

Macroeconomics Dynamics: Exploring the Impact of Stock Market Development on Economic Growth in Mali

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Abstract

Economic growth is often influenced by various factors, with stock market development playing a crucial role. This study investigates the relationship between the stock market development, specifically the Bourse Régionale des Valeurs Mobilières (BRVM), and economic growth in Mali. The BRVM serves eight West African countries, including Mali, and its development may impact regional economies. Utilizing monthly data from January 2009 to December 2020, this research examines the effects of BRVM Market Capitalization, BRVM Composite Index, Capital Flow, and Inflation on Mali's Gross Domestic Product (GDP). The study employs an Autoregressive Distributed Lag (ARDL) model and Vector Error Correction (VEC) model to analyze both short-run and long-run relationships. Findings suggest a significant long-run relationship between stock market development and economic growth in Mali, with inflation and capital flow having negative impacts, while market capitalization and the BRVM Composite Index show positive but less significant effects. The study contributes to understanding the macroeconomic dynamics within West African economies and the importance of stock market development in promoting economic growth.

Gel: E02, E20, O10, F43

1. Introduction

Economic growth has been a central topic in economic discussions for decades. It is generally defined as an increase in the production of goods and services within an economy, typically measured by Gross Domestic Product (GDP). Numerous factors influence economic growth, with stock markets being a significant indicator of a country's economic health. Valderrama (2023) found that financial development contributes to economic growth, but the precise mechanisms and policies needed to promote growth remain inconclusive. Benhabib and Spiegel (2000) established that financial development positively impacts growth and investment, with indicators correlated to both total factor productivity growth and investment, but their correlations differ.

In African economies, stock markets are still evolving and often require increased efficiency to attract more investors and companies. Despite their size, their impact on African economies cannot be overlooked, and the Regional Securities Exchange (Bourse Régionale des Valeurs Mobilières - BRVM) is a notable example.

The BRVM serves as a regional exchange for eight West African countries, including the Republic of Mali. According to the World Bank (2024), Mali has a GDP growth rate of 3.5%, ranking 121st globally in terms of GDP (current US\$) and 24th out of 47 Sub-Saharan African countries. Despite being considered "mostly unfree" with an economic freedom score below the global average but above the regional average (Index of Economic Freedom, 2024), Mali's economy has shown resilience, maintaining slight growth amidst political and security challenges over the past decade.

Mali, along with Cote d'Ivoire, Senegal, Burkina Faso, Niger, Togo, Benin, and Guinea-Bissau, shares the BRVM. The exchange is dominated by companies from Cote d'Ivoire and Senegal, the region's strongest economies. Many economic sectors are listed but health and technology companies are not.

Currently, Mali has only one company listed in the BRVM's main compartment, the Bank of Africa Mali. Although this is a small presence among the 46 listed companies, various economic policies within the West African States Economic Community (ECOWAS) continue to promote economic integration and development (Sustainable Security Exchanges, 2023). Therefore, a regional economic integration is underway even though it still needs rooms for improvements.

The question of "Does the regional stock exchange development affect Mali's economy?" arises. This study investigates the existence of relationship between Mali's economy growth and the BRVM development. In this study, research and publication ethics were complied with.

2. Literature Review

Studies on economic growth and stock market development are not scarce among financial economics research topics. While most of them were conducted on developed economies markets, some are of international dimensions, and others are based on developing economies. Market development effects on asset growth is more noticeable in advance economies (Titman, Wei and Xie, 2013). However, this effect is not related to trading expenses and corporate governance (Titman, Wei & Xie, 2013).

Other studies on the effect of stock market and banks on economic growth show that the former has more significant effect on economic growth than the latter (Arestis et al., 2001). It is worth reminding that banks are also strong players in the stock markets. Çiftçi et al (2017) found similar results but stressed that credit market contribute more on the positive of stock market development on economic growth. Following Schumpeter's assertion (1911) that financial intermediaries' core activities promote long term economic growth, Drebenstov, Bergsman and Broadman (1993) established there is strong correlation between financial development and economic growth, investment rates and capital efficiency.

Most studies on developed nations have determined a positive relationship between market development and growth; this result was confirmed by Pradhan (2018) from his research on G-20 countries. He further stressed the need for sustainable economic policies. Opposite results were

found in Belgium by Tsaurai (2016) when he established the absence of long-term causality between stock market development and economic growth. However, Baral (2019) found a result in line with previous empirical studies in Nepal.

Conclusive studies have also been conducted on emerging economies. El-Wassal (2008) carried out a study on 40 emerging economies from 1980 to the year 2000. He found that economic growth, financial freedom policies and foreign portfolio investment are the primary causes of stock market growth. Similarly, studies are scarce in Sub-Saharan African countries; Enisan and Olufisayo (2009) analyzed the impact of market development to economic growth. Using a bound test and Vector Error Correlation Model, they found that stock market development cause economic growth in Egypt and South African. Their study further established that there is a two-directional Granger causal relationship between stock market development and economic growth in Cote d'Ivoire, Kenya, Morocco and Zimbabwe.

Furthermore, Adjasi and Biekpe (2006) conducted a similar study on 14 African nations. They found a positive impact on stock market development on economic growth in most upper-middle-income economies and in moderately capitalized markets. The study leads to the conclusion that more developed and capitalized economies in Africa are in better position to drive countries to economic growth. Alfonso and Reimers (2021) investigated on the relationship between stock markets and economic growth in African countries; they found that the introduction of stock market leads to a hump-shaped increased in GDP per capita; the effect peaks in the fifth year and becomes insignificant afterward. They stressed that ongoing market development and supportive policies are necessary for sustainable results. Different results were found by Kagochi and Durmaz (2020). They conducted a study on the relationship between stock market development, human capital and economic growth on Sub-Saharan Africa. They found that human capital positively affects economic growth unlike stock market development. Similar research was carried out by Ali and Adahama (2023) on selected African economies with focus on market development, monetary policy and economic growth. They underscore that both market development and monetary policy have a positive effect on economic Algeria, Angola, Libya and Nigeria.

Yu, Hassan and Sanchez (2012) found different causal relationship between stock market development and financial factors across different regions and income groups. Nazir, Nawaz and Gilani (2010), on their study on Pakistan stock markets, established that the size and market capitalization can strongly influence economic growth. Filer, Hanousek and Campos (2000) had found similar results but stressed that the effect can lead to currency appreciation.

In his comparative study between bank-based versus market-based financial systems, Tadesse (2002) observed that market-based systems are more effective in economies with developed financial sectors while bank-based systems have better performance in less developed financial environments. This indicates that countries' conditions determine the financial infrastructure.

In Mali, as in the rest of west Africa region, financial integration is enhanced by the West Africa Economic and Monetary Union (WAEMU) through the creation of a regional stock exchange: Bourse Regionale des Valeurs Mobilières (El-Wassal, 2008). El-Wassal (2008) further stressed that financial freedom policies and foreign portfolio investment play a crucial role in promoting stock market growth; he also determined that reducing entry barriers and enhancing market efficiency attract foreign investments.

The results of El Wassal's study also indicated that low country risk promotes stock market growth. Unlike country risk, high interest rate negatively affects stock market development (Vazakidis and Adamopoulos, 2009). Levine and Zervos (1996) had indicated that, whilst there is a positive correlation between economic development and stock development, the correlation is but partial and not definitive. This may lead to the understanding that stock market development can be influenced by many factors; political stability, regulatory quality and the overall economic environment could all play important role.

Studies on the correlation between stock market development and economic development have not always showed a positive correlation, in reference to Tsaurai (2016) and Filer et al. (2000). This leads to the conclusion that there is need for tailored policy approaches. Some argued that the effectiveness of financial systems is context-based and that policies meant for advocating the market and financial architecture must be adapted to each country's specific conditions (Tadesse, 2002).

3. Data and Methodology

In this section, data set, research methodology and empirical findings are presented.

3.1 Data Set

This study looks possible relationships between economic growth and other macroeconomic factors, notably Inflation, BRVM Market Capitalization, Capital Flow and BRVM Composite Index.

Gross Domestic Product (GDP)

The economic well-being of a nation or region is frequently evaluated using Gross Domestic Product (GDP), which quantifies the total market worth of all final products and services generated and provided within a designated timeframe by one or multiple countries. It represents the

economic growth in this study.

Inflation

As a widely used metric for gauging economic spending, the Consumer Price Index (CPI) serves as a valuable tool. In the context of this particular investigation, the CPI was employed to assess inflation levels.

Market Capitalization

The market capitalization of a publicly traded company represents the combined worth of all the common shares held by shareholders. This value is determined by multiplying the market price per common share by the total number of outstanding common shares.

Capital Flows

These include all transactions recorded in the capital accounts, as well as the financial account of the balance of payments, such as foreign direct investments (FDI), portfolio investments, and other investments including loans and banking capital.

BRVM Composite Index

The BRVM Composite is a stock index calculated from the value of each stock on the BRVM. The BRVM Composite is a West African stock market index created with the base 100 on September 15, 1998. Monthly data from January 2009 to December 2020 were used to conduct this study. Data were collected from International Monetary Fund, World Bank and BRVM websites. Not all data were available in monthly data; those available in daily and annual frequencies, were converted into monthly frequencies.

Table 1
Macroeconomic Factors Used in Analysis

Variable	Indicator	Measurement	Source	Variable Type
Economic Growth	GDP	$\frac{GDP_t - GDP_{t-1}}{GDP_{t-1}} \text{Log} \left(\frac{GDP_t}{GDP_{t-1}} \right)$	World Bank	Dependent
Inflation	Consumer Price Index	$\frac{CPI_t - CPI_{t-1}}{CPI_{t-1}} \text{Log} \left(\frac{CPI_t}{CPI_{t-1}} \right)$	International Monetary Fund	Independent
Stock Market Index	BRVM Composite	$\frac{P_t - P_{t-1}}{P_{t-1}} \text{Log} \left(\frac{P_t}{P_{t-1}} \right)$	BRVM	Independent
Market Capitalization	Market Capitalization	$\frac{MKC_t - MKC_{t-1}}{MKC_{t-1}} \text{Log} \left(\frac{MKC_t}{MKC_{t-1}} \right)$	BRVM	Independent
Capital Flows	Capital Flow	$\frac{CPF_t - CPF_{t-1}}{CPF_{t-1}} \text{Log} \left(\frac{CPF_t}{CPF_{t-1}} \right)$	World Bank	Independent
Source: Generated by Author				

3.2 Research Methodology

This study explores the existence of relationship (long or short) between GDP and other variables (BRVM Composite, Market Capitalization, Capital flow and Inflation). Eviews 10 was used to perform the analyses. The generic research model determined is the following:

$$GDP_{it} = \beta_0 + \beta_1 INFL_{it} + \beta_2 MKC_{it} + \beta_3 CPF_{it} + \beta_4 BRVM_{it} + \epsilon_{it} \quad (1)$$

Where:

β_0

Constant

β_1

Inflation sensitivity monthly change

β_2

Sensitivity of monthly change in Market Capitalization

β_3

Sensitivity of monthly change in Capital Flow

β_4

Sensitivity of monthly change in BRVM Composite

μ_{it}

Error term

The series normality test was first carried out. The variables logged values will be used to conduct the afterward-tests. The series stationarity test was then performed to detect a possible unit root; the test was run at both the Level and the First Difference. In the event where the series are $I(0)$ and $I(1)$, the Bound Test statistics and not the Johansen Test will be used for cointegration. The Bound Test is more appropriate because it is applicable on series at $I(0)$ and $I(1)$ and is more suitable for small and finite data samples. In the case of a Level relationship the variables, it will indicate that there are both short-run and long-run relationships between the variables. An Autoregressive Distributed Lag (ARDL) and a Vector Error Correction (VEC) models will be determined. The Error Correct model to be estimated is as follows:

$$\Delta GDP_T = \gamma_0 + \sum_{i=0}^p \gamma_1 \Delta INFL_{t-1} + \sum_{i=0}^p \phi_1 CPF_{t-1} + \sum_{i=0}^p \phi_1 MKC_{t-1} + \sum_{i=0}^p \phi_1 BRVM_{t-1} + \mu ECT_{t-1} + u_i \quad (2)$$

γ_1 and ϕ_i stand for short-term coefficients, as for Δ , it represents the difference operator, μ stands for the order of delay, u_i represent the residuals and ECT_{t-1} signifies the term for error correction.

The ECT is expressed as follows:

$$GDP_{t-1} = \delta_1 INFL_{t-1} + \delta_2 CPF_{t-1} + \delta_3 MKC_{t-1} + \delta_4 BRVM_{t-1} + \epsilon_1$$

3

The long-term association between variables is displayed by ECT. The rate at which stock returns revert to equilibrium following a long-term divergence is measured by the μ coefficient. The system is considered balanced if the error correction coefficient is less than 1, and when it is negatively indicated, it suggests that, in the event of a deviation from balance, there is a movement towards equilibrium. In other words, according to Bozkurt (2007: 166), the mistake correction process functions.

3.3 Empirical Findings

The result for the normality test is as follows

Table 2
Normality Test

	GDP	CAPITAL_FLOW	BRVM_COMP	INFLATION_CHANGE	MARKET_CAP
Mean	3.889118	2.975233	-0.000436	-0.337083	0.085132
Median	4.754179	3.111801	-0.001400	-0.041667	0.106027
Maximum	7.084700	4.971522	0.152600	3.560000	0.353846
Minimum	-1.235500	1.003936	-0.110900	-6.710000	-0.115385
Std. Dev.	2.225470	0.899308	0.044650	2.358703	0.101483
Skewness	-0.721538	-0.190079	0.549780	-0.565118	-0.102936
Kurtosis	2.282130	2.454369	3.828300	2.692086	2.643682
Jarque-Bera	15.58682	2.653401	11.37067	8.233467	1.016077
Probability	0.000412	0.265351	0.003395	0.016298	0.601675
Sum	560.0330	428.4336	-0.062800	-48.54000	12.25895
Sum Sq. Dev.	708.2384	115.6519	0.285092	795.5778	1.472739
Observations	144	144	144	144	144
Source: <i>Generated by Author</i>					

The skewness' different values are all close to zero (0), which is the normal value for skewness for a normally distributed series. The Kurtosis, that displays the peak of flatness of the distribution of a series, has the value 3 as the normal Kurtosis value for a normally distributed series; the different series in this study have kurtosis values close to 3. Theses give enough idea that the series are normally distributed.

The Jarque-Bera statistics measure the difference the skewness the kurtosis of the variables. The null hypothesis states that the distribution is normal. At 1% significance level, it is safe to accept the null hypothesis. After this test, the logged values of the series were used to perform further tests.

Next, the series stationarity test was performed, and the relative results are as follow:

Table 3
Unit Root Test for Stationarity

UNIT ROOT TEST RESULTS TABLE (ADF)						
Null Hypothesis: the variable has a unit root						
At Level						
		LGDP	LBRVM	LCPF	LINFL	LMKC
With Constant	t-Statistic	-2.4177	-10.9836	-2.3408	-3.1960	-1.3025
	Prob.	0.1387	0.0000	0.1609	0.0223	0.6272
		n0	***	n0	**	n0
With Constant & Trend	t-Statistic	-2.3991	-11.0415	-2.2295	-3.3079	-0.6541
	Prob.	0.3785	0.0000	0.4690	0.0691	0.9737
		n0	***	n0	*	n0
Without Constant & Trend	t-Statistic	-0.7523	0.0300	-0.8969	-0.1454	-0.6330
	Prob.	0.3889	0.6906	0.3259	0.6319	0.4413
		n0	n0	n0	n0	n0
At First Difference						
		d(LGDP)	d(LBRVM)	d(LCPF)	d(LINFL)	d(LMKC)
With Constant	t-Statistic	-5.1972	-5.8691	-1.3978	-5.4405	-2.5570
	Prob.	0.0000	0.0000	0.5816	0.0000	0.1047
		***	***	n0	***	n0
With Constant & Trend	t-Statistic	-5.1808	-5.8046	-1.3210	-5.3427	-2.5787
	Prob.	0.0002	0.0000	0.8783	0.0001	0.2908
		***	***	n0	***	n0
Without Constant & Trend	t-Statistic	-5.2155	-5.8855	-1.3094	-5.4638	-2.5649
	Prob.	0.0000	0.0000	0.1753	0.0000	0.0105
		***	***	n0	***	**
Notes:						
a: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1% and (no) Not Significant						
b: Lag Length based on AIC						
c: Probability based on MacKinnon (1996) one-sided p-values.						
Source: <i>Generated by Author</i>						

The stationarity test depicts that some variables (BRVM and Inflation) are stationary at Level (I(0)) and the rests are I(1). It has been noticed that all the variables are stationary at first difference apart from Capital Flow.

The result for the Bound Test for cointegration is as displayed below;

Table 4
Bound Test for Cointegration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n = 1000				
F-statistic	2.993358	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
Actual Sample Size	142	Finite Sample: n = 80		
		10%	2.303	3.22
		5%	2.688	3.698
		1%	3.602	4.787
Source: <i>Generated by Author</i>				

The F-statistics value is superior to the level value (I(0)) value. This leads to the conclusion that there is enough significance (5%) to reject the null hypothesis of no long-run correlation between the variables. In other others, there is a long-run relationship between the variables.

Both the long and short run models need to be estimated; appropriate techniques are the ARDL and VEC models.

After running the ARDL models, it is necessary to determine the lag length for the afterward-analyses.

Table 5
Lag selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-386.7358	NA	0.000219	5.760821	5.867904	5.804337
1	679.2595	2037.932	4.91e-11	-9.547933	-8.905436	-9.286839
2	990.2493	571.6725	7.33e-13*	-13.75367*	-12.57575*	-13.27499*
3	1010.195	35.19851	7.93e-13	-13.67934	-11.96601	-12.98309
4	1018.648	14.29610	1.02e-12	-13.43601	-11.18727	-12.52218
5	1053.145	55.80269*	8.96e-13	-13.57566	-10.79150	-12.44425
6	1065.952	19.77595	1.09e-12	-13.39635	-10.07678	-12.04736
7	1076.532	15.55843	1.38e-12	-13.18429	-9.329306	-11.61772
8	1082.882	8.872365	1.87e-12	-12.91004	-8.519637	-11.12589
Source: <i>Generated by Author</i>						

As the most decision criteria (including Akaike Information Criteria - AIC), the optimal lag length is 2.

The resulting ARDL model is determined below:

Table 6
ARDL Model – Short Run Relationship

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LGDP(-1)	1.561969	0.069857	22.35951	0.0000
LGDP(-2)	-0.579662	0.072438	-8.002134	0.0000
LMKC	0.358929	0.261641	1.371839	0.1725
LMKC(-1)	-0.547928	0.262494	-2.087395	0.0388
LINFL	-0.034949	0.015853	-2.204529	0.0292
LCPF	-1.689745	0.545708	-3.096425	0.0024
LCPF(-1)	3.029527	1.041353	2.909222	0.0043
LCPF(-2)	-1.403177	0.542557	-2.586228	0.0108
LBRVM	0.051809	0.135294	0.382938	0.7024
LBRVM(-1)	-0.118675	0.133456	-0.889243	0.3755
LBRVM(-2)	0.274655	0.135520	2.026680	0.0447
C	0.091134	0.034009	2.679693	0.0083
R-squared	0.986939	Mean dependent var		0.743008
Adjusted R-squared	0.985834	S.D. dependent var		0.217211
S.E. of regression	0.025853	Akaike info criterion		-4.392089
Sum squared resid	0.086886	Schwarz criterion		-4.142301
Log likelihood	323.8383	Hannan-Quinn criter.		-4.290585
F-statistic	893.0384	Durbin-Watson stat		2.066688
Prob(F-statistic)	0.000000			
*Note: p-values and any subsequent tests do not account for model selection.				
Source: Generated by Author				

The results show that 98.58% of change in GDP is explained by the regressors. Inflation and Capital Flow, with enough significance level, have both negative effects on GDP. The results also show that Market Capitalization and BRVM Composite index have positive influence on GDP; however, these variables do not have their coefficients significant at 10%.

The long-run relationship results depict the following

Table 7
VEC Model – Long Run Relationship

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGDP(-1))	0.743704	0.069961	10.63024	0.0000
C	-0.000246	0.002341	-0.105022	0.9165
D(LBRVM)	0.002949	0.118500	0.024884	0.9802
D(LBRVM(-1))	-0.232597	0.115459	-2.014544	0.0460
D(LCPF)	-1.513056	0.593852	-2.547869	0.0120
D(LCPF(-1))	1.412658	0.593474	2.380318	0.0187
D(LINFL)	0.048705	0.105546	0.461455	0.6452
D(LINFL(-1))	-0.073573	0.099911	-0.736380	0.4628
D(LMKC)	0.144769	0.261334	0.553963	0.5805
D(LMKC(-1))	-0.570278	0.323002	-1.765552	0.0798
ECT(-1)	-0.022552	0.013302	-1.695332	0.0924
R-squared	0.538897	Mean dependent var		-0.001108
Adjusted R-squared	0.503698	S.D. dependent var		0.037861
S.E. of regression	0.026673	Akaike info criterion		-4.336057
Sum squared resid	0.093197	Schwarz criterion		-4.107085
Log likelihood	318.8601	Hannan-Quinn criter.		-4.243012
F-statistic	15.31015	Durbin-Watson stat		2.157282
Prob(F-statistic)	0.000000			
Source: <i>Generated by Author</i>				

Following the results, it can be noticed that there is an ECT value of -0.0225. the negative sign indicates that shocks in the short run will be corrected in the long run at 10% significance level. In other words, the models will re-adjust itself in the long run after a shock in the long.

To understand the nature of the relationship between the variables, the Granger Causality test was conducted, and the results are as depicted below. The null hypothesis for the test states that A does not Granger cause B.

Table 8
Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.	Decision
LBRVM does not Granger Cause LGDP	142	3.56159	0.0311	Reject
LGDP does not Granger Cause LBRVM		0.32659	0.7219	Accept
LCPF does not Granger Cause LGDP	142	0.60815	0.5458	Accept
LGDP does not Granger Cause LCPF		5.36273	0.0057	Reject
LINFL does not Granger Cause LGDP	142	0.56083	0.5720	Accept
LGDP does not Granger Cause LINFL		0.39282	0.6759	Accept
LMKC does not Granger Cause LGDP	142	2.93939	0.0562	Reject
LGDP does not Granger Cause LMKC		9.91522	0.0001	Reject
LCPF does not Granger Cause LBRVM	142	4.36648	0.0145	Reject
LBRVM does not Granger Cause LCPF		0.47680	0.6218	Accept
LINFL does not Granger Cause LBRVM	142	2.75601	0.0671	Reject
LBRVM does not Granger Cause LINFL		0.12762	0.8803	Accept
LMKC does not Granger Cause LBRVM	142	2.07924	0.1290	Accept
LBRVM does not Granger Cause LMKC		3.26855	0.0411	Reject
LINFL does not Granger Cause LCPF	142	1.95106	0.1461	Accept
LCPF does not Granger Cause LINFL		0.08616	0.9175	Accept
LMKC does not Granger Cause LCPF	142	0.31692	0.7289	Accept
LCPF does not Granger Cause LMKC		2.45837	0.0893	Reject
LMKC does not Granger Cause LINFL	142	0.14488	0.8653	Accept
LINFL does not Granger Cause LMKC		2.94754	0.0558	Reject
Source: <i>Generated by Author</i>				

According to Granger Causality, BRVM Composite Granger causes GDP with the inverse not being true. It simply says that a good performance of BRVM Composite index may have an effect on the Malian GDP and not the other way around. The results also indicated that there is a bidirectional relationship between Market Capitalization and GDP; Market Capitalization Granger causes GDP and at the same GDP Granger causes Market Capitalization.

Moreover, the causality test unveils that GDP causes Capital Flow and not the inverse. Indeed, a high GDP indicated a good economic health and that attracts investor, or foreign direct investment. It has also been determined that Inflation has a unidirectional effect on Market Capitalization.

4. Conclusion

This study explored the relationship between economic growth, as measured by GDP, and various macroeconomic variables, including Inflation, BRVM Market Capitalization, Capital Flow, and the BRVM Composite Index, using data from January 2009 to December 2020. Through rigorous analysis involving normality tests, stationarity tests, the ARDL model, VEC model, and Granger causality tests, several significant findings emerged.

The results indicate that inflation and capital flow negatively impact GDP, whereas market capitalization and the BRVM Composite Index positively influence GDP, though their coefficients are not always significant at the 10% level. The long-run relationship analysis revealed that shocks in the short run are corrected in the long run, indicating the models' tendency to readjust towards equilibrium over time.

The Granger causality test showed that the BRVM Composite Index influences GDP without the reverse being true, suggesting that the performance of the BRVM Composite Index can affect Mali's GDP. Additionally, a bidirectional relationship between market capitalization and GDP was identified, indicating mutual causality. GDP was also found to influence capital flow, underscoring the role of economic health in attracting foreign investments. Furthermore, inflation was shown to affect market capitalization unidirectionally.

Based on these findings, several recommendations can be made for policymakers in Mali. To stimulate economic growth, it is essential to control inflation through effective monetary policies. Enhancing the performance and attractiveness of the BRVM Composite Index could positively

influence GDP; these will call for a regional effort from all the WAEMU countries. Encouraging investments and improving market capitalization can create a virtuous cycle of growth. Additionally, fostering a stable and conducive economic environment is crucial for attracting capital flows and sustaining long-term economic health.

Overall, this study underscores the interconnectedness of macroeconomic variables and their collective impact on economic growth, offering valuable insights for strategic economic planning in Mali.

Declarations

Availability of data and materials

The data of this study were collected from different websites notably those of the World Bank, the IMF and the BRVM. The datasets are available

Competing Interests

The author has no conflicts of interest to declare.

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Authors' contributions

The authors acknowledged their contribution to this study and approved it for publication.

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