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Macroeconomic Drivers of Economic Stability: Evidence from North Macedonia

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BALKAN JOURNALS

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Abstract

This paper investigates the macroeconomic drivers of economic stability in North Macedonia by applying a time series econometric framework based on Vector Autoregression (VAR) and Granger causality analysis, covering the period from 2000 to 2023. Key variables include GDP growth, inflation, money supply (M1), interest rate, unemployment, government budget balance, and current account balance. After testing for stationarity using the Augmented Dickey-Fuller (ADF) test, a VAR model with two lags was estimated, followed by Granger causality tests to identify predictive linkages.

The results reveal dynamic interdependencies, showing that monetary aggregates (M1) and fiscal balances significantly influence both GDP and inflation, underscoring the critical role of policy levers. Moreover, labor market conditions and external balances contribute to short-run macroeconomic outcomes. Granger causality tests highlight money supply as a leading indicator, while interest rates show responsiveness to inflation and unemployment, consistent with the Taylor Rule. These findings offer valuable insights into the policy transmission mechanism and provide a basis for improved economic forecasting and macroeconomic management in small open economies.

Keywords: Economic stability, monetary policy, inflation, VAR model, Granger causality, North Macedonia

Introduction

A country's economic stability depends on how well the economy can handle changes, recover from shocks, and create the conditions for steady growth. For North Macedonia, as a small and open economy with strong ties to European markets, this issue is especially important. The country has gone through significant transitions, political, structural, and economic, and today faces both opportunities and challenges as it works toward EU integration. Therefore, this paper focuses on some of the most important pieces of the economic puzzle, such as GDP growth, inflation, unemployment, the government budget, money supply, current account balance, and interest rates.

The selected macroeconomic indicators portray important economic developments of the country. Unemployment data and trends provide a picture of how well the labor market is working, whether people can find jobs, and whether those jobs are stable and productive. Inflation shows whether prices are rising too fast, which affects everyone's cost of living and the value of money. The government's budget balance describes how responsibly public money is being managed, while the money supply indicates the level of liquidity in the economy, how easy it is to borrow, invest, or spend. The current account balance reflects how much the country earns from the rest of the world compared to how much it spends abroad. And interest rates, set by the central bank, are a key tool for influencing economic activity, investment, and inflation. Moreover, these specific indicators have been selected for analysis due to their strong interconnections. A change in one can trigger changes in the others. For example, higher inflation can lead to higher interest rates, which can slow down borrowing and investment, affecting employment and economic growth. By studying these links over time using the official data, this paper tries to uncover what drives economic stability in North Macedonia through an econometric analysis applying the VAR model and the Granger causality test.

Employment is a central pillar of macroeconomic stability, reflecting the capacity of an economy to utilize its labor force productively and inclusively (IMF, 2025). In the context of North Macedonia, employment trends offer crucial insights into the country's structural and cyclical dynamics. Following independence and the transition from a centrally planned to a market-oriented economy, North Macedonia faced severe employment challenges, including deindustrialization, labor market mismatches, and limited private sector dynamism (Mojsoska-Blazevski, 2012). Despite moderate GDP growth in the 2000s and increasing integration with European markets, employment growth remained sluggish for many years, exposing the

weakness of job creation mechanisms and the gap between economic performance and labor absorption.

North Macedonia has experienced a diverse set of macroeconomic challenges over the past three decades, including, fiscal consolidation, inflationary pressures, post-conflict recovery and efforts toward European integration. Thus, understanding the underlying drivers of economic performance and stability and inter dependences among the core macroeconomic indicators is vital for designing effective policy responses.

Literature Review

Over the past years, scholars have devoted considerable attention to understanding the key drivers of economic stability and growth in North Macedonia, often highlighting persistent structural vulnerabilities. For instance, Lazarov and Simeonovski (2023) conclude that output volatility has a significant negative effect on GDP growth, particularly in the short term, underscoring the importance of fostering consistent and sustainable growth over time. However, they find no statistically significant impact of price or fiscal volatility on economic growth, which suggests that inflation fluctuations and fiscal balance instability do not directly hinder growth in the Macedonian context. Interestingly, financial stability, particularly proxied by the capital adequacy ratio, also appears to constrain growth, indicating that overly cautious banking practices may suppress credit activity and thus economic expansion.

The paper by Ameti and Idrizi (2024) investigates the influence of inflation and economic growth on unemployment in the Republic of North Macedonia between 2017 and 2022. The authors find a negative relationship between inflation and unemployment, and similarly, a negative relationship between economic growth and unemployment. These findings are interpreted through the lenses of the Phillips Curve and Okun's Law, suggesting that increases in inflation or GDP growth contribute to reducing unemployment levels. However, the decline in unemployment is also partially attributed to high levels of emigration, especially to Western Europe, which reduces the domestic labor force. The study highlights that while certain macroeconomic policies, such as self-employment support and employment subsidies, have shown some effectiveness, the overall economic structure remains fragile. Limited foreign investment, a large informal economy, and persistent policy inefficiencies continue to hinder stability. The authors emphasize that achiev-

ing sustainable development requires a combination of inflation control, economic growth stimulation, and more effective labor market interventions.

Dauti (2024) investigates the impact of fiscal policy on economic growth in North Macedonia, focusing on the effects of government expenditure and taxation. Using annual data from 2000 to 2021 and applying an autoregressive distributed lag (ARDL) model, the study finds that government spending has a positive and statistically significant effect on long-term economic growth. Conversely, taxation is associated with a negative long-run impact, implying that high tax burdens may suppress private sector activity. In the short term, the influence of both variables appears weaker and less consistent, suggesting that fiscal interventions take time to produce tangible economic effects. The study emphasizes the importance of guiding fiscal policy through principles of efficiency, transparency, and strategic public investment, particularly in sectors that enhance productivity and employment. These findings support the case for a balanced fiscal approach that avoids excessive deficits while ensuring sufficient support for development priorities. The paper by Mojsovska (2022) provides an in-depth analysis of the key macroeconomic trends and challenges facing North Macedonia between 2016 and 2022. The author highlights that the country has maintained relative macroeconomic stability over the years, despite external shocks such as the COVID-19 pandemic and the energy crisis following the Russian invasion of Ukraine. However, the study identifies critical vulnerabilities, namely rising inflation, increased public debt, and widening fiscal deficits, as threats to future stability. Mojsovska emphasizes the importance of maintaining monetary and fiscal discipline while managing these risks, especially in times of global uncertainty.

The IMF (2025) report titled "Republic of North Macedonia: Selected Issues" addresses key macroeconomic challenges and structural vulnerabilities affecting the country's economic stability. One of the core findings is that North Macedonia's medium-term growth potential is constrained by low productivity growth, limited private investment, and labor market inefficiencies. The report stresses the importance of improving the business environment, strengthening institutions, and boosting public investment efficiency, especially in infrastructure and human capital. Additionally, the IMF underscores the growing risk posed by rising public debt and fiscal pressures. While fiscal policy has played a crucial role in mitigating recent shocks, such as the pandemic and energy crisis, the report recommends a gradual return to fiscal consolidation to preserve long-term debt sustainability. Inflation,

although moderating, remains a concern due to its impact on real incomes and inequality.

The report also highlights the need for structural reforms to enhance competitiveness, including digitalization, improved governance, and education system reform to address skills mismatches. Overall, the IMF advocates for a balanced policy mix: prudent macroeconomic management combined with targeted structural reforms to achieve sustainable economic stability and inclusive growth in North Macedonia (IMF, 2025).

Kovachevska Stefanova et al. (2025) examine how external shocks—such as the COVID-19 pandemic, the war in Ukraine, and global financial tightening—have affected the macroeconomic environment in North Macedonia. The authors find that the country's high trade openness and reliance on energy imports make it particularly vulnerable to global disruptions. External shocks have intensified inflationary pressures, widened fiscal deficits, and slowed GDP growth, revealing structural weaknesses in the economy. The study highlights that while fiscal and monetary responses helped cushion the initial impact of these shocks, the effectiveness of these policies is limited by institutional constraints and fiscal space. Moreover, spillovers from the euro area and global commodity markets have strong and persistent effects on domestic inflation and economic activity. The authors recommend enhancing macroeconomic buffers, diversifying energy sources, and improving regional cooperation to strengthen resilience against future shocks. Their findings emphasize that in a small open economy like North Macedonia, macroeconomic stability is highly sensitive to international developments, and long-term stability requires not only domestic policy reforms but also stronger integration into global value chains and improved crisis response mechanisms.

Petreski et al. (2024) provide evidence that tax revenue shocks exert a contractionary effect on output, underscoring the restrictive nature of taxation within the economy of North Macedonia. Their findings emphasize the critical need to differentiate between fiscal instruments and the timing of their implementation. The authors advocate for a reorientation of public expenditure toward capital investments, which are shown to be more conducive to long-term economic growth than current spending. Furthermore, they stress the importance of enhancing fiscal transparency and adopting robust medium-term budgetary frameworks to improve policy credibility and overall fiscal efficiency.

Research Methodology

This study aims to identify and analyze the macroeconomic drivers of economic stability in North Macedonia by using a robust time series econometric approach. To accomplish this, the research employs the Vector Autoregression (VAR) methodology, complemented by unit root testing through the Augmented Dickey-Fuller (ADF) test and Granger causality testing. The methodology is structured to uncover both short-term dynamics and long-term interdependencies among key macroeconomic indicators, including GDP growth, inflation, money supply, interest rates, fiscal balance, unemployment, and the current account balance. These variables collectively shape the country's economic stability and reflect the multifaceted interaction of domestic and external forces in a small, open economy.

The empirical analysis is conducted using annual data spanning from 2000 to 2023. This period was selected based on both data availability and economic significance. All macroeconomic data used in the analysis were sourced from the Basic Economic database of the National Bank of the Republic of North Macedonia. It encompasses major structural changes in North Macedonia's economy, including periods of post-conflict stabilization, financial and sovereign debt crises in Europe, and the more recent economic pressures related to global supply disruptions and inflation shocks. The choice of this time frame allows the study to assess the resilience of North Macedonia's macroeconomic framework over more than two decades of domestic and global volatility.

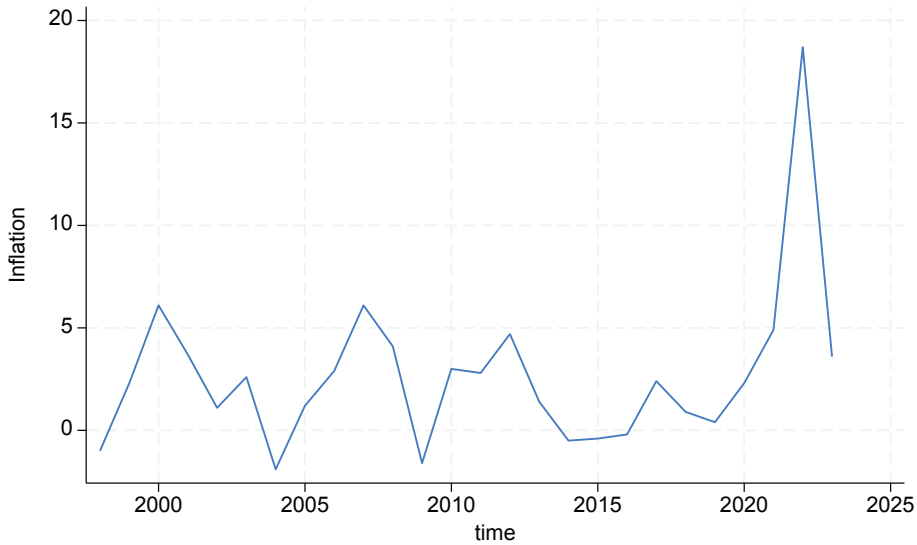
Variables and Descriptive Analysis

The variables used in the study include key macroeconomic indicators such as GDP Growth, Inflation, Unemployment, Government Budget, Money Supply (m1), Current Account Balance, and Interest Rate.

Inflation, measured as the annual change in consumer prices, is a crucial macroeconomic indicator reflecting the stability of a country's price level over time. In the post-2000 period, the country maintained relatively low and stable inflation, largely due to a credible monetary policy anchored in an exchange rate peg to the euro. However, recent global disruptions, such as the COVID-19 pandemic, energy price volatility, and the spillovers from geopolitical tensions, including the war in Ukraine, have contributed to a surge in consumer prices. In 2022, inflation reached double digits, driven primarily by food and energy prices, posing challenges for real incomes, consumption, and monetary stability (Graph 1).

Graph 1

Inflation Rate in North Macedonia

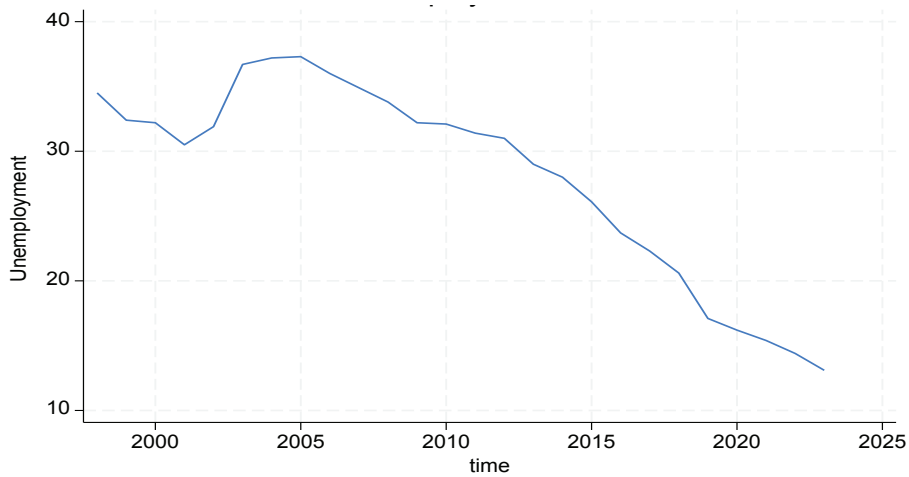


Note: Basic Economic Indicators, National Bank of the Republic of North Macedonia

The unemployment rate in North Macedonia represents a persistent structural challenge and is a key indicator of labor market health. The analysis of the first difference in unemployment is particularly useful in this study to capture cyclical fluctuations and the responsiveness of the labor market to macroeconomic shocks (Graph 2). For example, during the global financial crisis and the pandemic-induced downturn, the labor market in North Macedonia experienced significant strain, while recovery periods saw slow job creation, indicating rigidities. Moreover, labor market outcomes are tightly linked to the effectiveness of government policy, education system alignment with labor demand, and emigration trends.

Graph 2

Unemplyment Rate in North Macedonia

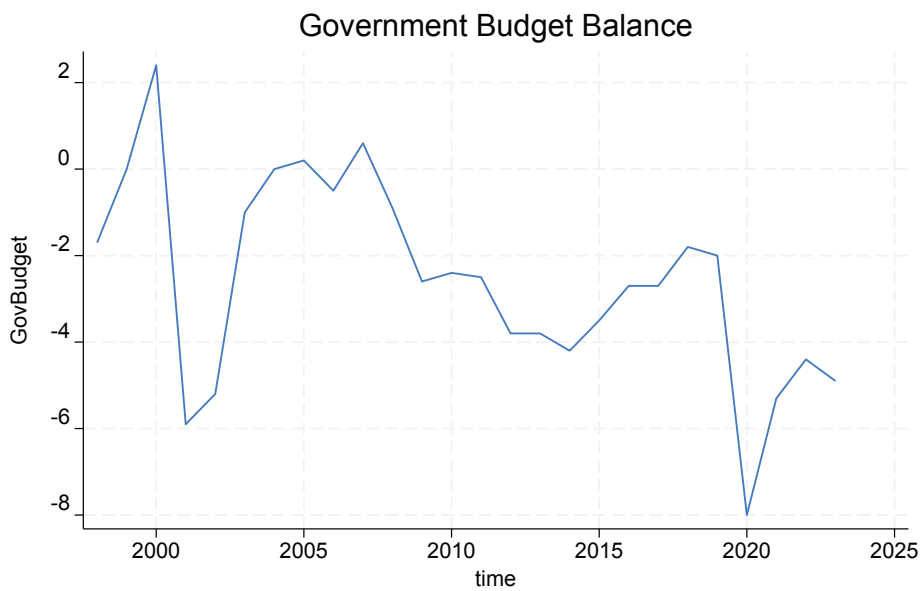


Note: Basic Economic Indicators, National Bank of the Republic of North Macedonia

The government budget balance, measured as a percentage of GDP, is a direct reflection of fiscal policy orientation, whether expansionary or contractionary, and a key determinant of economic stability. In North Macedonia, fiscal policy has historically oscillated between consolidation efforts and counter-cyclical spending, depending on external conditions and political priorities. The country has made efforts to maintain fiscal discipline, but structural deficits persist due to rigid public spending, low tax compliance, and underperforming state-owned enterprises. In this study, the fiscal balance is investigated not only as a standalone indicator but also in conjunction with other macroeconomic variables to evaluate how fiscal policy affects inflation, growth, and external balances (Graph 3).

Graph 3

Government Budget Balance

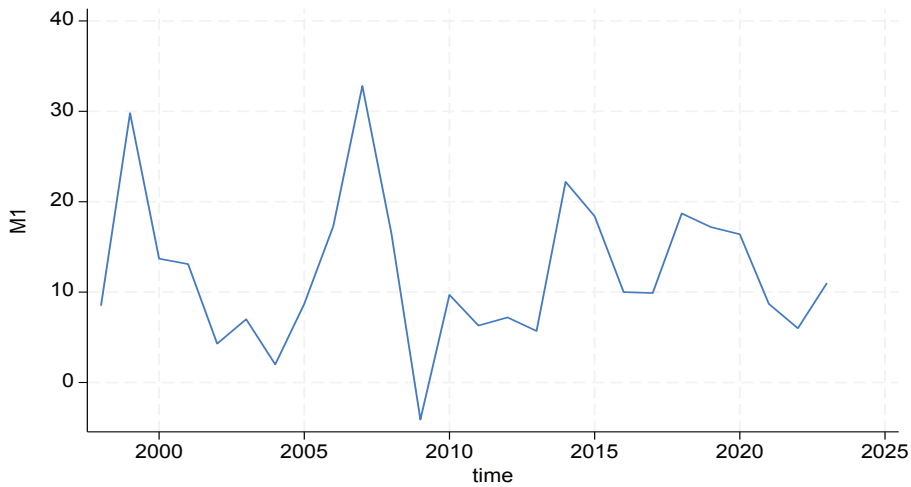


Note: Basic Economic Indicators, National Bank of the Republic of North Macedonia

Money supply, particularly measured through the broad money aggregate M1, plays a central role in determining liquidity conditions and the effectiveness of monetary policy transmission. In North Macedonia, the National Bank (NBRNM) has maintained a relatively stable monetary environment through a de facto exchange rate peg to the euro, which constrains the use of independent interest rate tools and places greater emphasis on money supply management. The analysis of money supply in this research aims to capture how monetary conditions influence macroeconomic stability and whether the growth of money is aligned with real sector developments (Graph 4). Furthermore, by observing the responsiveness of inflation and GDP growth to money supply shocks, the study evaluates the relevance of monetary targeting under a constrained exchange rate regime.

Graph 4

Money Supply in North Macedonia

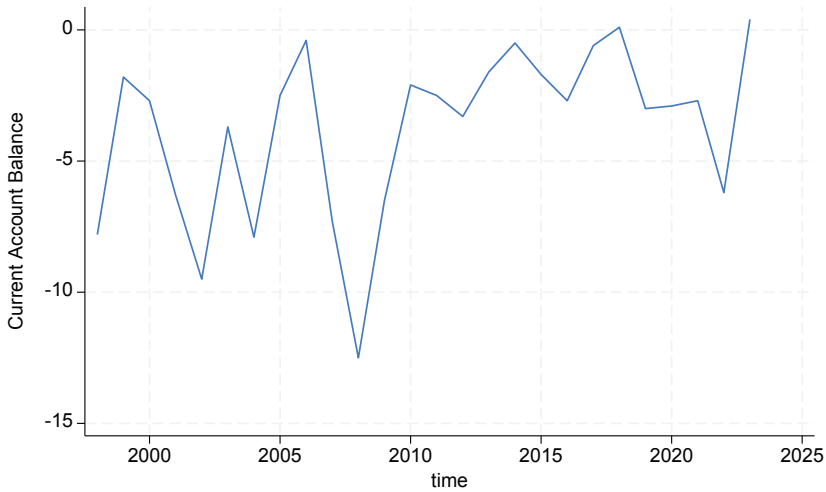


Note: Basic Economic Indicators, National Bank of the Republic of North Macedonia

The current account balance as a percentage of GDP serves as a critical indicator of a country's external position, reflecting the net outcome of trade in goods and services, primary income, and current transfers. For North Macedonia, a small and open economy, the current account balance is particularly significant due to its high dependence on foreign trade and capital inflows. In this research, the current account balance is analyzed as both a cause and consequence of broader macroeconomic dynamics, particularly how it interacts with fiscal balance, exchange rate policy, and inflation, providing insights into the resilience of North Macedonia's economy to external shocks (Graph 5).

Graph 5

Current Account Balance in North Macedonia

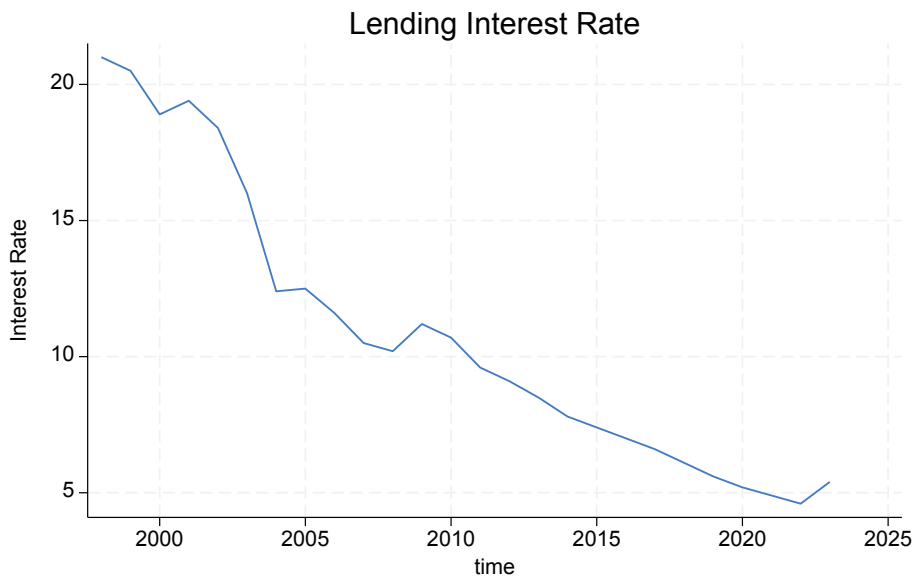


Note: Basic Economic Indicators, National Bank of the Republic of North Macedonia

The short-term interest rate, as determined by the central bank, is a primary tool of monetary policy used to influence borrowing costs, aggregate demand, and inflation expectations. In the case of North Macedonia, the central bank operates under a de facto exchange rate peg to the euro, which limits the scope for independent interest rate policy (Graph 6). In this paper, both the level of interest rates and their first differences are used to examine how monetary policy shifts impact the broader economy. Specifically, the analysis investigates whether interest rate changes Granger-cause variations in inflation and GDP, shedding light on the transmission mechanism of policy decisions. Moreover, interest rates are indirectly influenced by external factors such as ECB policy, capital market conditions, and risk perceptions of international investors. Therefore, understanding the role of interest rates in North Macedonia provides valuable insights into the trade-offs faced by policymakers in maintaining monetary stability, controlling inflation, and supporting economic growth under a constrained policy framework.

Graph 6

Interest rate in North Macedonia



Note: Basic Economic Indicators, National Bank of the Republic of North Macedonia

Augmented Dickey-Fuller (ADF) Test

The ADF test is used to determine whether each time series variable is stationary (i.e., has a constant mean and variance over time). This is a critical step before using a Vector Autoregression (VAR) model because non-stationary variables can produce misleading (spurious) results. If a variable is not stationary at level, it must be differenced.

Table 1

ADF Test Results

Variable	Test Statistic	5% Critical Value	p-value	Stationary
gdpg	-4.880	-3.000	0.0000	Yes
inflation	-3.926	-3.000	0.0019	Yes
unemployment	1.233	-3.000	0.9962	No
dunemployment	-3.099	-3.000	0.0266	Yes (1st diff)
govbudget	-2.912	-3.000	0.0439	Borderline
dgovbudget	-5.723	-3.000	0.0000	Yes
m1	-3.887	-3.000	0.0021	Yes
currentaccountbalance	-3.555	-3.000	0.0067	Yes
interestrate	-2.254	-3.000	0.1872	No
dinterestrate	-3.703	-3.000	0.0041	Yes (1st diff)

The Dickey–Fuller test confirms that most variables are stationary at the level, such as GDP growth, inflation, M1, and current account balance. These can be directly included in the VAR at the levels. However, unemployment, government budget, and interest rate are non-stationary at the level, meaning they exhibit a unit root. For these variables, their first differences (e.g., dunemployment, dgovbudget, and dinterestrate) are stationary and hence appropriate for inclusion in the VAR model.

From an economic perspective, the presence of unit roots in unemployment and interest rate series is not surprising. These variables often adjust slowly to shocks due to structural labor market rigidities and monetary policy inertia. Differencing them allows us to model the short-term changes, which are more relevant for dynamic interaction analysis.

Including only stationary series ensures that our VAR model is correctly specified and avoids spurious relationships. The differenced series captures the true short-run dynamics, which is critical when the model is used for Granger causality testing, impulse response analysis, or forecasting.

Results of the Vector Autoregression (VAR) Model

A Vector Autoregression (VAR) model was implemented using seven key macroeconomic variables: GDP growth (gdpg), inflation, money supply (m1), current account balance, unemployment (dunemployment), government budget balance (dgovbudget), and interest rate (dinterestrate) over the period 2000–2023 with

two lags. The optimal number of lags was determined based on the Akaike Information Criterion (AIC) and the Schwarz Bayesian Criterion (SBC).

Table 2

VAR Equation Summary

Equation	Parameters	RMSE	R-squared	Chi2	p-value
gdpg	15	2.49562	0.6801	48.89146	0
inflation	15	3.55155	0.7224	59.85495	0
m1	15	6.07962	0.7767	80.01725	0
currentaccountbalance	15	2.49247	0.7943	88.82371	0
dunemployment	15	1.25441	0.7721	77.90801	0
dgovbudget	15	2.55682	0.6286	38.92689	0.0004
dinterestrate	15	0.677829	0.8133	100.1847	0

All equations are highly statistically significant ($p < 0.001$), which confirms that the lags of the variables jointly explain a significant portion of the variation in each dependent variable. The R-squared values are all strong, ranging from 0.6286 (government budget) to 0.8133 (interest rate), indicating a good model fit.

Economically, the results reflect deep interactions between policy and performance indicators. GDP growth ($R^2 = 0.6801$) is well explained by inflation, monetary conditions, fiscal stance, and trade dynamics. Inflation ($R^2 = 0.7224$) is strongly explained by its past values and related variables, consistent with theories of inertia and expectations. The money supply (m1) equation ($R^2 = 0.7767$) suggests it is responsive to economic shocks and policy feedback.

The current account balance ($R^2 = 0.7943$) shows a very strong fit, reflecting the country's sensitivity to internal and external conditions. The unemployment equation ($R^2 = 0.7721$) further confirms that labor market fluctuations are shaped by macroeconomic policy and growth conditions. Although the government budget balance ($R^2 = 0.6286$) has the lowest fit, it is still significant, reflecting that fiscal outcomes are partially policy-driven and partially automatic. The interest rate ($R^2 = 0.8133$) has the best explanatory power, indicating that monetary policy reacts strongly to macro conditions, particularly inflation and output.

Overall, this VAR estimation demonstrates that North Macedonia's economy exhibits strong short-term linkages, with both fiscal and monetary policies having measurable and interconnected effects on key economic outcomes. The model is

statistically sound and economically meaningful, making it a solid foundation for further forecasting, simulation, and policy impact analysis.

Table 3

Estimated Coefficients from the Vector Autoregression (VAR) Model

Dependent Variable	Explanatory Variable	Lag	Coefficient	p-value	Granger-Causes?
gdpg	gdpg	L1	-0.9429	0.008	Yes
gdpg	gdpg	L2	0.4938	0.2743	No
gdpg	inflation	L1	0.3241	0.026	Yes
gdpg	inflation	L2	-0.0369	0.2334	No
gdpg	m1	L1	0.361	0	Yes
gdpg	m1	L2	-0.1235	0.05	Yes
gdpg	currentaccountbalance	L2	-0.8792	0.008	Yes
gdpg	dunemployment	L1	-1.6051	0.024	Yes
gdpg	dunemployment	L2	1.5045	0.006	Yes
gdpg	dgovbudget	L2	-1.1341	0.001	Yes
inflation	inflation	L1	1.0794	0	Yes
inflation	inflation	L2	-0.8346	0.012	Yes
inflation	m1	L2	0.3057	0.001	Yes
inflation	currentaccountbalance	L1	0.9436	0.002	Yes
inflation	currentaccountbalance	L2	-1.0261	0.031	Yes
inflation	dunemployment	L1	-2.5524	0.011	Yes
inflation	dunemployment	L2	2.0322	0.009	Yes
inflation	dgovbudget	L2	-1.8477	0	Yes
inflation	dinterestrate	L1	-3.2251	0.049	Yes
m1	gdpg	L2	2.2664	0.001	Yes
m1	inflation	L1	0.7122	0.044	Yes
m1	m1	L2	-0.3588	0.019	Yes
m1	currentaccountbalance	L1	2.5748	0	Yes
m1	currentaccountbalance	L2	-1.6185	0.046	Yes
m1	dunemployment	L1	-5.5327	0.001	Yes
m1	dgovbudget	L2	-3.2261	0	Yes
m1	dinterestrate	L1	-10.2874	0	Yes
currentaccountbalance	m1	L1	-0.4237	0	Yes

Dependent Variable	Explanatory Variable	Lag	Coefficient	p-value	Granger-Causes?
currentaccountbalance	m1	L2	-0.2222	0	Yes
currentaccountbalance	dunemployment	L2	-2.0441	0	Yes
currentaccountbalance	dinterestrate	L2	-1.2133	0.041	Yes
dunemployment	m1	L1	-0.1145	0.025	Yes
dunemployment	currentaccountbalance	L1	-0.2649	0.012	Yes
dunemployment	dgovbudget	L1	-0.3598	0.039	Yes
dgovbudget	dunemployment	L2	1.1336	0.042	Yes
dinterestrate	inflation	L1	0.1114	0.005	Yes
dinterestrate	dunemployment	L1	-0.6089	0.002	Yes
dinterestrate	dunemployment	L2	-0.2964	0.045	Yes
dinterestrate	dinterestrate	L1	-0.7572	0.016	Yes
dinterestrate	dinterestrate	L2	-0.3769	0.02	Yes

The summarized VAR estimation results in the table above reveal strong dynamic interdependencies among key macroeconomic variables in North Macedonia, both from an economic and econometric standpoint. The significance of lagged variables (with p-values < 0.05) across equations indicates the rejection of the null hypothesis in favor of Granger causality. For instance, GDP growth (GDPG) is significantly Granger-caused by its own past values (L1), inflation, money supply (M1), the current account balance, unemployment, and fiscal stance (dgovbudget), reflecting a rich autoregressive structure and policy-driven influences. The money supply, particularly, emerges as a core transmission mechanism, with M1 at lag 1 and 2 significantly affecting GDP, inflation, the current account, and even unemployment, demonstrating both demand-side effects and the consequences of liquidity on external balances. Inflation is highly inertial (inflation L1 and L2 are significant) and also influenced by monetary policy, labor market conditions, fiscal balance, and interest rates, reinforcing the complexity of price level dynamics. The labor market (unemployment) appears reactive to monetary and external changes, while fiscal policy (dgovbudget) is driven partially by unemployment shifts. The interest rate equation aligns with expectations from Taylor Rule dynamics, responding to inflation and unemployment with significant coefficients. From an economic perspective, these results suggest that both monetary and fiscal tools have measurable delayed impacts across key macroeconomic indicators, with feedback loops observ-

able especially in the relationships involving inflation, money, and interest rates. The findings confirm the importance of coordinated policy-making and validate the use of VAR models for forecasting and policy simulation in small open economies like North Macedonia.

Results of the Granger Causality Test

Granger causality tests help us understand whether one variable helps predict another. Although it does not imply true causation, it provides insights into predictive power and temporal ordering, useful for forecasting and policy guidance.

Table 4

Granger Causality Results

Dependent Variable	Excluded Variable	Chi2	p-value	Granger-causes?
gdpg	inflation	5.241	0.073	No
gdpg	m1	18.003	0	Yes
gdpg	currentaccountbalance	7.459	0.024	Yes
gdpg	dunemployment	10.981	0.004	Yes
gdpg	dgovbudget	13.127	0.001	Yes
gdpg	dinterestrate	3.308	0.191	No
inflation	gdpg	0.894	0.64	No
inflation	m1	11.96	0.003	Yes
inflation	currentaccountbalance	10.449	0.005	Yes
inflation	dunemployment	11.378	0.003	Yes
inflation	dgovbudget	16.776	0	Yes
inflation	dinterestrate	3.93	0.14	No
m1	gdpg	11.813	0.003	Yes
m1	inflation	10.369	0.006	Yes
m1	currentaccountbalance	25.449	0	Yes
m1	dunemployment	11.09	0.004	Yes
m1	dgovbudget	16.234	0	Yes
m1	dinterestrate	13.459	0.001	Yes
currentaccountbalance	gdpg	0.2	0.905	No
currentaccountbalance	inflation	2.093	0.351	No
currentaccountbalance	m1	27.311	0	Yes
currentaccountbalance	dunemployment	17.598	0	Yes

Dependent Variable	Excluded Variable	Chi2	p-value	Granger-causes?
currentaccountbalance	dgovbudget	2.007	0.367	No
currentaccountbalance	dinterestrate	4.578	0.101	No
dunemployment	gdpg	1.756	0.416	No
dunemployment	inflation	1.563	0.458	No
dunemployment	m1	5.529	0.063	No
dunemployment	currentaccountbalance	6.578	0.037	Yes
dunemployment	dgovbudget	7.929	0.019	Yes
dunemployment	dinterestrate	1.422	0.491	No
dgovbudget	gdpg	3.368	0.186	No
dgovbudget	inflation	1.379	0.502	No
dgovbudget	m1	3.545	0.17	No
dgovbudget	currentaccountbalance	1.089	0.58	No
dgovbudget	dunemployment	4.438	0.109	No
dgovbudget	dinterestrate	0.898	0.638	No
dinterestrate	gdpg	1.741	0.419	No
dinterestrate	inflation	9.059	0.011	Yes
dinterestrate	m1	2.7	0.259	No
dinterestrate	currentaccountbalance	1.897	0.387	No
dinterestrate	dunemployment	16.661	0	Yes
dinterestrate	dgovbudget	1.476	0.478	No

The full Granger causality analysis reveals a complex and insightful web of predictive relationships among North Macedonia's key macroeconomic indicators. Beginning with GDP growth as the dependent variable, the results indicate that it is significantly Granger-caused by money supply (M1), current account balance, unemployment, and government budget balance. These findings suggest that both monetary and fiscal policy tools, as well as external sector performance and labor market conditions, hold predictive power over economic growth. In contrast, inflation and interest rates do not statistically lead GDP growth, indicating that output changes are more closely tied to policy decisions and structural factors than to nominal fluctuations in this context.

Inflation, on the other hand, is Granger-caused by M1, unemployment, current account balance, and government budget, underscoring its multifaceted nature. It is influenced by demand-side factors such as the money supply and fiscal stance, cost-push pressures via unemployment, and external price movements. Interestingly, inflation

is not predicted by GDP or interest rates, suggesting that in this economy, price level dynamics are not directly driven by output or nominal interest rate shifts.

The money supply (M1) shows strong bidirectional causality with most variables, including GDP, inflation, current account, unemployment, government budget, and interest rates. This suggests that M1 is both a driver and a responder within the macroeconomic system, embodying the dual role of monetary aggregates as instruments of policy and outcomes of macroeconomic conditions. This dynamic interdependence reinforces the importance of monitoring money supply developments when forecasting or adjusting policy.

The current account balance is primarily Granger-caused by M1 and unemployment, suggesting it is influenced by domestic liquidity conditions and labor market strength. However, it does not respond significantly to GDP, inflation, fiscal balance, or interest rates, implying a degree of insulation or structural rigidity in its responsiveness to broader economic shifts.

Unemployment is significantly Granger-caused by the current account balance and government budget, indicating that trade performance and public sector fiscal decisions impact labor market conditions. Notably, unemployment is not statistically predicted by GDP, inflation, M1, or interest rates in the short term, which could point to structural challenges or delayed labor market responsiveness in North Macedonia.

The government budget balance does not appear to be Granger-caused by any of the variables, positioning it as an exogenous driver in this system. This likely reflects discretionary fiscal policy, where government spending and revenue decisions are not automatically adjusted in response to economic fluctuations.

Interest rates are significantly Granger-caused by inflation and unemployment. This aligns with the Taylor Rule framework, where central banks adjust interest rates in response to deviations in inflation and labor market performance. However, interest rates do not respond to GDP, M1, or fiscal and external variables in this model, reinforcing their role as a targeted policy tool rather than a broadly reactive variable.

Overall, these results offer a structured causal map of North Macedonia's macroeconomy. We achieved a deeper understanding of which variables serve as leading indicators and which respond to systemic changes. This knowledge is vital for policymakers, as it enables more proactive and informed decisions, particularly in the design of monetary and fiscal interventions.

Conclusions

This study investigated the macroeconomic drivers of economic stability in North Macedonia using a time series econometric approach based on a Vector Autoregression (VAR) model and Granger causality analysis. The findings reveal strong dynamic interdependencies among key macroeconomic indicators, with both fiscal and monetary factors playing a critical role in shaping short-term fluctuations and policy transmission.

The VAR estimation confirms that GDP growth is significantly influenced by past values of inflation, money supply (M1), the current account balance, unemployment, and fiscal stance. The Granger causality tests reinforce these findings, showing that monetary and fiscal indicators, particularly M1, unemployment, and budget balance, hold predictive power over output, while inflation and interest rates are not significant predictors of growth. Inflation is found to be highly inertial and strongly affected by monetary aggregates and labor market conditions. The money supply stands out as a core transmission channel, with bidirectional causality linking it to nearly all macro variables, emphasizing its dual role as both a policy tool and economic outcome.

The empirical results emphasize the importance of coordinated monetary and fiscal policies in sustaining economic stability. The strong predictive relationships and feedback loops identified in this study provide valuable insights for policymakers, suggesting that proactive management of monetary aggregates, fiscal discipline, and labor market interventions can contribute to a more resilient and balanced economic environment in North Macedonia.

Beyond the regression analysis, the broader macroeconomic context of North Macedonia reveals persistent challenges and structural interdependencies. While the country has achieved progress in employment, financial stability, and moderate growth, especially in the pre-COVID period, these gains remain vulnerable to external shocks and domestic constraints.

The National Bank of the Republic of North Macedonia plays a central role in sustaining price stability and guiding expectations. However, as this and other empirical studies suggest, the effectiveness of monetary transmission is not uniform across all economic variables, and post-crisis dynamics have weakened its pass-through. These findings call for a recalibration of stabilization strategies that reconcile internal goals, like employment and growth, with external pressures from global markets and the limitations of a fixed exchange rate system.

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