Research article

Understanding the Dynamic Linkages: Inflation, Real Balances, and Their Impact on Economic Growth in ECOWAS

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Abstract: This study examines the dynamic relationship between growth, inflation, and real money balances in the Economic Community of West African States (ECOWAS). We apply a new approach by extending comprehensive econometric methods so that monetary dynamics can be better understood in the West African sub-region. The study obtained data from the World Bank from 2006 to 2021 and covered 15 countries. For robustness checks, we estimate dynamic ordinary least squares and fully modified ordinary least squares. These findings reveal the existence of a significant cointegration relationship between growth, real balance, and inflation. Furthermore, this study found that real balance has a positive long-run dynamic impact on growth. Likewise, there is a short-run positive impact of money and inflation on growth. We contribute to the literature on the money-growth nexus by focusing on West Africa, which faces macroeconomic vulnerabilities due to structural imbalances. These findings have policy implications for central banks and the Fiscal Agency. Central Banks must collaborate to reduce money in the informal sector, while Fiscal Authorities must control inflation collectively.

Keywords: growth, inflation, real balances, broad money, ECOWAS

JEL Classification: O47, E21, E31, E51, N17

Abstrak: Penelitian ini bertujuan untuk menguji hubungan dinamis antara pertumbuhan, inflasi, dan keseimbangan uang riil di Komunitas Ekonomi Negara-negara Afrika Barat (ECOWAS). Kami menerapkan pendekatan baru dengan memperluas metode ekonometrik yang komprehensif sehingga dinamika moneter dapat dipahami dengan lebih baik di sub-kawasan Afrika Barat. Studi tersebut memperoleh data dari Bank Dunia pada tahun 2006 hingga 2021 dan mencakup 15 negara. Untuk pemeriksaan ketahanan, kami memperkirakan kuadrat terkecil biasa yang dinamis dan kuadrat terkecil biasa yang dimodifikasi sepenuhnya. Temuan ini mengungkapkan adanya hubungan kointegrasi yang signifikan antara pertumbuhan, keseimbangan riil, dan inflasi. Lebih lanjut, studi ini menemukan bahwa keseimbangan riil mempunyai dampak dinamis jangka panjang yang positif terhadap pertumbuhan. Demikian pula, terdapat dampak positif jangka pendek dari uang dan inflasi terhadap pertumbuhan. Kami berkontribusi pada literatur mengenai hubungan pertumbuhan uang dengan berfokus pada Afrika Barat, yang menghadapi kerentanan makroekonomi akibat ketidakseimbangan struktural. Temuan-temuan ini mempunyai implikasi kebijakan bagi bank sentral dan Badan Fiskal. Bank Sentral harus berkolaborasi untuk mengurangi uang di sektor informal, sementara Otoritas Fiskal harus mengendalikan inflasi secara kolektif.

Kata kunci: pertumbuhan, inflasi, saldo riil, uang beredar, ECOWAS

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1. INTRODUCTION

Economic progress and prosperity depend largely on economic growth, which is determined by the stability of macroeconomic principles and the effectiveness of microeconomic operations. Money and the real sector are very important for growth. The 15-member Economic Community of West African States (ECOWAS) is currently facing dynamically unstable macroeconomic conditions due to rising prices, shallow financial resources and a weak fiscal position (Sylla, 2022). To overcome these challenges, ECOWAS aims to maintain a balance between the financial sector and the real sector (Ekpo, 2020). To achieve monetary integration, member countries must address fiscal and monetary imbalances according to benchmarks (Onyebuchi Obi et al., 2015). Inflation is a significant problem in every economy, especially in the wake of the COVID-19 pandemic. Price stability and sustainability is an important component of macroeconomic policy, and monetary supply is an important tool for stabilizing the economy by ensuring low inflation and high economic growth (Chaitip et al., 2015). Economic theory predicts that growth, real balance, and inflation are all related to each other. Studies in West Africa has examined the correlation between economic expansion and various factors. Orji et al. (2022) found that inflation has a negative impact on growth, while the money supply affects industrial and agricultural output at the sectoral level. Inflation has a negative impact on industrial production, services, and the agricultural sector. Study Sanya & Tosin (2022) revealed that money supply significantly enabled real growth in ECOWAS countries, with its impact increasing rapidly, particularly in Anglophone countries, compared to Francophonie countries, ranging from 50% to 72%.

Figure 1 depicts fluctuations in inflation and real growth in ECOWAS from 2007 to 2021. The figure shows how the Financial Crisis of 2007 suppressed ECOWAS real growth and slowed the inflationary spiral in 2009. In this year, the region experienced negative real GDP growth reaching -13%. This is partly due to the impact of the Financial Crisis on the ECOWAS economy. Between 2010 and 2014, both inflation and real growth remained stable with some fluctuations in real growth. In addition, regional real growth fell sharply to its lowest level in 2016, namely -16%. On the other hand, inflation has continued to rise since 2014 and reached its peak between 2017 and 2018.
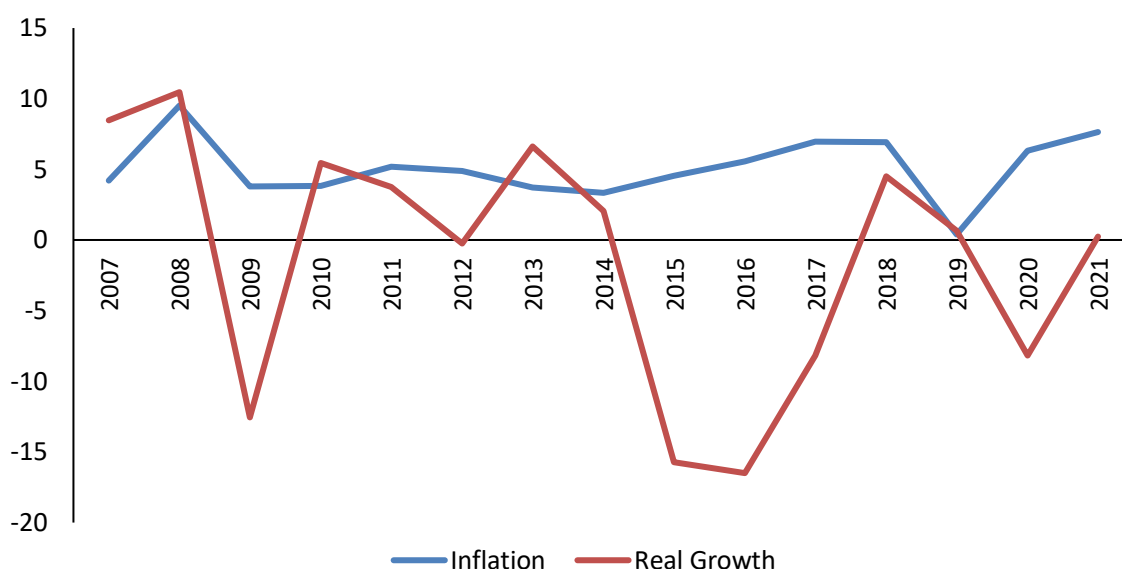

Figure 1. Inflation & Real Growth in ECOWAS
Source: WDI, World Bank (2023)

Inflation in ECOWAS was at its lowest point in 2019, which coincided with the start of the COVID-19 pandemic. At the same time, real growth declined sharply and reached a record low in 2020 due to the impact of the pandemic including lockdowns. In 2021 and beyond, the region will experience an increase in inflation and real growth. However, the graph depicts regional average inflation and real growth rates, masking the particularities of each country. Each member country

records varying levels of inflation and real growth depending on the country's macroeconomic fundamentals and policy potential.

Several related studies such as those conducted by Dada et al., (2021) found that government spending increases living standards in the ECOWAS region and reduces inflation, Additionally, Ajao & Adenomon (2023) any increase in imports, unemployment, exchange rates, and population growth rates will increase government spending in the short term and reduce inflation. According to a study conducted by Ilyas et al. (2022), the West African Monetary Zone (WAMZ) experiences the effects of shocks borne by money and exchange rates. Furthermore, Ozekhome (2017) found that the effect of money expansion causes the price level to decrease. Furthermore, Obi et al. (2015) found that in ECOWAS member countries, the money supply had a fairly large impact on inflation both in the current and previous periods. Other studies focus on SSA and other African regional groups. In this regard, Ibrahim & Alagidede (2018); and Asongu (2016) show that although financial development can reduce economic decline, it also increases the risk of economic decline in the same sector. This is caused by the elasticity of economic decline and the slow pace of credit growth. However, the risk of low investment is higher. Olamide & Maredza (2019) found that inflation triggers transmission effects throughout the monetary systems of SADC countries. Likewise, Odhiambo (2017) revealed that there is a trade-off between the money supply and inflation as well as between growth and inflation. This implies the need for stronger monetary policy to ensure monetary stability. A study conducted by Buthelezi (2023) found that output growth decreased due to an increase in the money supply. In contrast, the money supply has positive and negative shocks to inflation, depending on whether the inflation rate is low or high. By applying a threshold regression model, Baita et al. (2023) found that economic growth and inflation did not affect the money supply. In the same vein, Duodu et al. (2022) shows that the money supply reduces inflation in the Ghanaian economy by applying a vector error correction model. However, inflation results in an increase in the money supply.

Study by Thaddeus et al. (2021) found significant adverse impacts of the money supply and inflation on the country's growth trajectory in the short and long run. Additionally, Phiri (2020) found a nonlinear relationship between inflation and growth. In a single-digit inflation regime (precisely below 8%), growth provides maximum efficiency leading to improved macroeconomic health. A study conducted by Henry (2020) found that factors such as the country's monetary policy level and foreign exchange rates had a negative and significant impact on inflation, but a higher money supply had a favorable and significant impact on inflation in the country. Beyond the African context, Madurapperuma (2023) explores the growth of money inflation in Sri Lanka between 1990 and 2021. The author shows the long-run negative impact of the money supply and inflation on growth. Long et al., (2021) document the long-run balance between inflation, money, and growth in China and Vietnam. The findings show that the money supply does not affect growth, while money and growth reduce inflation in both countries. Doan Van (2020) found a significant positive long-run influence of the money supply on inflation in Vietnam. Akalpler & Duhok (2018) surveyed the Malaysian economy by analyzing the relationship between money growth. The results show a positive relationship between growth and money supply.

There have been relatively few comprehensive studies focusing specifically on the ECOWAS region as a whole. Most studies have been conducted on individual countries or smaller subsets of West African nations. Some studies have found a negative relationship between inflation and economic growth in West African countries (Yaya, 2023; Fontana and Kamara 2023; Efiom and Ubi, 2019), while others have identified a threshold effect where moderate inflation may have positive impacts up to a certain point (Piergallini, 2006; Kremer et al., 2013). However, study on the impact of real money balances on growth in ECOWAS is somewhat limited. Some studies suggest a positive relationship, but the strength and consistency of this relationship across the region remain unclear (Tijani, 2014). Recently, there's been an ongoing debate about the effectiveness of monetary policy in promoting growth within ECOWAS, given the diverse economic structures and development levels of member countries, especially after attaining political independence. Studies such as Ekpo (2014) has examined how monetary coordination efforts within ECOWAS (such as plans for a common currency) might impact the trade liberalization and economy in the region. The key

question that remains unanswered from the literature is how the dynamic impact of inflation and real money balances affect economic growth in the regions.

This study aims to fill the gaps in previous studies. This study contributes to the formulation of good inflation control policies, which are aligned with optimal monetary policy to stimulate real growth in the region. This background requires revealing the relationship between inflation and real growth, as well as between the money supply and real growth in the ECOWAS region. Thus, the aim of this study is twofold. First, to explore the dynamic impact of inflation on real growth in the West African region under the ECOWAS umbrella. Second, analyze the dynamic influence of real money balances on real growth in ECOWAS. In our second section, we explore research methods. In the third section, we present the findings and discussion. Finally, we formulate conclusions and implications of the findings and offer policy recommendations for policymakers and stakeholders.

2. RESEARCH METHODS

2.1. Data

To fulfill its research goals, the study uses secondary data. The World Development Indicators, which are made up of multiple datasets on macroeconomics, social, demographic, and other development-related topics, are the data source. The World Bank oversees maintaining the website, which is open to the public and offers World Development Indicators for more than 180 nations. Between 2006 and 2021, we gathered information on the GDP, broad money supply, lending rate, and consumer price index. We use the World Bank's definition of research variables (2023). The total value of various financial assets held outside of banks is known as the broad money supply (BM), also known as the money balance. These assets include traveler's checks, time deposits, savings accounts, foreign currency deposits held by resident sectors other than the central government, and certificates of deposit and commercial paper.

We used inflation to deflate the broad money supply because we are interested in the real money balance. An indirect measure of inflation is the consumer price index (CPI). It is frequently used to calculate the cost of living and inflation. It calculates the current price index's percentage change from the base year. GDP is a metric for gauging economic prosperity and a way to compare how rapidly economies are growing across borders. It is the total gross value added by all producers who are residents of the economy, plus any product taxes and less any subsidies that aren't factored into the product value. US dollars are the measurement's unit of measurement. Therefore, we use the GDP-to-deflator ratio to get real GDP. Natural logarithms of real GDP and broad money are used in the model to reduce variance and normalize the data with other variables. A brief explanation of variable measures is provided in Table 1.

Table 1. Variable Measurement

Symbol	Descriptions	Source
LBM	Natural log of M2 as the ratio of GDP	WDI 2023
CPI	Relative change in price index (%)	WDI 2023
LRGDP	Natural log of real GDP	WDI 2023

Source: Authors' Compilations

We used as a sample for this study 15 countries that form economic integration, namely Benin, Burkina Faso, Cabo Verde, Ivory Coast, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo.

2.2. Model Specification

To model the complex relationship between output, prices, and money supply, many theories and empirical studies mainly rely on Fisher's quantity theory. A strong basis for comprehending the interplay of money, prices, and output is provided by this theory. Our study takes a similar route to the numerous theories and models that have expanded upon or modified Fisher's theory over time to meet their own goals. In our study, we draw inspiration from Fisher's cash transaction approach,

which employs the equation of exchange: $PT = MV + M^cV^c$ where p is the general price level or the value of money 1/p. T denotes the total economy's output exchanged for money, *M* signifies the total quantity of money circulating in the economy, V represents the velocity of circulation, M^c indicates the quantity of credit money and V^c stands for circulation velocity associated with credit money. To find out the effect of prices and money balances on output, then $T = \frac{MV + M^cV^c}{P}$. According to Fisher, the output varies directly with the quantity of money provided that the velocity of money and volume of trade remains constant. We however based on these relations specify the following linear model.

$$LRGDP_{it} = f(LBM_{it}, CPI_{it}, \in_{it}) \tag{1}$$

$$LRGDP_{it} = \delta_0 + \delta_1 LBM_{it} + \delta_2 CPI_{it} + \in_{it} \tag{2}$$

where, *LRGDP* denotes the natural logarithm of real GDP. *LBM* represents the natural logarithm of real money balance. *CPI* corresponds to the consumer price index. The parameters of the model are denoted as δ_0, δ_1, δ_2 is the intercept. δ_1 and δ_2 are the coefficients for LBM and CPI respectively. $\in_{it}$ is the uncorrelated error term. The subscripts i and t are used to distinguish cross-section and time dimension respectively.

In estimation, we begin by performing the preliminary test comprising descriptive statistics, correlation matrix, and panel unit root as this assists in observing the characteristics of the variables and nature of data before selecting appropriate estimation techniques. In this research, we utilized two-panel unit root tests, Im & Pesaran (2003) and Levin & Lin, (2002). Panel unit root test helps to ensure that none of the series in the model is integrated of order higher than one. This is the precondition for applying the autoregressive distributed lag model as extended by Pesaran et al., (2001). Once our variables are integrated of order one, zero, or mixture of *I*(1) and *I*(0) and cointegrated using the conventional panel cointegration test, then it becomes necessary to employ mean group (MG), pooled mean group (PMG) and dynamic fixed effect (DFE) models to estimate the short run and long run coefficients. For the cointegration test, three different methods are employed, namely; Kao (1999) Pedroni (2004), and Westerlund (2007). To further check for the robustness of the panel ARDL model, we estimate the dynamic ordinary least square (DOLS) and fully modified ordinary least square (FMOLS). The equation of the long run, short run panel ARDL is specified below;

$$\Delta lrGDP_{it} = \beta_0 + \sum_{i=1}^{p} \beta_{1i}\Delta lrGDP_{it-i} + \sum_{i=1}^{q} \beta_{2i}\Delta LBM_{it-i} + \sum_{i=1}^{q} \beta_{3i}\Delta CPI_{it-i} +$$
$$\gamma_{1i}lrGDP_{it-1} + \gamma_{2i}LBM_{it-1} + \gamma_{3i}CPI_{it-1} + ECT_{it-1} + \cup_{it} \tag{3}$$

In equation (3), β_0 is the intercept of the constant term, while $\beta_1, \beta_2, \beta_3$ are the coefficients of the short-run models, $\gamma_1, \gamma_2, \gamma_3$ are the coefficients of the long-run models, ECT_{it-1} is the error correction term or speed of convergence term and lastly, $\cup_{it}$ is the white noise error term. Equation (3) is estimated using mean group, pooled mean group, and dynamic fixed effect estimators. To select the efficient and optimal model among the three, we use the Hausman test.

3. RESULTS AND DISCUSSION

Within this section, we present the comprehensive outcomes of the estimation process and provide in-depth interpretations of the coefficients. The analysis encompasses a range of essential elements, including summary statistics, correlation matrices, panel unit root tests, cointegration tests, MG, PMG, and DFE methods, as well as DOLS and FMOLS estimates. These diverse analyses collectively offer a robust understanding of the relationships and dynamics within the model under investigation.

3.1. Descriptive statistic and correlation matrix

Table 2 presents the summary statistics of the variables under investigation. However, the mean value of the log real gross domestic product is approximately 18.35, indicating the average value of the variable across the observations. The standard deviation (approximately 1.59) measures the variability or spread of the data points around the mean. While the minimum and maximum values (15.62 and 22.19) give the range within which the observations fall. The average value for the real balance proxy by the ratio of broad money to inflation stood at approximately 27.45 for the panel of ECOWAS, while the standard deviation away from the mean is approximately 2.24. the minimum and maximum observations for the whole samples are approximately 20.58 and 31.41 respectively. The consumer price index, used as a proxy for inflation, exhibits an average value of about 114.19, with a standard deviation of approximately 39.12. Among the observed samples, the inflation rate ranges from a minimum of 66.44 to a maximum of 354.30.

Table 2. Descriptive Statistics

Descriptive	LRGDP	LBM	CPI
Mean	18.355	27.451	114.191
Min.	15.617	20.575	66.436
Max.	22.189	31.411	354.296
Std. dev	1.595	2.242	39.118
Obs.	176	176	176
LRGDP	1.000	-	-
LBM	0.802	1.000	-
CPI	0.160	0.095	1.000

Source: Authors' calculations

Table 2 also reports the correlation coefficients between variables. It could be seen that there is a strong positive correlation between economic growth proxy by the real GDP and real balance. The correlation between real GDP and inflation is positive and weak. Similarly, the correlation between real balance and inflation is positive but very weak.

3.2. Panel Unit Root and Cointegration Results

We employ the panel unit root tests proposed by Levin et al. (2002) and Im & Pesaran (2003), and the results are reported in Table 3. The series are all examined for stationarity at the level and first difference. The log of real GDP is found to be stationary at the level as we reject the null hypothesis at the 1% level. In the same vein, real balance is a stationary series at the conventional level. However, the consumer price index is nonstationary data but its first difference has no unit root. Since the stationarity check for the variables yields mixed outcomes, this necessitates testing for cointegration among the variables.

Table 3. Results of Panel Unit root

Variables	Level		First difference	
	IPS-test	LLC-test	IPS-test	LLC-test
LRGDP	-4.137*	-3.755*	-5.498*	-9.831*
LBM	-2.203**	-3.939*	-5.535*	-4.140*
CPI	-0.278	-3.242*	-4.471*	-4.221*

Note: ***, **, and *indicate significance at the 1%, 5%, and 10% levels, respectively. Null: panel contains a unit root
Source: Authors' calculations

Three different tests of cointegration are reported in Table 4, Kao (1999) produces five statistics, each pointing to the cointegration or otherwise. It could be inferred from Table 4 that all the statistics confirm long-run movement among the variables because we reject the null hypothesis at the 1% level. Two statistics from Pedroni's (2004) approach confirm cointegration, while both statistics in the case of Westerlund (2007) established a long-run relationship among the variables

with 99% confidence interval for some panels and 95% confidence in the case of all panels respectively.

Table 4. Results of Panel Cointegration Test

Kao test	t-statistics	Summary
Modified DF	-3.782*	Cointegrated
DF	-2.929*	Cointegrated
ADF	-3.533*	Cointegrated
Unadjusted Modified Df	-3.648*	Cointegrated
Unadjusted Df	-2.886*	Cointegrated
Pedroni test		
Modified PP	0.455	No cointegration
PP	-2.545*	Cointegrated
ADF	-2.357*	Cointegrated
Westerlund test		
VR	-2.409*	Some panels are cointegrated
VR	-1.997**	All panels are cointegrated

Note: ***, **, and *indicate significance at the 1%, 5%, and 10% levels, respectively.
Source: Authors' calculations

4.3. Dynamic Analysis of Real Balance and Inflation Impact on Growth in ECOWAS

Finding the model with the least amount of asymptotic variance, or the efficient estimator among MG, PMG, and DFE, requires a lot of intuition. Hausman (1978) cited in Shahram et al., (2012) put forward a specification test that allows for choosing a model that minimizes variance. At the bottom of Table 5, Hausman statistics reject the null of MG and DFE respectively. We conclude that the PMG model is the best model for this study. However, after comparing the three models, it became clear that there aren't many differences between them in the both short run and long-run. The detailed results in Table 5, revealed the dynamic impact of real balance and inflation on economic growth, shedding light on crucial insights for the region. The long-run coefficients demonstrate that real money balance has a major and favorable impact on economic expansion. When effectively utilized while keeping other factors constant, these balances stimulate effective demand, thereby signaling investments and triggering the multiplier effect, resulting in overall economic growth.

Table 5. Results of the Model Specifications

Dependent Variable: LRGDP						
Variables	**MG**		**PMG**		**DFE**	
	Long run	Short run	Long run	Short run	Long run	Short run
Constant	-	10.407	-	4.515*	-	4.515*
LBM	0.162**	-0.164	0.296*	-0.064	0.257	-0.014
CPI	0.002	0.005	0.001	0.009**	-0.007	0.002
Hausman	MG VS. PMG (CHI = 2.58), PMG VS. DFE (chi = -75.54)					

Note: ***, **, and *indicate significance at the 1%, 5%, and 10% levels, respectively.
Source: Authors' calculations

Although not statistically significant, we find a positive correlation between inflation and economic growth. This observation aligns with one school of thought in the literature. Economists in this group contend that predictable and gradual price increases foster a conducive climate for healthy economic growth. They argue that low inflation has a relatively minor impact on long-term productivity and economic growth. Given that many economies within ECOWAS are grappling with achieving meaningful economic growth amid inflation challenges, a prudent approach would be to allow the general price level to rise within single digits. This measure may strike a balance, as it recognizes the positive aspects of inflation while mitigating its potential drawbacks. The short-run

dynamics of the PMG model revealed that the negative impact of real balance on economic growth is not statistically significant. Meanwhile, inflation maintains a long-run positive and significant relationship with growth in the short run.

Table 6. Countries Specific Short-run Dynamics

Countries	Constant	LBM	CPI	ECT	Summary
Benin	7.626*	0.629*	-0.001	-0.734*	Real balance (+) inflation (-)
Burkina Faso	6.628*	-0.898*	0.018*	-0.625*	Real balance (-) inflation (+)
Carbo Verde	5.390*	0.904	0.034*	-0.588*	Real balance (+) inflation (+)
Cote D'Ivoire	6.655**	-0.032	0.005	-0.581**	Real balance (-) inflation (+)
Guinea Bissau	1.457	0.103	0.013*	-0.177	Real balance (+) inflation (+)
Mali	6.119**	-0.172	0.008	-0.610*	Real balance (-) inflation (+)
Niger	3.329***	0.111	0.014*	-0.319***	Real balance (+) inflation (+)
Nigeria	6.931**	0.042	-0.014**	-0.514**	Real balance (+) inflation (-)
Senegal	6.445*	-0.404	0.010***	-0.598*	Real balance (-) inflation (+)
Sierra Leone	2.442	-0.012	-0.010	-0.227	Real balance (-) inflation (-)
Togo	10.150	-0.975**	0.022**	-1.022*	Real balance (-) inflation (+)

Note: ***, **, and *indicate significance at the 1%, 5%, and 10% levels, respectively.
Source: Authors' calculations

These results highlight how crucial it is to keep the region's real money balance, inflation, and economic growth in check. By effectively managing these factors, policymakers can foster a climate that encourages sustainable economic growth and development. To provide further validation for the PMG estimations, we conducted DOLS and FMOLS, and the results are presented in Table 7. Both DOLS and FMOLS analyses confirm a positive and significant relationship between real balance and economic growth in the ECOWAS region. However, it was observed that inflation has a significant and inverse relationship with economic growth in the long run. The models explanatory power, as indicated by the coefficient of determination, is high, indicating a strong fit of the model. The regressors exert a substantial influence on the predictor variable, reinforcing the model's reliability and effectiveness.

Table 7. Robustness Checks

	DOLS		FMOLS	
	Coefficient	Std. error	Coefficient	Std. error
LBM	0.216*	0.034	0.283*	0.024
CPI	-0.001	0.001	-0.005*	0.000
	$R^2 = 0.999$	Adj. $R^2 = 0.998$	$R^2 = 0.997$	Adj. $R^2 = 0.996$

Note: ***, **, and *indicate significance at the 1%, 5%, and 10% levels, respectively.
Source: Authors' calculations

4.4. Discussion

The core of the research is to examine the link between growth, real balances, and inflation. The findings revealed a significant cointegration relationship among growth, real balances, and inflation. This implies that growth, real balances, and inflation are interconnected such that the

monetary sector has a spillover effect on the real sector of the economy. Intuitively, an increase in money supply has a positive consequence on output via the increase in investment. An increase in money supply lowers interest rates, which leads to a rise in output. Thus, the research findings suggest long-run equilibrium relationship between the real sector and monetary sector. Furthermore, we are interested in finding the dynamic impact of real balances and inflation on growth in the region. This is important because monetary policy and price level bear policy implications for developing economies.

Consequently, the results reveal that real balance has a positive long-run dynamic impact on growth. This highlights the significance of designing optimal monetary supply growth to reactivate economic performance. Though Central Banks focus on monetary policy operations in ECOWAS, they should accord equal importance to the money growth to realign with growth-enhancing policies. This is in line with Olamide and Maredza (2019) who document the positive connection between money and growth in the SADC zone. Contrarily, Buthelezi (2023) and Thaddeus, et al. (2021) found negative interconnection between real balance and growth. Buthelezi (2023) observes that expanding the money supply has adverse implication for growth.

Despite the short-term positive effect of money on growth in Africa, empirical evidence confirmed the money neutrality thesis over the long period (Asongu, 2016). Though growth did not respond to real balance as suggested by Orji, et al. (2022), the authors found significant negative efficacy of real balance on both agricultural and industrial outputs in the ECOWAS zone. The efficacy of contrasting findings spotlights the need to analyze the optimum level at which real balances trigger growth. Though real balance promotes economic growth, it may have adverse outcomes when exceeding a certain threshold. Thus, each country in the ECOWAS region should not over ambitiously rely on monetary policy to upscale growth; in fact, caution is in order.

Additionally, inflation shows a significant short-run positive impact on growth based on the PMG model. This finding aligns with recent works (Ajao & Adenomon, 2023; Olamide & Maredza, 2019). Ajao & Adenomon (2023) established the facilitative outcome of inflation on Nigeria's GDP growth. In contrast, Odhiambo (2017) documented the trade-off interrelationship between growth and inflation. Likewise, Orji, et al. (2022) reveal that inflation negatively affects sectoral output in agriculture, industry and service. As evidence of mixed outcomes, Phiri (2020) found that inflation accelerates growth below the 8% threshold; however, growth decelerates as inflation approaches double digits.

Thus, these divergent findings indicate the knife-edge effects of inflation. At lower and medium bounds (i.e. single digit rate), inflation is consistent with a growing economy. Invariably, growing economies are likely to experience inflationary pressure. Yet, if inflation is tamed while the economy sustains growth, it is likely that a country will experience robust economic performance. This scenario could support the empirical evidences documented by Ajao & Adenomon (2023). In Table 2, the mean growth rate for ECOWAS is 18.35%, while average consumer price index is 114.19. The region records impressive average annual growth with low inflation between 2006 and 2021. Plausibly, this is why inflation positively connects with growth over the long period.

However, evidence at the country level supports Odhiambo (2017) trade-off thesis. The country-specific short-run analysis insightfully shows the trade-off connection between inflation and growth in Benin, Nigeria, and Sierra Leone. In these countries, inflation has a negative impact on growth. Thus, inflation facilitates and enhances growth in the ECOWAS region; however, it puts downward pressure on economic performance in countries with high inflation rates. When inflation toes on double digit, it downsize the positive effect of real balances and ultimately dwarfs growth at a country level. The case in point are Benin and Nigeria, which have positive effect of real balance but inflation turns out to exert negative impact on growth.

6. CONCLUSIONS

This study has thoroughly examined the complex interrelationships among economic growth, real money balances, and inflation within the ECOWAS member countries over the period 2006-2021. Our comprehensive analysis has yielded several significant findings that contribute to the understanding of monetary dynamics in West Africa. Firstly, our research establishes a robust long-

run equilibrium relationship among growth, real balances, and inflation in the ECOWAS region. This finding underscores the intricate and enduring connections between these key macroeconomic variables, highlighting the importance of considering their joint dynamics in policy formulation. The overall model, based on the Pooled Mean Group (PMG) estimator, reveals that real money balances have a significant growth-enhancing effect in the long run. This suggests that maintaining appropriate levels of liquidity in the economy can foster sustained economic growth over time. Conversely, inflation demonstrates a significant positive impact on growth in the short term, indicating that moderate levels of inflation may stimulate economic activity in the immediate future.

However, our country-level analysis uncovers notable heterogeneity in the short-run dynamics across ECOWAS nations. Real balances are found to boost growth in Benin, Cabo Verde, Guinea-Bissau, Niger, and Nigeria, suggesting that monetary expansion in these countries may be an effective tool for short-term economic stimulation. In contrast, real balances exert a short-term negative impact on growth in Burkina Faso, Côte D'Ivoire, Mali, Senegal, Sierra Leone, and Togo, indicating that these economies may be more sensitive to the potential distortionary effects of monetary expansion. Regarding inflation, our findings reveal that its short-term impact remains consistently growth-enhancing in the majority of ECOWAS countries. This supports the notion that moderate inflation can stimulate economic activity by encouraging spending and investment. However, exceptions are observed in Benin, Nigeria, and Sierra Leone, where inflation appears to have a negative effect on growth, highlighting the need for careful inflation management in these economies.

Therefore, the study offers policy implications for policymakers and economic managers. First, the ECOWAS Central Banks should realize that monetary expansion is not sufficient for a vibrant economy. They have to ensure that most of the monies in circulation are under control of Central Banks. This is important because the expansion of money may be counterproductive if a large share of money is not under control. This will undermine the role of money in fostering economic growth in the region. Second, the rate of real balance growth should be proportional to the rate of economic activities. Money supply could undermine growth when it is more than economic capacity. Consequently, the benefit of upscaling economic performance will be counteracted in the presence of a mismatch between real balance growth and economic growth. Such a situation will lead to unintended consequences such as policy impotency and economic instability. Third, low inflation is growth-friendly although hard to maintain in developing countries suffering structural problems. Therefore, ECOWAS should synchronize fiscal and monetary policies at the regional level to mitigate inflationary pressure. This will reduce the spillover effect of cross-border inflation within the region, and enhance economic buoyancy. Fourth, ECOWAS should target a low inflation regime collectively. ECOWAS should initiate an "inflation intervention fund" to assist members during unusual inflation episodes. Conditional on the arrangements, members encouraging fiscal profligacy should not access the "intervention fund" until they revert to fiscal discipline. This measure will encourage members to pursue growth-friendly policies, thereby promoting economic prosperity in the ECOWAS zone.

Future research could further explore the underlying causes of these country-level differences and investigate how regional policies can be designed to accommodate this heterogeneity while still promoting overall economic integration and stability in ECOWAS. Additionally, examining how these relationships evolve over longer periods and in response to external shocks could provide valuable insights for enhancing the resilience of West African economies.

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