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DRIVERS OF DEPOSIT GROWTH IN NORTH MACEDONIA: AN EMPIRICAL STUDY

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Abstract

This article seeks to examine the influence of bank-specific variables and macroeconomic factors on the growth of bank deposits in the Republic of North Macedonia.

The study employed the Autoregressive Distributed Lag (ARDL) bounds testing approach, using quarterly data from 2006Q1 to 2024Q1. The empirical results confirm the presence of cointegration among the variables. Furthermore, the analysis indicates that loans, remittances, and foreign exchange reserves have a statistically significant impact on deposit growth. On the other hand, the real change in GDP, weighted interest rates on deposits, CPI and the real change in net salaries do not result in a statistically significant change in deposits, in either the short or long term.

These findings have significant policy implications for decision-makers involved in monetary policy planning, especially in North Macedonia. Additionally, these results may provide valuable insights for other researchers interested in conducting further studies on this topic.

Keywords: total deposits, total loans, remittances, foreign exchange reserves, ARDL bounds testing approach
JEL classification: E5, E51, F24, E59, C32

1. INTRODUCTION

Most of the money in the modern economy is in the form of bank deposits. As a result, any increase in deposits tends to attract the attention of researchers.

Economic theory has featured diverse opinions on the money creation process since its inception. One approach, based on the concept of the money multiplier, views money as being determined by monetary authorities via changes in the monetary base. In line with monetarists and Friedman’s theory of money (Friedman and Schwartz, 1963, 1982), the bank lends funds that clients had previously deposited physically. Once a loan is approved, it generates an entry on the deposit obligation. Bank money is created during this process when the bank transfers the existing physical cash deposits to clients. Known as "deposits creating loans," this process aligns with an *exogenous view of the money supply*.

However, the modern theory of money challenges the notion that monetary authorities independently control the money supply and emphasizes the active role of commercial banks in creating money. In the modern monetarist view of bank money creation, when the bank grants a loan to a client, it credits the client's account with an amount equal to the loan size. This process creates bank money, without the need for physical cash in the accounting process. Known as "loans create deposits" this process aligns with an *endogenous approach to the money creation process* (McLeay et al., 2014a & 2014b).

In brief, the authors favoring the exogeneity view believe that changes in the money supply determine variables such as the price level, interest rates, or real output. On the other hand, the authors holding the endogeneity view argue that the money supply is influenced by these same factors. The endogenous money approach has seen increasing support in macroeconomics.

Considering all of this, identifying the factors driving changes in deposits proves to be challenging.

The aim of this study is to to understand the trends in deposit growth, specifically in the Republic of North Macedonia. This study examines the underlying reasons for the increase in deposits in recent years.

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This study enhances the literature by offering two distinct contributions. First, as far as we are aware, no empirical study has examined the reasons behind deposit growth in the Macedonian economy. As a result, this research presents pioneering work in this area. The results of this study provide value to banks, policymakers, and researchers by: informing banks (both commercial banks and the Central Bank) of the factors influencing deposit growth; providing policymakers with insights into macroeconomic factors that drive deposit growth; and enhancing researchers' understanding by exploring the relationship between bank deposits and various factors. Secondly, we break down the factors influencing deposit growth into short- and long-run determinants through the Autoregressive Distributed Lag (ARDL) model.

The structure of the paper is outlined as follows: In Section 2, we provide stylized facts about deposit growth and monetary policy in North Macedonia. Section 3 provides a literature review of relevant studies. The Methodology, data analysis and empirical model of the study are presented in Sections 4. In Section 5 we discuss the empirical results. Finally, section 6 presents the concluding remarks from the research performed.

2. STYLIZED FACTS ABOUT DEPOSIT GROWTH AND MONETARY POLICY IN NORTH MACEDONIA

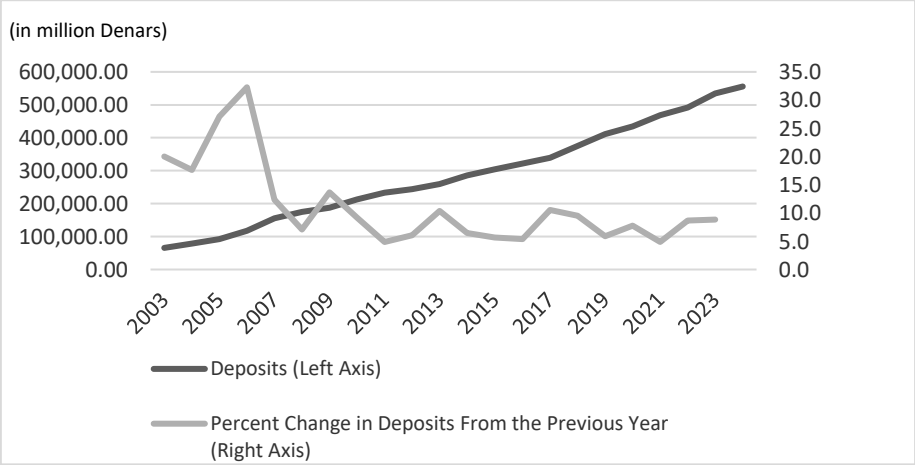
The Republic of North Macedonia is a small, open economy marked by low and stable inflation, typically ranging from 2% to 3%. However, between 2021 and 2023, inflation surged dramatically, reaching nearly 20%, driven by a series of crises, including the COVID-19 pandemic, the energy crisis, and the war in Ukraine. Despite this, the country has seen a recent decline in unemployment. Furthermore, a key aspect of the Macedonian economy is the substantial inflow of remittances, which constitute a significant portion of the total foreign exchange inflows in the country's balance of payments and play a crucial role in supporting foreign exchange reserves and maintaining exchange rate stability.

The Macedonian banking system is characterized by low degree of international financial integration, a simple structure of financial instruments, a consistent increase in loan demand from both households and firms.

Given that the Republic of North Macedonia operates under a fixed exchange rate regime, the monetary base is primarily influenced by the foreign exchange interventions of the NBRNM, aimed at defending the exchange rate, irrespective of lending.

In recent years, deposits in North Macedonia have experienced strong growth, with an average growth rate of 11.28 percent between 2004 and 2023. In comparison, nominal GDP growth during the same period was 5.9 percent. The factors driving bank deposits in Macedonia are worth exploring, especially considering the impact of bank deposits on economic growth.

Figure 1: Total Deposits and Year-Over-Year Change in Deposits in the Republic of North Macedonia



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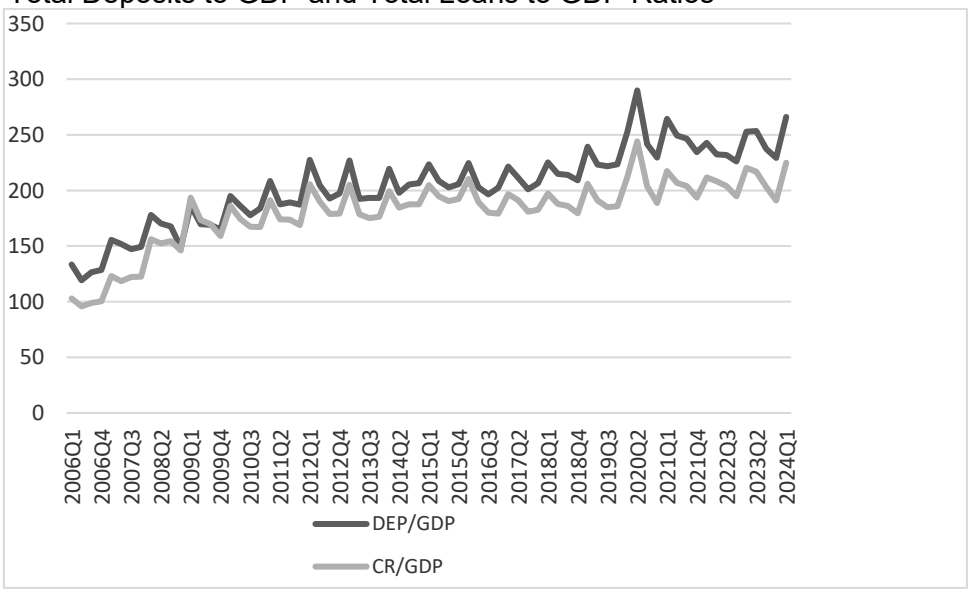
Source: www.nbrm.mk and Author's calculation

The increase in deposit balances was driven by changes in consumer behavior, fiscal and monetary responses following the Great Financial Crisis (GFC), the COVID-19 pandemic, the global energy crisis (2021-2023), political instability, a higher personal savings rate, and other factors. As shown in Figure 2, the ratio of total deposits to nominal GDP increased from 133% in 2006:Q1 to 290% in 2020:Q2, than declined and continued to hovered around 230%.

Figure 2: Total Deposits to GDP and Total Loans to GDP Ratios



Source: www.nbrm.mk and Author's calculation

In the years leading up to the Great Financial Crisis (GFC), alongside the rise in the ratio of bank credit to GDP, the ratio of deposits to nominal GDP also increased. Following the GFC, the deposits-to-GDP ratio continued to rise, partly due to the expansion of banks' balance sheets, driven by both the increase in reserves and credit within the banking system. Additionally, banks, in response to new liquidity regulations, sought to hold more stable forms of funding, including deposits. After the onset of the COVID-19 pandemic in 2020, the deposits-to-GDP ratio surged to over 290 percent, than declined and continued to hovered around 230-260%.

During this period, the Macedonian economy faced high core and headline inflation.

The NBRNM's policy response involved several measures, starting with interventions in the foreign exchange market, which helped manage liquidity in circulation (selling foreign exchange reserves led to the creation of deposits). The policy response then shifted to raising interest rates, not only on the basic interest rate but also on overnight loans, overnight deposits, and seven-day deposits. Additionally, the NBRNM adjusted the mandatory reserve requirement multiple times and implemented other measures aimed at gradually tightening monetary policy. For instance, a countercyclical protective layer was introduced. Furthermore, changes to the reserve requirement were made to signal to banks to adjust their interest rate policies, encouraging them to offer more favorable interest rates on denar savings. The increase in interest rates on bank deposits was thus a direct response to central bank measures.

Other significant macroeconomic trends during the period included the growth of private transfers (especially the rise in net inflows in the foreign exchange market) and the growth of net salaries.

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3. LITERATURE REVIEW

Various scholars have sought to understand the growth of bank deposits by analyzing the factors that drive it.

Johnny, R. and Prince, C. (2020) explained the key macroeconomic drivers of bank deposits, including interest rates, inflation, unemployment rates, economic growth, exchange rates, and government policies. Their findings suggest that while some factors, such as interest rates and inflation, have a clear and direct impact on deposit levels, others, like government policies and exchange rates, may exert more complex effects. Additionally, the unemployment rate, economic growth, and GDP also influence deposit levels.

According to the review of the analyzed literature, researches in this area have not been found in Macedonian literature. Additionally, the number of research on this topic for European emerging economies is limited.

Using Ordinary Least Squares (OLS) methodology, Corovei and Socol (2019) examined the potential impact of macroeconomic indicators on the deposit growth rate in the Eurozone from January 2003 to June 2019. The authors conducted specific tests for multicollinearity and stationarity and incorporated robust standard errors to address heteroskedasticity in their panel data. The macroeconomic variables included in their analysis were: GDP annual growth rate, inflation rate, harmonized unemployment rate, interest deposit rate for deposits with a maturity of less than one year, interest deposit rate for deposits with a maturity greater than one-year, short-term debt securities, long-term debt securities, and listed shares. The authors concluded that, except for the unemployment rate, all the other variables positively influenced the growth rate of household deposits.

Nguyen (2022) examined the impact of institutional quality on bank deposit growth, alongside bank-specific and macroeconomic variables, in European transition economies. The author employed the Generalized Method of Moments (GMM) to analyze panel data covering the period from 2000 to 2017. The results indicate that institutional quality enhances the positive effect of deposit mobilization on bank deposit growth. More specifically, the rule of law was found to have a positive correlation with bank deposits. Additionally, macroeconomic factors such as broad money supply (M2) and economic growth (rGDP) were identified as significant drivers of bank deposit growth. Furthermore, bank-specific factors, including bank efficiency and branch expansion, were found to have no influence on bank deposit growth.

Yakubu and Abokor (2020) used quarterly data from 2000 to 2016 on the Turkish banking system to examine the relationship between bank deposits and six explanatory variables, including bank stability, bank efficiency, branch expansion, broad money supply, GDP growth, and inflation. Their analysis revealed that the GDP growth rate had a negative and statistically significant effect on deposit growth, while the inflation rate had a positive and statistically significant impact on bank deposit growth.

There is also a literature focused on the empirical analysis of deposit growth in the USA. Using VAR and VECM methodologies, Matteo and Enrico (2017) conducted an analysis of the United States from 1959 to 2016, testing several propositions of the endogenous money theory. Specifically, they demonstrated that in the United States during this period, bank loans influence bank deposits, which, in turn, determine the monetary base.

It is important to note that while reviewing the available literature in this area, we came across a large number of studies that analyze the impact of various factors money supply, exchange rates, inflation rates, deposit interest rates, GDP growth, bank investment, the number of bank branches) on deposit levels in Asian countries such as Ethiopia (Tenaw, 2020), Ghana (Ngula, 2012; Larbi-Siaw and Lawer, 2015), Zimbabwe (Mashamba et al. ,2014), Nigeria (Eriemo, 2014), etc. Due to the distinct characteristics of the banking system and economic conditions, this group of countries does not serve as a benchmark for the Macedonian economy, although their findings still provide valuable explanatory insights.

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Focusing on the Republic of North Macedonia, this study strives to close this gap by integrating both bank-specific and macroeconomic factors into a single model to examine the factors affecting bank deposit growth in North Macedonia.

4. METHODOLOGY

In this research, we apply the ARDL model to investigate the impact of the total loans of the non-government sector (CR), remittances (REM), foreign exchange reserves (FR), economic growth (RGDP), weighted interest rates on deposits (IR), consumer price index (CPI), and the real change in net salaries (RSAL) on total deposits growth (DEP) in the Republic of North Macedonia in the long-run. After establishing cointegration, we proceed to estimate the error correction model (ECM), often referred to as the short-run model. The ARDL procedure involves two key steps: examining stationarity and cointegration.

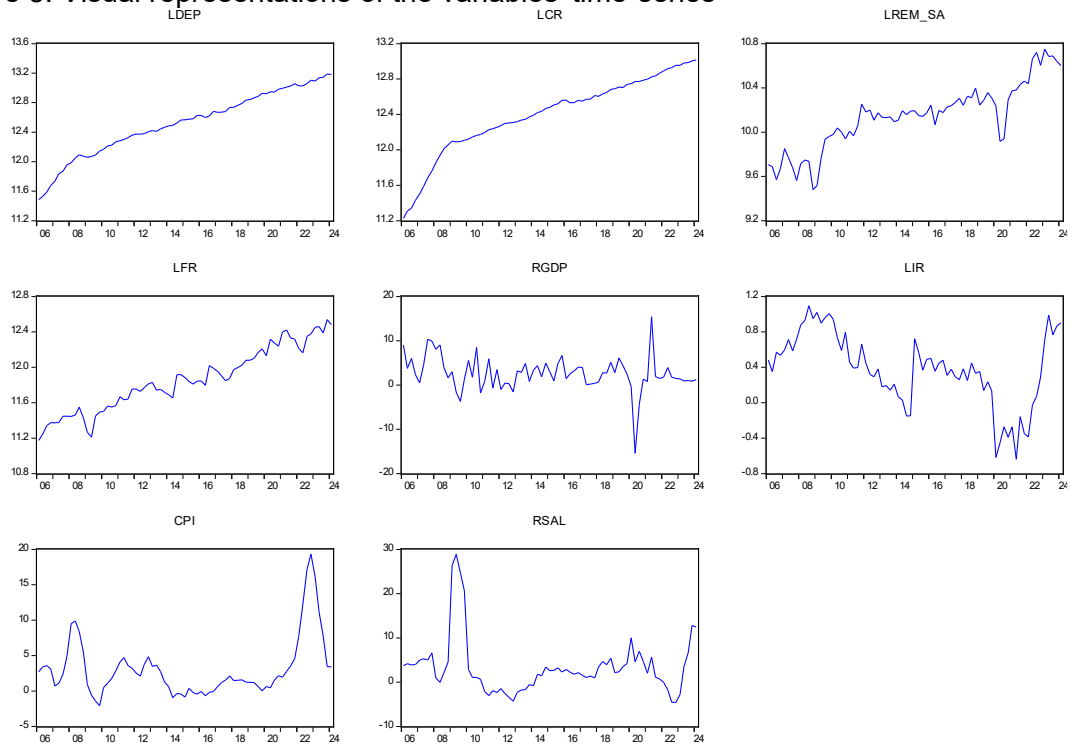
4.1. *Preliminary data analysis*

The variables' data are quarterly, covering the period from 2006Q1 to 2024Q1. We obtain the data on total deposits, total loans, remittances, foreign exchange reserves, economic growth, weighted interest rates on deposits, consumer price index, and the real change in net salaries from The National Bank of The Republic of North Macedonia (2024a, 2024b, 2024c) database. Total deposits (DEP), total loans (CR), remittances (REM) and foreign exchange reserves (FR) are in million Denars. Economic growth (RGDP), weighted interest rates on deposits (IR), consumer price index (CPI), and the real change in net salaries (RSAL) are in %. The Eviews 10 software is used to generate all of the empirical results and graphs.

The time series of remittances are seasonally adjusted. Since all variables, (except, economic growth, consumer price index and the real change in net salaries) take on positive values, they are expressed in logarithmic form.

We begin our empirical analysis by visual representations of the variables' time-series (Figure 3) to assess their time series properties, as ensuring stationarity is essential to avoid spurious results.

Figure 3: Visual representations of the variables' time-series



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Visual examination of time series plots reveals that most variables are non-stationary due to their trends and changing levels, i.e. they exhibit unit roots, meaning they are not of order one integration, and therefore not stationary at the levels. Only series RGDP seems as potential stationary series. Even thought the series (RGDP) has a strong cycles. These cycles are aperiodic, meaning that they do not repeat at regular intervals. Figure 3 illustrates that the variables experience structural breaks at various periods. As highlighted in Perron (1989), it is crucial to consider this situation when performing unit root tests to avoid drawing incorrect conclusions. The statistics of the variables employed in the study are summarized in Table 1.

Table 1: Descriptive statistics

	LDEP	LCR	LREM_SA	LFR	RGDP	LIR	CPI	RSAL
Mean	12.51840	12.39581	10.13826	11.85393	2.594215	0.379763	3.088713	3.311355
Median	12.56773	12.47975	10.17485	11.83987	2.332818	0.384227	1.964697	2.245355
Maximum	13.18860	13.01534	10.74972	12.53938	15.41255	1.095113	19.34858	28.91171
Minimum	11.48470	11.22398	9.480711	11.17327	-15.41616	-0.640599	-2.100000	-4.568237
Std. Dev.	0.434718	0.435070	0.301054	0.358554	3.911245	0.412804	4.176586	6.358817
Skewness	-0.442033	-0.840449	-0.125139	0.094475	-0.637228	-0.480292	2.037787	2.291761
Kurtosis	2.462740	3.268155	2.690420	2.066149	9.076909	2.789294	7.346783	9.060199
Jarque-Bera	3.255256	8.812698	0.482040	2.761164	117.2655	2.941658	107.9938	175.6097
Probability	0.196395	0.012200	0.785826	0.251432	0.000000	0.229735	0.000000	0.000000
Sum	913.8432	904.8942	740.0933	865.3366	189.3777	27.72272	225.4761	241.7289
Sum Sq. Dev.	13.60654	13.62856	6.525614	9.256367	1101.444	12.26928	1255.959	2911.288
Observations	73	73	73	73	73	73	73	73

According to Table 1, all the variables have positive mean values. In addition, the volatility, as indicated by the standard deviation, is greater for RGDP, CPI, and RSAL than for the other variables. The JB-test outcomes reveal that, except for RGDP, CPI, and RSAL, all variables are normally distributed.

4.2. *Empirical model*

This research focuses on analyzing the short-run and long-run impacts of loans, remittances, foreign exchange reserves, economic growth, weighted interest rates on deposits, consumer price index, and the real change in net salaries on total deposits growth in the Republic of North Macedonia, by using the quarterly data over the period of 2006 – 2024.

Firstly, we establish the long-run model of total deposits growth. Using the seasonally adjusted and logarithmic values of the variables as it was explained before, we present the long-run model of total deposits growth as follows:

$$LDEP_t = \alpha_0 + \beta_1 LCR_t + \beta_2 LREM\_SA_t + \beta_3 LFR_t + \beta_4 RGDP_t + \beta_5 LIR_t + \beta_6 CPI_t + \beta_7 RSAL_t + u_t \quad (1)$$

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where all factor proxies have been defined earlier, except for *u*, that represents the error term. *t* denotes the study period, and α_0 represents the intercept. The coefficients β_1 to β_7 represent the explanatory factors in the model.

4.3. *Stationarity and cointegration*

The initial step in the ARDL analysis involves performing a unit root test. For the ARDL Bounds testing approach to be applicable to cointegration, each variable must be I(0) or I(1), and not I(2). We test the integration order of the variables through traditional unit root tests, including the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests (Table 2). The null hypothesis for both tests states that the variables are non-stationary and contain a unit root. If the test statistic exceeds the critical value, we reject the null hypothesis of non-stationarity.

Table 2: Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests

At Level								
Intercept					Trend and Intercept			
Variable	ADF		PP		ADF		PP	
	t-Statistic	Probability	t-Statistic	Probability	t-Statistic	Probability	t-Statistic	Probability
LDEP	-1.3552	0.5988	-3.9960*	0.0025	-3.2451***	0.0852	-7.7683*	0.0000
LCR	-1.6880	0.4327	-4.5217*	0.0004	-6.0931*	0.0000	-5.1757*	0.0003
LREM_SA	-1.4692	0.5435	-1.0555	0.7289	-3.4964**	0.0473	-3.4897**	0.0481
LFR	-0.1858	0.9346	-0.8614	0.7949	-4.5291*	0.0027	-4.5291*	0.0027
RGDP	-5.3359*	0.0000	-6.1750*	0.0000	-5.7968*	0.0000	-6.3030*	0.0000
LIR	-2.0917	0.2486	-2.0731	0.2560	-2.0848	0.5452	-2.1391	0.5154
CPI	-2.0944	0.2476	-2.6329***	0.0912	-2.1721	0.4968	-2.7086	0.2365
RSAL	-2.8820***	0.0528	-3.0812**	0.0325	-2.8487	0.1857	-3.0370	0.1296
At Fist difference								
LDEP	-2.9983**	0.0407	-7.0913*	0.0000	-2.7509	0.2209	-7.8122*	0.0000
LCR	-2.9377**	0.0464	-4.1193*	0.0017	-2.8298	0.1921	-5.0376*	0.0005
LREM_SA	-7.7502*	0.0000	-16.0438*	0.0001	-7.6836*	0.0000	-15.8133*	0.0001
LFR	-5.5679*	0.0000	-12.0041*	0.0001	-5.5394*	0.0001	-11.8727*	0.0001
RGDP	-5.8133*	0.0000	-17.7945*	0.0001	-5.8228*	0.0000	-17.6372*	0.0001
LIR	-10.0561*	0.0001	-10.0977*	0.0001	-7.2108*	0.0000	-10.1288*	0.0000
CPI	-3.6557*	0.0070	-4.2887*	0.0010	-4.0732**	0.0109	-4.2613*	0.0061
RSAL	-5.4203*	0.0000	-6.9817*	0.0000	-5.5968*	0.0001	-6.9532*	0.0000

*, **, *** Indicates stationarity at the 1%, 5%, and 10% significance levels, respectively.

As Perron (1989) demonstrated, ignoring structural breaks in time series reduces the ability to reject a unit root when the stationary alternative is valid. Since the time series plots of the variables display structural breaks, and traditional unit root tests fail to account for these breaks, we also employ the two structural breaks unit root tests by Lee and Strazicich (2003) to verify the results of the traditional tests. In the LS unit root tests, the null hypothesis indicates that the series has a unit root with two level breaks. The null hypothesis can be rejected if the computed LS test statistic exceeds the table's critical value.

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Once the necessary conditions for applying the ARDL Bounds approach are met, we move forward with its implementation. The ARDL Bounds approach is an innovative method for linear cointegration, introduced by Pesaran and Pesaran (1997), Pesaran and Smith (1998), Pesaran and Shin (1999), and Pesaran et al. (2001). It offers significant benefits compared to other cointegration approaches, such as, estimation of both short-run and long-run parameters in one model, solves issues of endogeneity, it can assess whether cointegration exists among variables that exhibit different integration orders, such as I(0), I(1), or fractional integration, and finally, it is suitable for small sample sizes (Jebli & Belloumi, 2017) and provides unbiased long-run estimates (Odhiambo, 2008).

The ARDL model is derived as follows:

$$\begin{aligned}\Delta LDEP_t = {} & \alpha_0 + \sum_{i=1}^{n} \alpha_{1i}\,\Delta LDEP_{t-i} + \sum_{i=0}^{n} \alpha_{2i}\,\Delta LCR_{t-i} + \sum_{i=0}^{n} \alpha_{3i}\,\Delta LREM\_SA_{t-i} \\ & + \sum_{i=0}^{n} \alpha_{4i}\,\Delta LFR_{t-i} + \sum_{i=0}^{n} \alpha_{5i}\,\Delta RGDP_{t-i} + \sum_{i=0}^{n} \alpha_{6i}\,\Delta LIR_{t-i} + \sum_{i=0}^{n} \alpha_{7i}\,\Delta CPI_{t-i} \\ & + \sum_{i=0}^{n} \alpha_{8i}\,\Delta RSAL_{t-i} + \delta_1 LDEP_{t-i} + \delta_2 LCR_{t-i} + \delta_3 LREM\_SA_{t-i} + \delta_4 LFR_{t-i} \\ & + \delta_5 RGDP_{t-i} + \delta_6 LIR_{t-i} + \delta_7 CPI_{t-i} + \delta_8 RSAL_{t-i} + \rho ECM_{t-i} + e_t\end{aligned} \tag{2}$$

In this context, Δ represents the difference operator; α_0 is the intercept; α_1 to α_8 are the short-run coefficients, while δ_1 to δ_8 are the long-run coefficients; e_t is the error term; n denotes the optimal lag length of the variables; ρ is the coefficient of the error correction term (ECM); and ECM_{t-1} refers to the error-correction term with one-period lag.

The long-run relationship among the variables is assessed using the F-test in a bound test, where the null hypothesis posits no such relationship, and this hypothesis is tested against the alternative. By utilizing Equation (2), we can derive the subsequent hypothesis.

H_0: $\delta_9 = \delta_{10} = \delta_{11} = \delta_{12} = \delta_{13} = \delta_{14} = \delta_{15} = \delta_{16} = 0$ *(no cointegration)*.
H_1: $\delta_9 \neq \delta_{10} \neq \delta_{11} \neq \delta_{12} \neq \delta_{13} \neq \delta_{14} \neq \delta_{15} \neq \delta_{16} \neq 0$ *(cointegration).*

The outcome of the tests is determined by comparing the computed F-statistic with the lower bound I(0) and upper bound I(1) critical values, as specified by Pesaran et al. (2001). If the calculated F-statistic surpasses the upper I(1) critical value, the null hypothesis is dismissed, indicating cointegration among the variables.

5. EMPIRICAL RESULTS

Based on the unit root test results in Table 2, all variables are stationary at their first difference (I(1)), satisfying the ARDL Bounds testing approach's requirement that variables not be I(2). Additionally, Lee and Strazicich's unit root test results are presented in Table 3. We can conclude that the break dates align with periods of major economic, financial, and political upheavals, or the times following these disturbances, in the Republic of North Macedonia.

Table 3: Lee and Strazicich's (2003) unit root test outcomes, which incorporates two structural breaks.

Level
Two shifts in levels

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Variables	Test Statistics	Lag	1st break date	2nd break date	Critcal value (%5)
LDEP	-6.21*	4	2010Q1	2017Q2	-6.19
LCR	-6.40*	2	2010Q2	2016Q3	-6.18
LREM_SA	-5.46	1	2012Q1	2021Q2	-5.92
LFR	-4.80	8	2012Q4	2019Q4	-6.38
LRGDP	-7.35*	3	2013Q1	2022Q1	-6.15
LIR	-5.24	7	2012Q2	2019Q3	-6.15
CPI	-7.05*	5	2013Q4	2021Q3	-6.15
RSAL	-5.80	4	2008Q3	2010Q2	-6.11
First Difference					
Variables	Test Statistics	Lag	1st break date	2nd break date	Critcal value (%5)
LDEP	-7.02*	8	2015Q2	2021Q3	-6.19
LCR	-7.23*	4	2008Q3	2017Q3	-6.18
LREM_SA	-7.91*	2	2019Q4	2021Q4	-6.11
LFR	-8.10*	1	2019Q2	2021Q4	-6.11
LRGDP	-10.46*	7	2019Q4	2020Q4	-6.11
LIR	-10.16*	0	2008Q3	2009Q3	-6.11
CPI	-8.88*	3	2008Q3	2011Q1	-6.11
RSAL	-12.31*	3	2008Q3	2010Q4	-6.11

* Indicates stationarity at the 5% significance level.

The unit root test results confirm that the highest level of integration for all variables in the study is I(1), so we can proceed with analyzing the presence of cointegration between the variables using this method and we first determine the optimal lag length for the ARDL model based on the Schwarz Information Criterion (SC). According to the results, the ideal lag length is 1. The corresponding ARDL model is ARDL(1, 1, 0, 0, 0, 0, 0, 0) and Table 4 provides the outcomes of the diagnostic tests for this model.

Table 4: The results of diagnostic testing for the ARDL (1, 1, 0, 0, 0, 0, 0, 0) model

Test	Calculated Statistics	Probability
Breusch-Godfrey Autocorrelation	1.1372	0.3275
Breusch-Pagan-Godfrey Test	1.5605	0.1473
Jargue-Bera Test of Normality	1.1229	0.5704
Ramsey RESET Test	0.4630	0.6450
Coefficient Stability Tests		
CUSUM: Stable* CUSUMQ: Stable*		

* Shows statistical significance at the 5% significance level.

Table 4 reveals that the model is free from autocorrelation and heteroscedasticity, the errors are normally distributed, the functional form is properly specified, and the coefficients of the model remain stable.

Table 5 displays the findings from the ARDL Bounds tests. The bounds test has two basic critical values: lower bound I(0) and upper bound I(1); which are used to determine the

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final outcome of the test. The null hypothesis of the test is "H_0: There is no cointegration between the variables". If the F-test statistic obtained from the ARDL test Equation exceeds the upper bound I(1), H_0 is rejected.

Table 5: Results of the ARDL bounds tests

k	F-Statistic	1% Critical Values	
7	5.319239	I(0)	I(1)
		2.17	3.21

Given that the computed test statistic of 5.3192 exceeds the upper bound critical value of 3.21, we reject the null hypothesis of no cointegration and conclude that cointegration exists between LDEP and LCR, LREM_SA, LFR, RGDP, LIR, CPI, and RSAL. The short-run and long-run coefficient estimates are shown in Table 6.

Table 6: Short-run and long-run coefficient estimates

Short-term Coefficients and Error Correction Model				
Variable	Coefficient	Standard Error	t-Statistics	Probability
LDEP(-1)	-0.319050*	0.075744	-4.212223	0.0001
LCR(-1)	0.187420*	0.061842	3.030625	0.0036
LREM_SA	0.039679**	0.017143	2.314639	0.0240
LFR	0.140340*	0.028875	4.860271	0.0000
RGDP	-0.000219	0.000599	-0.365033	0.7163
LIR	-0.003152	0.007205	-0.437433	0.6633
CPI	-0.001240	0.000643	-1.928043	0.0584
RSAL	0.000184	0.000403	0.456177	0.6499
D(LCR)	0.711183*	0.146398	4.857872	0.0000
CointEq(-1)*	-0.319050*	0.043397	-7.351893	0.0000
Long-term Coefficients				
Variable	Coefficient	Standard Error	t-Statistics	Probability
LCR	0.587431*	0.069877	8.406642	0.0000
LREM_SA	0.124366**	0.060522	2.054890	0.0441
LFR	0.439869*	0.068286	6.441529	0.0000
RGDP	-0.000686	0.001893	-0.362346	0.7183
LIR	-0.009878	0.021820	-0.452709	0.6523
CPI	-0.003886	0.002180	-1.782467	0.0796
RSAL	0.000576	0.001263	0.456145	0.6499
C	-1.213361	0.359397	-3.376106	0.0013

*, ** Indicates stationarity at the 1% and 5% significance levels, respectively.

Deposits are determined by a linear function of their own lagged values and the lagged values of other time series.

According to the results in Table 6, the effect of deposits lag value (-1), loans and its lag value (-1), remittances and foreign exchange reserves, on deposits is statistically significant in the short-run. In the long-run, loans, remittances and foreign exchange reserves, have a statistically significant effect on the deposits.

Consistent with the findings of McLeay et al. (2014a, 2014b) and Matteo and Enrico (2017), our results indicate a significant positive effect of loans on deposit growth. This suggests that an increase in loans triggers bank deposit growth, as the approval of a loan creates a matching deposit in the borrower's bank account, effectively creating new money.

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Moreover, our results emphasize a notable positive impact of foreign exchange intervention on deposit growth. This is particularly evident in the Republic of North Macedonia, where foreign exchange reserve interventions play a crucial role in stabilization policies.

In the case of North Macedonia versus Eurozone (Corovei and Socol, 2019) or Turkish economy (Yakubu and Abokor, 2020), the Consumer Price Index (CPI) shows a negative effect on deposit growth, though this result is statistically significant at the 10% level.

Furthermore, economic growth, the weighted interest rates on deposits, and the real change in net salaries do not show a statistically significant effect on deposits, neither in the short term nor in the long term. These results differ from those of Corovei and Socol (2019), Nguyen (2022) and, Yakubu and Abokor (2020), who observed that deposit interest rates and economic growth have positive influence on bank deposit growth.

Based on the long-run elasticity estimates, a 1% increase in the LCR leads to a 0.59% increase in LDEP; a 1% increase in LREM_SA results in a 0.12% increase in LDEP; a 1% increase in LFR leads to a 0.44% increase in LDEP; and a 1% increase in CPI causes a 0.003% decrease in LDEP in the long-run.

In the short-run, a 1% increase in LDEP results in a 0.32% decline in LDEP with a quarter's delay; a 1% increase in LCR leads to a 0.71% and 0.19% increase in LDEP with a quarter's delay; a 1% increase in LREM_SA causes a 0.04% rise in LDEP; a 1% increase in LFR results in a 0.14% increase in LDEP; and a 1% increase in CPI decreases LDEP by 0.001%.

The lag value of the error correction term (ECTt-1), also known as the speed of adjustment term, is found to be negative and statistically significant (-0.319050). This coefficient indicates the speed at which the system returns to equilibrium after a shock in the long-run relationship. Based on the estimated value of the ECTt-1, we can conclude that approximately 31.905% of the deviation from the long-run equilibrium is corrected each quarter, indicating a relatively slow adjustment process.

Table 6 displays the contribution of each factor to deposits. It is worth noting that while these factors explain a significant portion of the variation in deposits, they do not account for the entire variation.

6. CONCLUSION

Identifying the key factors influencing deposit growth is crucial, particularly for the Central Bank to develop effective policies and strategies. This study examines both the short- and long-run determinants of bank deposit growth in the Republic of North Macedonia.

The developments in deposits from the first quarter of 2006 to the first quarter of 2024 were influenced by various factors. The most significant of these were the Central Bank's management of foreign exchange reserves, credit activity of the commercial banks towards households and firms, and growth in remittances, all of which played a key role in driving total deposit growth.

We provide several recommendations based on the findings. First, since commercial banks' lending activities to firms and households, as well as remittances and foreign exchange reserve interventions, significantly influence deposit growth, efforts to strengthen financial stability should combine macroprudential regulation with an acknowledgment of the positive impact that broader access to bank deposits can have on financial stability. Second, considering that the demand for bank loans and remittances are a significant source of money, monetary policies may use foreign exchange reserve interventions as the most effective measure when tends to reduce liquidity in the real economy. This study focuses on one country, and we encourage future studies that considers panel studies and explores additional factors that could impact bank deposits.

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