore, the regression estimates can be considered reliable and unbiased under the OLS framework.

Figure 2: P-P Plot of Standardized Residuals



Source: Author's calculations

The previous figure shows the partial regression plots between savings and the unemployment rate. It shows the clear effect of unemployment on the level of savings. From the figure we can see that as the level of unemployment rises there is a decrease in the level of savings, in cases when there are no other variables taken into consideration.

CONCLUSION

The main objective of this study was to empirically analyze the impact of the macroeconomic factors on the level of the bank deposits in the Republic of North Macedonia, for a period of ten years from 2015 until 2024.

The data are analyzed using the multiple regression analysis. From the data analyzed we come to the following conclusions:

- Inflation has a positive and significant impact on the level of the bank deposits
- Interest rates on deposits have a positive and significant impact on the level of bank deposits
- GDP doesn't have a significant impact on the level of the deposits.
- Unemployment has a negative and significant impact on the level of the deposits.

These findings align with some studies that are taken into consideration in this study. From the policymaking aspect we see that is important to have stable interest rates on deposits, and also is important to promote job creation because it creates trust from the citizens, and encourages their tendency to save within the banking system. GDP was not a significant predictor, suggesting that bank deposit dynamics in North Macedonia are driven primarily by monetary and labor market conditions rather than general economic growth.

The limitations of this study are that the data may vary across the banks and the depositors' segments. This study analyzes the data at macro level, but also is important to analyze this on the micro level taking the data within the banks in order to have more specific conclusions about the depositor's behavior.

In conclusion we can say that from the analyzed variables interest rates of the deposits and inflation have positive and significant impact on the level of the deposits, and unemployment rate has a negative impact on the level of deposits.

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