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ASSESSING THE IMPACT OF DOMESTIC CREDIT ON ECONOMIC PERFORMANCE IN GHANA: AN INSTRUMENTAL VARIABLE MODEL

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Domestic credit growth has remained a central policy concern in Africa, where financial deepening is often accompanied by structural inefficiencies that limit its contribution to sustainable development. In Ghana, despite persistent credit expansion, questions remain as to whether this growth fuels productive investment or merely supports consumption and fiscal imbalances. This study examines the impact of domestic credit on economic performance in Ghana, engaging the debate on whether credit expansion serves as an enabler of growth or a constraint. The precise effect of credit on real GDP per capita remains ambiguous, partly due to endogeneity and reverse causality. Using a Two-Stage Least Squares (2SLS) instrumental variable approach over the 1984-2023 period, the analysis employs broad money supply as an instrument for domestic credit while controlling for gross capital formation, government expenditure, inflation, and trade openness. The findings reveal a significant bidirectional relationship between credit and growth, indicating that credit expansion alone does not guarantee sustained performance without addressing inefficiencies in allocation. The results further show that government expenditure and trade openness enhance growth, while inflation has a negative effect. This study concludes that financial sector reforms, improved credit targeting, prudent fiscal management, and strengthened trade competitiveness are critical for maximising the developmental impact of domestic credit in Ghana.

Keywords: **Domestic credit; Economic performance; Endogeneity; Financial sector reforms; Two-Stage Least Squares (2SLS)**

JEL Classification: **E44, E51, O16, O40, C36**

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1. Introduction

Economic performance remains a central policy priority for Ghana, particularly in the wake of recent fiscal imbalances and its ongoing collaboration with the International Monetary Fund (IMF). The governments' current reform agenda, supported by the IMF's Extended Credit Facility, seeks to restore macroeconomic stability, reduce debt vulnerabilities, and promote inclusive growth (IMF, 2023). Ghana's GDP growth rebounded to 5.7 per cent in 2024 from 3.1 per cent in 2023, driven by strong industry and services performance, yet inflation persisted at nearly 24 per cent by year-end, underscoring structural fragilities (World Bank, 2025). These challenges highlight the need to understand how financial and macroeconomic variables, particularly domestic credit, interact with growth outcomes.

Domestic credit plays a pivotal role in shaping economic performance. In principle, access to credit enables investment in physical and human capital, spurring productivity and innovation. The Neo-Classical Growth Model emphasises the importance of capital accumulation for long-run output, implying that greater credit availability should support growth (Solow, 1956; Barro, 1991). The Endogenous Growth Theory, however, stresses that growth depends not only on the volume of credit but also on its efficient allocation and the institutional context in which it operates (Romer, 1990; Lucas, 1990). Similarly, the McKinnon-Shaw Hypothesis argues that financial liberalisation and deeper intermediation expand credit markets, reduce distortions, and enhance growth (McKinnon, 1973; Shaw, 1973). These contrasting perspectives underscore the importance of empirically examining how credit functions in Ghana's financial system.

Empirical studies on Ghana's finance-growth nexus have so far produced inconclusive results. For example, a recent work (see Appiah-Otoo & Song, 2022) employing Auto-Regressive Distributive Lag (ARDL) and Fully Modified OLS (FMOLS) approaches reports that broad money supply and domestic credit exert negative effects on growth (Alaba, Ahmed et al., 2024). Similarly, nonlinear threshold models reveal that while financial deepening promotes growth up to a certain level, excessive expansion beyond that threshold may harm economic performance (Gyamfi et al., 2022). By contrast, other studies applying ARDL and Granger causality frameworks find that domestic credit is positively related to GDP, though causality frequently runs from growth to credit rather than the reverse (Ofori-Abebrese et al., 2017). This divergence reflects both method-based limitations and country-specific conditions, leaving the finance–growth relationship unsettled.

Addressing these gaps requires method-based rigour. Traditional Ordinary Least Squares (OLS) estimates are vulnerable to endogeneity bias, arising either from reverse causality, where higher growth stimulates credit expansion, or from omitted variable bias. To overcome this, the present study adopts an Instrumental Variable (IV) strategy, specifically Two-Stage Least Squares (2SLS), using broad money supply as an instrument for domestic credit. This

approach isolates exogenous variation in credit supply, thus producing more reliable estimates of its impact on economic performance (Semwenda, 2023).

This study makes three contributions to the literature. First, it provides up-to-date country-specific evidence on Ghana, where domestic credit growth remains robust, averaging 18.8 per cent year-on-year as of November 2024 (CEIC, 2024). Second, it enhances method-based precision by employing an IV approach to address endogeneity concerns overlooked in many Ghanaian studies. Third, it integrates a comprehensive set of macroeconomic controls, including gross capital formation, government expenditure, inflation, and trade openness, to isolate the net impact of credit on GDP per capita. These controls are particularly relevant, as Ghana's gross capital formation rose sharply from GHS 85,671 million in 2023 to GHS 115,227 million in 2024 (Ghana Statistical Service, 2024), reflecting intensified capital deepening. Evidence from other developing economies highlights that such investment, when effectively financed, is a critical driver of long-term growth (Ahamed, 2021).

Taken together, the unresolved empirical debate, the method-based shortcomings of prior studies, and the policy urgency of financial reform in Ghana underscore the importance of revisiting the credit-growth nexus with stronger empirical tools. This study, therefore, seeks to clarify whether domestic credit in Ghana serves as an engine of growth or a constraint, and under what macroeconomic conditions its growth effects materialise.

This study contributes by providing IV-based, Ghana-specific evidence on the credit-performance nexus over 1984-2023, directly addressing endogeneity with 2SLS and an instrument grounded in monetary liquidity. Relative to the existing Ghanaian literature dominated by OLS/ARDL, we isolate exogenous credit variation and benchmark the effect after controlling for gross capital formation, government expenditure, inflation and trade openness.

The aim is to quantify the causal effect of domestic credit on real economic performance in Ghana and to evaluate how macro-fiscal and external openness conditions shape that effect. The scope covers annual national data from 1984 to 2023 drawn from internationally harmonised sources (WDI). Ghana is an instructive case because it combines persistent credit expansion with episodes of macroeconomic instability and structural reform (e.g., financial liberalisation, IMF-supported programmes). These features provide a rich setting to examine whether credit deepening translates into performance gains or is dampened by allocation inefficiencies.

We test the following hypotheses: H1: Δdc_ps has a significant effect on Δrgdp_pc. H2: Government expenditure and trade openness are positively associated with Δrgdp_pc. H3: Inflation is negatively associated with Δrgdp_pc. H4: The sign and magnitude of the credit

effect hinge on allocation efficiency and macroeconomic stability, implying potential sign reversals under misallocation or high inflation.

Structurally, this study proceeds as follows: theoretical and empirical literature review (Section 2) surveys Ghana-specific and regional findings on credit, inflation, government spending, trade, and investment; the Methodology (Section 3) details the data sources and empirical approach, including endogeneity handling; the Results and Discussion (Section 4) interprets the key findings in light of theory and prior evidence; and the Policy Implications and Recommendations (Section 5) distil robust, evidence-based strategies to harness the growth potential of Ghana's financial and macroeconomic framework.

2. Theoretical Literature Review

2.1 Neo-Classical and Endogenous Growth Theories

This study on the relationship between domestic credit and economic performance in Ghana is anchored in both the Neo-Classical Growth Theory and the Endogenous Growth Theory. The Neo-Classical Growth Theory, as developed by Robert Solow and Trevor Swan, posits that economic performance is largely a function of capital accumulation, labour force expansion, and technological progress (Solow, 1956; Swan, 1956). Within this framework, access to domestic credit is essential because it enables the mobilisation and allocation of financial resources for productive investments. Banks and other financial intermediaries that extend credit facilitate the acquisition of physical capital, support business expansion, and enhance labour productivity, key drivers of growth outlined by this theory. In the context of Ghana, efficient domestic credit systems can accelerate capital formation and initial growth spurts. Studies such as King and Levine (1993), as well as Al-Mamun (2018), have applied the neo-classical perspective to demonstrate that financial development, embodied in improved domestic credit, directly promotes economic performance by increasing capital investments and supporting the adoption of productive technologies.

On the other hand, the Endogenous Growth Theory, championed by Romer (1990) and Robert Lucas Jr. (1990), shifts the focus to internal factors within the economy, namely innovation, technological change, and human capital development, as primary engines of sustained long-term growth. For this theory, domestic credit is not only a source for fixed capital but also an enabler of investments in research and development, innovation, and skills enhancement. In Ghana, accessible and affordable credit fosters entrepreneurship, supports technological upgrading, and enables new business models, all of which stimulate productivity and generate knowledge spillovers across the economy. Pioneering studies by Romer (1990), Lucas (1990), and empirical work by Schumpeter (1911) and Goldsmith (1959) provide evidence that comprehensive financial development and expanded credit availability are crucial for ongoing innovation-led growth.

2.2 The McKinnon–Shaw Financial Liberalization Hypothesis

This line of thought was pioneered by Ronald I. McKinnon (1973) and Edward S. Shaw (1973), who argued for the removal of financial controls to allow interest rates to be determined by market forces. According to their hypothesis, liberalised interest rates enhance competition and efficiency in financial markets, resulting in higher real interest rates. In turn, these higher returns are expected to stimulate savings, broaden the pool of loanable funds, and improve the allocation of credit toward the most productive investment opportunities.

In Ghana, comprehensive liberalisation policies implemented during the 1980s and 1990s, such as the deregulation of interest rates, relaxation of credit ceilings, and greater autonomy for the banking sector, were designed to address past financial distortions and revitalise the credit market. By expanding access to domestic credit, these reforms sought to reduce the cost of capital and facilitate increased private sector investment, thus fostering capital accumulation, accelerating technological adoption, and stimulating overall economic performance.

Grounded in the McKinnon-Shaw framework, the present study empirically examines whether the post-liberalisation growth in domestic credit has translated into measurable improvements in Ghana's real GDP per capita. Recognising the possibility of endogeneity between credit expansion and economic performance, the analysis employs instrumental variable estimation techniques to establish causality. This method-based approach provides more reliable evidence on the extent to which financial liberalisation–induced credit expansion has contributed to Ghana's economic performance.

2.3 Empirical Literature Review

Empirical evidence on the relationship between economic performance and key macroeconomic factors such as domestic credit, government expenditure, gross capital formation, inflation, and trade openness presents a complex picture, often varying by country context and methodology. Studies focusing on domestic credit reveal a generally positive association with economic performance in Ghana and Nigeria. Ofori-Abebrese et al. (2017) confirmed that private-sector credit stimulates GDP growth through enhanced productive investment in Ghana, with causality flowing bidirectionally between credit and growth. Similarly, Yerima and Idris (2023) found that credit contributes significantly to output expansion in Nigeria, albeit with short-run effects that require structural reforms for sustainable impact. However, Sarpong and Nketiah-Amponsah (2022) cautioned that while credit deepening boosts GDP in Sub-Saharan Africa, it may not yet translate into inclusive growth, highlighting the need to examine the quality alongside quantity of credit.

Empirical evidence on the role of gross capital formation in economic performance presents mixed but context-specific outcomes across developing economies. Aslan and Altinoz (2021),

in a multi-continental analysis using a panel VAR model, found that while natural resources and globalisation generally stimulate growth, the effect of capital formation varies by region-negative in some continents but positive in Africa. In Nigeria, Gbenga and Chibuzor (2023) reported that gross fixed capital formation and foreign direct investment exerted no significant impact on growth, whereas national savings significantly boosted GDP, underscoring the importance of domestic savings as a channel for capital formation. By contrast, Chindengwike (2025), examining Tanzania through a Vector Error Correction Model, established a strong positive association between gross capital formation and economic performance, alongside a supportive role of government expenditure. Collectively, these findings suggest that while capital formation can be a powerful driver of growth, its effectiveness depends on the structure of the economy, the quality of investments, and the extent to which domestic savings and supportive fiscal policies are mobilised. The role of government expenditure in growth remains debated, with some studies identifying positive effects (Nor & Yusof, 2025; Poku et al., 2022; Nyarko-Asomani et al., 2019), while others report negative or insignificant outcomes (Aydin & Esen, 2019; Barlas, 2020). Ghana-specific evidence suggests capital expenditure fosters growth, whereas recurrent spending can be detrimental. Similarly, other investigations (Katushabe, 2024; Yossinomita et al., 2024) underscore the growth-enhancing potential of well-targeted government spending, particularly below certain thresholds.

Inflation generally imposes a drag on growth, especially when high or volatile (Attafuah et al., 2025; Su & Soon, 2024). However, moderate inflation can sometimes stimulate GDP, underscoring the nuanced inflation-growth nexus shaped by structural and policy environments. In Ghana, persistent inflationary pressures call for strong monetary management to ensure macroeconomic stability.

Trade openness exhibits a predominantly positive influence on economic performance across West African and emerging markets. Oppong-Baah et al. (2022), Wiredu et al. (2020), and Raghutla (2020) consistently find that openness facilitates GDP growth by enhancing market access, technology transfer, and competition. Nonetheless, some evidence from Adu-Gyamfi et al. (2020) points to potential adverse effects under certain conditions, indicating that trade policies must be carefully managed to sustain positive outcomes.

In sum, the empirical literature affirms that domestic credit, government expenditure, capital formation, inflation, and trade openness collectively shape economic performance, but their effects are mediated by country-specific factors, the quality of economic management, and the institutional environment. This highlights the imperative for integrated macroeconomic and financial policies to harness these factors effectively for sustained and inclusive growth.

3. Methodology, Data, and Model Identification

This study investigates the effect of domestic credit to the private sector on economic performance in Ghana, using the Two Stage Least Squares (2SLS) model-building strategy spanning 1984-2023. The period of the study spans 1984 to 2023, primarily due to the range of consistent annual data available for all the selected variables. The most recent year covered is 2023, which represents the last year recorded in the database. The time frame also reflects data constraints, particularly regarding the instrumental variables. While broad money supply data were available for the entire period, the second potential instrument, bank capital-to-asset ratio, had data only up to 2017. Due to this limitation, the latter was dropped, and the analysis was restricted to the variables with complete coverage from 1984 to 2023. Economic performance is proxied by Real GDP per capita, while domestic credit to the private sector represents the core explanatory variable. Additional macroeconomic variables (gross capital formation, government expenditure, inflation, and trade openness) are included as controls.

3.1 Justification for the Use of 2SLS

In this study, domestic credit to the private sector (dc_ps) is assumed to be endogenous because it correlates with the error term in the regression model, per our test (see results and discussion). This violates the classical Ordinary Least Squares (OLS) assumption that explanatory variables must be independent of the error term, and it can make OLS estimates biased and inconsistent. While domestic credit can stimulate economic performance (rgdp_pc), it is also possible that better economic performance could lead to higher credit provision, thus creating a bi-directional causality [Simultaneity/ two-way causality] (Theil, 1953; Mogstad et al., 2021). This mutual relationship creates an endogeneity problem. And so, the 2SLS solves this by using an instrumental variable [IV] (Sargan, 1958). Thus, the variable (broad money supply [b_m]) that is selected as an instrument correlated with the endogenous regressor (dc_ps) but not with the error term (Note: the error term explains all other variables that are not in the model but latently affect economic performance). In the first stage, the endogenous variable is regressed on the instrument (b_m), and in the second stage, the predicted values are used in the main regression. This yields consistent estimates (Bollen, 1996).

The other reason for the use of the 2SLS is that the classical OLS cannot establish causality when endogeneity is present (Mogstad et al., 2021). The 2SLS enhances the credibility of causal claims by isolating the variation in the explanatory variable that is exogenous (i.e., not affected by the error term). This strengthens the argument that changes in domestic credit genuinely cause changes in economic performance, not the other way around. Since this study is aimed at informing public or financial policy, it must be based on models that account for the real-world complexity of economic relationships.

3.2 Dependent Variable and Its Justification: Real GDP per capita (rgdp_pc)

This is widely used in economic research as a proxy for economic performance and living standards [see Opoku et al. (2022), Mensah and Adukpo (2025), Agarwal and Baron (2023), Ofori-Abebrese et al. (2017). It reflects the average income per person in constant prices and captures output and population dynamics while accounting for inflation. In the context of Ghana, changes in Real GDP per capita reflect how well the economy is performing over time, especially in relation to credit growth, investment, inflation, and external openness.

3.3 Main Independent Variable: Domestic Credit to the Private Sector (dc_ps)

This measures the availability of financial resources to businesses and households. It reflects the extent to which the financial sector supports private sector development. Theoretical and empirical literature often links credit availability to capital accumulation, productivity, and growth. In this study, dc_ps is used to examine whether credit expansion contributes to improvements in economic performance in Ghana (see King & Levine, 1993; Madichie et al., 2014; Mogstad et al., 2021).

3.4 Control Variables and Their Justification

Table 1: Control Variables and Their Justification

Variable	***Description and Justification***
Gross Capital Formation (g_cf)	This variable captures the level of investment in physical assets such as infrastructure, machinery, and equipment. Gross capital formation is a critical driver of long-term economic performance because it expands the economy's productive capacity. Controlling for g_cf helps isolate the impact of domestic credit from the influence of investment activities (see Chindengwike (2025), Gbenga and Chbuzor (2023), Ntamwiza and Masengesho (2022), and Mogstad et al., 2021).
Government Expenditure (g_e)	Government expenditure represents public spending on goods and services, including infrastructure, health, education, and defence. It plays a significant role in stimulating economic activity and maintaining social stability. By including g_e, the study accounts for the effect of fiscal policy on economic performance (see Mensah & Adukpo (2025), Arawatari et al. (2023), Opoku et al. (2022), Rahman et al. (2023).
Inflation Rate (in_f)	Inflation affects the real value of money, investment decisions, and the overall economic environment. High or volatile inflation can distort economic planning and reduce the effectiveness of credit. Controlling for in_f ensures that the observed impact of credit is not confounded by price instability (e.g., Agarwal & Baron (2024), Xiong (2023), Olowofeso et al. (2022),
Variable	Description and Justification
Trade Openness (t_o)	Trade openness reflects the degree to which a country engages in international trade. It influences economic performance by enabling access to larger markets, technology transfer, and competition. Including t_o in the model accounts for external factors that may also influence GDP per capita (see Nam and Ryu (2024), Oppong-Baah et al. (2022), Raghutla (2020)

Source: Authors' computations using World Development Indicators (WDI), 1984–2023.

3.5 Variable Definitions and Acronyms

Table 2: Variable Definitions and Acronyms

Acronym	Variable Name	Description
rgdp_pc	Real GDP per capita	Real gross domestic product divided by total population; a measure of average income adjusted for inflation and used to track real economic performance.
dc_ps	Domestic Credit to the Private Sector	Financial resources provided to the private sector by financial corporations (as a % of GDP). Measures credit availability.
g_cf	Gross Capital Formation	Total investment in physical assets such as infrastructure, machinery, and equipment (as a % of GDP). Reflects productive capacity.
g_e	Government Expenditure	Total government spending on goods and services (as a % of GDP). Shows fiscal policy impact.
in_f	Inflation Rate	The annual percentage change in consumer prices. Measures cost of living and price stability.
t_o	Trade Openness	Sum of exports and imports as a percentage of GDP. Indicates how open the economy is to international trade.
b_m	Broad Money Supply	Total amount of money in circulation in the economy, including currency and various types of deposits. Indicates liquidity in the financial system.

Source: Authors' Computations- Data obtained from the WDIs 1984-2023

3.6 The Model Development Proceeds

Step 1: The foundational model assesses the direct effect of domestic credit on economic performance:

3.7 Baseline Model with Key Explanatory Variable

$$Y_{it} = \alpha_0 + \alpha_1 X_{1,it} + \mu_{it} \quad (1)$$

This equation represents the baseline relationship between Economic Performance [Real GDP Per Capita (rgdp_pc)] (Y_{it}) and Domestic Credit-to-Private Sector [dc_ps] $(X_{1,it})$, where μ_{it}captures all other unobserved influences. It tests the fundamental hypothesis that credit extended to the private sector directly impacts economic output.

3.8 Model with Control Variables (Group Notation)

$$Y_{it} = \alpha_0 + \alpha_1 X_{1,it} + \delta' Z_{it} + \mu_{it} \quad (2)$$

In model (2), denotes a vector of control variables that may also influence economic performance through domestic credit, including factors like Gross Capital Formation (g_cf), Government Expenditure (g_e), Inflation (in_f), and Trade Openness (t_o). The coefficient

vector represents their respective effects. This version allows the main explanatory variable's effect to be estimated while holding other relevant macroeconomic factors constant.

3.9 Fully Expanded Structural Model

$$Y_{it} = \alpha_0 + \alpha_1 X_{1,it} + \alpha_2 X_{2,it} + \alpha_3 X_{3,it} + \alpha_4 X_{4,it} + \alpha_5 X_{5,it} + \mu_{it} \quad (3)$$

Here, the control vector is fully decomposed:

$X_{2,it}$: Gross capital formation

$X_{3,it}$: Government expenditure

$X_{4,it}$: Inflation

$X_{5,it}$: Trade openness

This model now transparently displays each of the indirect determinants (control variables) of economic performance alongside the core (direct variable), Domestic Credit.

3.10 Empirical Model with Actual Variable Names

$$rgdp_{pc_{it}} = \beta_0 + \beta_1 dc_{ps_{it}} + \beta_2 g_{cf_{it}} + \beta_3 g_{e_{it}} + \beta_4 in_{f_{it}} + \beta_5 t_{o_{it}} + \varepsilon_{it} \quad (4)$$

This final empirical model replaces the general symbols with the actual variables in model (4). It forms the basis for estimation and testing, allowing for quantification of the marginal effects of domestic credit and other macroeconomic factors on Real GDP per capita.

3.11 First-Stage of the 2SLS Structural Model (Core Instruments Only)

Because broad money supply is the sole instrument for domestic credit, the model is exactly identified; hence, overidentification tests (e.g., Hansen J/Sargan) cannot be conducted. Instrument exogeneity, therefore, relies on theoretical plausibility. As a robustness consideration, future work could introduce additional instruments (e.g., reserve requirements, policy rate shocks, or bank capital ratios) to enable overidentification testing. Moreover, some controls (government expenditure, inflation) may themselves be endogenous. While our primary specification treats them as exogenous, subsequent research can address this with multi-instrument 2SLS or system-GMM frameworks to test the sensitivity of coefficients to alternative identification schemes.

$$X_{1,it} = \gamma_0 + \gamma_1 Z_{1,it} + \nu_{it} \quad (5)$$

Equation (5) models the potentially endogenous variable [domestic credit] as a function of an instrumental variable ([broad money supply (b_m)], with representing the error term. This

setup assumes that domestic credit is influenced by the credit supply-side and broad money supply conditions.

3.12 First-Stage of the 2SLS with Grouped Controls and Instruments

$$X_{1,it} = \gamma_0 + \gamma_1 Z_{1,it} + \theta' Z_{it} + \nu_{it} \quad (6)$$

Here:

$Z_{1,it}$= Broad money (instrument)

Z_{it}= = Vector of control variables (same as in the structural model)

θ'= Vector of coefficients for the controls

This formulation isolates the exogenous portion of domestic credit variation driven by financial system variables, while also controlling for macroeconomic factors.

3.13 Augmented Dickey-Fuller (ADF) Unit Root Test specification

For avoidance of doubt on stationarity and the estimation sample, all variables found to be I(1) by the ADF tests were transformed into first differences before estimation. Accordingly, the dependent variable is specified as Δrgdp_pc; the endogenous regressor is Δdc_ps; and the instrument, broad money supply, enters as Δb_m. Inflation, which is I(0), is entered in levels. Therefore, both the first-stage and second-stage 2SLS equations are estimated using Δ-forms for all I(1) series, ensuring coherence between the data transformations and the model specification.

Before estimating the 2SLS models, the time series properties of the variables were examined to avoid spurious regression results. Stationarity was tested using the Augmented Dickey–Fuller (ADF) test. The ADF test is based on the following regression equation:

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \sum_{i=1}^{p} \delta_i \Delta y_{t-i} + \epsilon_t \quad (7)$$

Where:

Δy_t= the first difference of the series, α = the intercept (drift term), βt = the time trend (optional, depending on test form), γy_{t-1} = the coefficient of interest for unit root, the null hypothesis means a unit root (non-stationary), are coefficients on lagged differences to handle serial correlation, $\sum_{i=1}^{p} \delta_i \Delta y_{t-i}$ = the number of lags, and ϵ_t = the error term.

The null hypothesis indicates that the variable has a unit root (non-stationary), while the alternative hypothesis: < 0 suggests stationarity. The optimal lag length (p) was selected based on the Akaike Information Criterion (AIC) to ensure white-noise residuals.

The results revealed that all variables, except inflation, were non-stationary at levels but became stationary after first differencing, indicating integration of order one, I (1). Inflation was stationary at level I (0). Consequently, the 2SLS estimations were carried out using the first differences of all non-stationary variables to ensure valid inference.

3.14 Fully Expanded First-Stage Model

$$X_{1,it} = \gamma_0 + \gamma_1 Z_{1,it} + \gamma_2 X_{2,it} + \gamma_3 X_{3,it} + \gamma_4 X_{4,it} + \gamma_5 X_{5,it} + \nu_{it} \quad (8)$$

This equation unpacks the control vector to show:

$X_{2,it}$: Gross capital formation

$X_{3,it}$: Government expenditure

$X_{4,it}$: Inflation

$X_{5,it}$: Trade openness

It now becomes clear that domestic credit is influenced by both instruments and macroeconomic conditions.

3.15 Basic Second-Stage Structural Model

$$Y_{it} = \lambda_0 + \lambda_1 \widehat{X_{1,it}} + \epsilon_{it} \quad (9)$$

Where:

Y_{it} = Economic performance (Proxied by rrgdp_pc)

$\widehat{X_{1,it}}$ = Fitted values of the endogenous variable (domestic credit) from the first-stage regression

ϵ_{it}= Error term

3.16 First-Stage Empirical Model (Actual Variables)

$$rgdp_pc_{it} = \gamma_0 + \gamma_1 b_m_{it} + \gamma_2 g_cf_{it} + \gamma_3 g_e_{it} + \gamma_4 in_f_{it} + \gamma_5 t_o_{it} + u_{it} \quad (10)$$

This equation (10) represents the first stage of the 2SLS estimation process, where dc_ps (domestic credit) is regressed on the instrument (b_m) and all control variables. The predicted values from this model will be used in the second stage to estimate the effect of domestic credit on Real GDP per capita.

3.17 Basic Second-Stage Structural Model

$$Y_{it} = \lambda_0 + \lambda_1 \widehat{X_{1,it}} + \epsilon_{it} \quad (11)$$

Where:

Y_{it} = Economic performance (Proxied by rgdp_pc)

$\widehat{X_{1,it}}$ = Fitted values of the endogenous variable (domestic credit) from the first-stage regression

ϵ_{it}= Error term

4. Results and Discussion

Table 3: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Real GDP per capita (rgdp_pc)	40	1000.97	790.422	253.747	2445.19
Domestic Credit to Private Sector (dc_ps)	40	10.8125	5.13777	2.20941	18.0717
Gross Capital Formation (g_cf)	40	18.7607	5.95238	6.87682	29.0021
Government Expenditure (g_e)	40	9.78144	2.34779	5.49934	15.3082
Inflation Rate (in_f)	40	21.5246	13.0948	4.8654	59.4616
Trade Openness (t_o)	40	68.2208	22.0457	18.8146	116.048
Broad Money Supply (b_m)	40	24.3321	6.29839	11.8133	34.1082

Source: Authors' Computations- Data obtained from the WDIs 1984-2023.

Notes: All values are based on data for Ghana, 1984–2023. Real GDP per capita is measured in constant U.S. dollars. Other variables are expressed as percentages of GDP or annual rates (as defined in the methodology).

The descriptive results indicate that Ghana's real GDP per capita averaged about USD 1,001 between 1984 and 2023, with wide variation across years (minimum USD 253; maximum USD 2,445). Domestic credit to the private sector remained relatively low, averaging 10.8% of GDP, suggesting underdeveloped financial intermediation. Gross capital formation averaged 18.7% of GDP, while trade openness averaged 68.2%, highlighting Ghana's increasing integration into international markets. Inflation was relatively high (mean 21.5%), consistent with Ghana's long history of macroeconomic instability. These patterns suggest that while trade and investment indicators improved over time, inflation and low private-sector credit remained potential constraints to economic performance.

Table 4: Pearson Correlation Matrix

Variable	rgdp_pc	dc_ps	g_cf	g_e	In_f	t_o	b_m
rgdp_pc	1						
dc_ps	0.617	1					
g_cf	0.047	0.475	1				
g_e	-0.620	-0.261	0.265	1			
In_f	-0.398	-0.497	-0.094	0.135	1		
t_o	0.059	0.668	0.665	0.210	-0.099	1	
b_m	0.421	0.785	0.465	-0.056	-0.287	0.802	1

Source: Authors' Computations- Data obtained from the WDIs 1984-2023

Correlation results reveal that domestic credit to the private sector is positively and strongly correlated with real GDP per capita (r = 0.617), supporting the finance–growth nexus emphasised in Neo-Classical and Endogenous Growth theories. Gross capital formation, however, showed little correlation with growth, while government expenditure was negatively correlated with GDP per capita, suggesting possible inefficiencies in fiscal spending. Inflation exhibited a negative correlation with growth (r = -0.398), consistent with the inflation-threshold literature, which posits that high inflation is detrimental to growth (Bruno & Easterly, 1998).

Table 5: First-Stage Estimates and Robust Tests of Instrument Relevance

ddc_pc	Obsv	Robust Coeff	Std. Err	t	P>|t|
db_m	39	0.39934	0.10911	3.66	0.0008
dg_cf	39	0.30093	0.07689	4.14	0.0000
dg_e	39	0.11079	0.02300	4.82	0.0000
in_f	39	-0.07149	0.02329	-3.07	0.0021
dt_o	39	0.05972	0.02637	2.26	0.0238
_cons	39	0.20461	0.06865	2.98	0.0028

Source: Authors' Computations- Data obtained from the WDIs 1984-2023.

F test of excluded instruments:

F (1, 33) = 13.4

Prob > F = 0.0008

Sanderson-Windmeijer multivariate F test of excluded instruments:

F (1, 33) = 13.4

Prob > F = 0.0008

The first-stage regression results indicate that the instrument, broad money supply (in first differences), is strongly correlated with the endogenous regressor, domestic credit to the private sector (in first differences), with a coefficient of 0.399 and a robust F-statistic of 13.40 (p = 0.0008). This exceeds the conventional threshold of 10 suggested by Staiger and Stock (1997), thus mitigating concerns over weak instrument bias. Since the model is exactly identified, statistical tests of overidentifying restrictions cannot be performed. Consequently, the validity of the instrument rests on theoretical grounds: broad money supply primarily influences economic performance through its effect on domestic credit availability, while other macroeconomic channels are controlled for through variables such as government expenditure, inflation, trade openness, and gross capital formation.

Table 6: Endogeneity test of endogenous regressor (Durbin–Wu–Hausman)

$Chi^2(1)$ Endogeneity test statistic	p-value
5.804	0.0160

Source: Authors' Computations- Data obtained from the WDIs 1984-2023.

H_0= The regressor (ddc_ps) is exogenous (not endogenous).

H_1= The regressor (ddc_ps) is endogenous.

Since the p-value is 0.0160, which is less than the conventional significance level of 0.05, we reject the null hypothesis of exogeneity. This indicates that the variable ddc_ps is indeed endogenous in your model and must be instrumented, confirming that the use of IV/2SLS is justified. The endogeneity test yielded a Chi-square statistic of 5.804 ($p = 0.016$), rejecting the null hypothesis of exogeneity for domestic credit to the private sector (Durbin, 1954; Wu, 1973; Hausman, 1978). This reinforces the bidirectional causality between credit and growth discussed in the empirical review (see Ofori-Abebrese et al., 2017; Yerima & Idris, 2023).

Table 7: ADF Unit Root Test Critical Values and Test Statistics

Variable	Order of Integration	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value	Z |t| p-values
δrgdp_pc	I(1)	-4.835	-3.668	-2.966	-2.616	0.0000
δdc_ps	I(1)	-4.046	-3.668	-2.966	-2.616	0.0012
δg_cf	I(1)	-5.078	-3.668	-2.966	-2.616	0.0000
δg_e	I(1)	-5.822	-3.668	-2.966	-2.616	0.0000
δin_f	I(0)	-3.451	-3.662	-2.964	-2.614	0.0093
δt_o	I(1)	-6.077	-3.668	-2.966	-2.616	0.0000
δb_m	I(1)	-5.170	-3.668	-2.966	-2.616	0.0000

Source: Authors' Computations- Data obtained from the WDIs 1984-2023.

Augmented Dickey-Fuller unit root tests (Table 7) show most variables are integrated of order one, I(1), except inflation, which is stationary at level, I(0). These results support the use of differencing in the model to avoid spurious regressions, consistent with best practices in time-series econometrics (Gujarati & Porter, 2009).

Table 8: Main Second Stage Least Squares (2SLS) Regression

Variable	Obsvs	Coeff.	Robust Std Err.	z	P>|z|
δd_pc	39	-171.409	69.479	-2.46	0.014
δg_cf	39	0.859	0.764	1.124	0.260
δg_e	39	27.645	11.108	2.489	0.013
in_f	39	-6.123	2.555	2.396	0.017
δt_o	39	3.389	1.588	2.134	0.033
_cons	39	210.631	105.763	1.992	0.047

Source: Authors' Computations- Data obtained from the WDIs 1984-2023.

F (5, 33) = 2.75

P>F = 0.0335

The 2SLS estimates reveal a negative and statistically significant effect of domestic credit on real GDP per capita (β = -171.4; p < 0.05). This result diverges from the Neo-Classical prediction that more credit should raise growth, but it aligns with findings by Ozili et al. (2022) suggesting a negative relationship that credit in developing Ecowas countries often fuels consumption or unproductive sectors rather than productive investment, and also reflects inefficiencies or misallocation within the credit market. Gross capital formation, although not statistically significant, the positive sign aligns with extensive literature showing investment in physical capital as critical for growth (Aslan & Altinoz, 2021; Chindengwike, 2025).

Government expenditure showed a positive and significant effect on growth (β = 27.6; p < 0.05), supporting Keynesian arguments that public spending stimulates economic activities (Odhiambo & Nyasha, 2018). Inflation exerted a negative and significant effect (β = -6.12; p < 0.05), consistent with inflation-threshold theories and confirms the destabilising effect of inflation on economic output, consistent with prior studies (Agarwal & Baron, 2024). Trade openness contributed positively to growth (β = 3.39; p < 0.05), reinforcing arguments from Oppong-Baah et al. (2022) that openness enhances productivity through market access and competition and re-echoes the benefits of global economic integration for Ghana's growth.

Table 9: Instrument Validity and Autocorrelation Diagnostic Tests

Test	Statistic	df	p-value	Decision (5% level)
Breusch–Godfrey LM (1)	0.4591	1	0.4980	Fail to reject H_0: No 1st-order autocorrelation
Breusch–Godfrey LM (2)	3.2422	2	0.1977	Fail to reject H_0: No 2nd-order autocorrelation
F-test of Excluded Instrument	13.40	(1,33)	0.0008	Reject H_0: Instrument is relevant
Sanderson–Windmeijer multivariate F	13.40	(1,33)	0.0008	Reject H_0: Instrument is relevant
Durbin–Wu–Hausman	5.804	1	0.0160	Reject H_0: Regressor is exogenous
Hansen J test	0.000	—	—	Not applicable: Model exactly identified

Source: Authors' computations using World Development Indicators (WDI), 1984–2023.

The diagnostic results in Table 9 provide strong support for the robustness of the 2SLS estimation. The Breusch–Godfrey LM tests for autocorrelation (Breusch & Godfrey, 1978) show that both first-order (*p = 0.4980*) and second-order (*p = 0.1977*) serial correlation are absent in the model residuals, suggesting that the error terms are well-behaved and that the estimates are not biased by serial correlation. Instrument relevance is confirmed by the highly significant F-test of excluded instruments (F = 13.40, *p = 0.0008*) and the Sanderson–Windmeijer multivariate F-test (Sanderson & Windmeijer, 2016), both exceeding the conventional threshold of 10 suggested by Staiger and Stock (1997) to avoid weak instrument bias. The Hansen J test (Hansen, 1982) is not applicable because the model is exactly identified, implying that no overidentification restrictions are available to test instrument exogeneity. The Durbin–Wu–Hausman test (Durbin, 1954; Wu, 1973; Hausman, 1978) yields a statistic of 5.804 (*p = 0.0160*), confirming that the key regressor, ddc_ps, is endogenous and justifying the use of instrumental variable estimation. Collectively, these results validate the appropriateness of the chosen instrument and the reliability of the 2SLS estimates.

4.1 Theoretical and Empirical Linkages

This study's findings reveal that domestic credit exerts a negative and significant effect on economic performance in Ghana, which diverges from the Neo-Classical Growth Theory that associates credit-financed capital accumulation with higher output (Solow, 1956; Swan, 1956). Instead, this outcome aligns more closely with the Endogenous Growth Theory, which cautions that the efficiency and allocation of credit are more critical than its volume (Romer, 1990; Lucas, 1990). The evidence suggests that financial intermediation in Ghana may be constrained by structural inefficiencies and a misallocation of resources toward consumption rather than productive investment, consistent with studies in ECOWAS and other Sub-Saharan African contexts (Ozili et al., 2022; Amali et al., 2023). In contrast, government expenditure and trade openness were found to positively and significantly influence growth, confirming Keynesian perspectives on fiscal stimulus (Odhiambo & Nyasha, 2018) and empirical findings that openness facilitates productivity gains through market access and technology transfer (Oppong-Baah et al., 2022).

Furthermore, the results underscore the destabilising role of inflation, which significantly undermines growth, consistent with inflation-threshold literature that identifies adverse effects when price levels exceed moderate bounds (Bruno & Easterly, 1998; Agarwal & Baron, 2024). Gross capital formation, though positive, proved statistically insignificant, which reflects earlier evidence that investment volumes alone are insufficient to spur growth unless accompanied by efficiency and supportive fiscal frameworks (Aslan & Altinoz, 2021; Chindengwike, 2025). Taken together, the results highlight the conditional nature of finance-led growth in Ghana: credit expansion must be complemented by effective allocation, fiscal discipline, monetary stability, and openness-driven competitiveness for its full growth potential to materialise. This synthesis bridges the theoretical expectations with empirical outcomes, reinforcing that both institutional quality and macroeconomic management shape the finance–growth nexus.

5. Conclusion

Limitations include exact identification precluding overidentification tests and the potential endogeneity of some controls not instrumented here. Future research should incorporate additional policy or banking-structure instruments, test alternative identification strategies (e.g., system-GMM), and examine sectoral allocation of credit to distinguish productive from consumption credit. Exploring nonlinearities and threshold effects would further reconcile divergent findings in the Ghanaian literature.

This study set out to assess the impact domestic credit has on economic performance in Ghana, controlled for gross capital formation, government expenditure, inflation, and trade openness with broad money supply as an instrument. Overall, the results validate the expected positive roles of trade openness and government expenditure in promoting

economic performance in Ghana, while highlighting the critical need to control inflation. The findings on domestic credit suggest that, while vital, credit growth must be accompanied by reforms to improve efficiency and address structural constraints in the financial sector. This outcome is consistent with broader empirical research and guides policymakers to focus not only on credit expansion but also on enhancing financial market functioning and macroeconomic stability.

6. Policy Implications and Recommendations

The empirical findings carry important implications for financial and macroeconomic policy in Ghana. The negative effect of domestic credit on economic performance suggests that while credit volumes have expanded, allocation efficiency remains a challenge. This points to the need for reforms that strengthen credit quality, risk assessment, and monitoring mechanisms to ensure that loans are directed toward productive, growth-enhancing sectors such as manufacturing, agriculture, and technology, rather than toward consumption or speculative activities. Enhancing institutional capacity within the banking sector and enforcing prudent lending standards will improve the growth elasticity of credit.

The positive role of government expenditure highlights the importance of public investment in infrastructure, education, and health, which can stimulate aggregate demand and crowd-in private sector activity. Policymakers should prioritise capital expenditures that generate long-term productivity gains rather than recurrent expenditures that provide limited returns. At the same time, fiscal discipline must be maintained to prevent unsustainable deficits that could undermine macroeconomic stability.

The strong adverse effect of inflation reinforces the argument for credible and consistent monetary policy. The Bank of Ghana should strengthen inflation-targeting frameworks, aiming to keep price growth within the recommended corridor of 8% ± 2% to safeguard investment confidence and protect real incomes. This requires maintaining a balance between liquidity provision and price stability.

The positive contribution of trade openness suggests that Ghana should continue pursuing export diversification and global market integration, but with complementary policies that enhance competitiveness, such as investments in logistics, industrial upgrading, and trade facilitation infrastructure. These measures would maximise the gains from openness while minimising vulnerability to external shocks.

Finally, the insignificance of gross capital formation signals that the quality and efficiency of investment may matter more than its sheer volume. Strengthening project appraisal, monitoring, and governance frameworks will help ensure that both domestic and foreign investments translate into tangible economic performance.

REFERENCES

Adu-Gyamfi, G., Nketiah, E., Obuobi, B., & Adjei, M. (2020). Trade openness, inflation and GDP growth: Panel data evidence from nine West African countries. *Open Journal of Business and Management, 8*(1),

314–328. https://doi.org/10.4236/ojbm.2020.81019

Agarwal, I., & Baron, M. (2023, June 15). Exploring the link between rising inflation and economic performance: The role of the banking sector. *World Bank Blogs*. https://blogs.worldbank.org/en/allaboutfinance/exploringlink-between-rising-inflation-and-economic-growth-role-banking-sector

Agarwal, I., & Baron, M. (2024). Inflation and disintermediation. *Journal of Financial Economics*. Advance online publication. https://doi.org/10.2139/ssrn.3399553

Ahamed, F. (2021). *Impact of public and private investments on economic performance of developing countries*. arXiv. https://doi.org/10.48550/arXiv.2105.14199

Alaba, J. S., Ahmed, Y., Mopelola, M.-A. K., & Hussain, U. (2024). Stock market liquidity and stock market performance in Nigeria: Evidence from the Nigerian Exchange Limited. *IRASD Journal of Management, 6*(2), 78–89. https://doi.org/10.52131/jom.2024.0602.0124

Al Mamun, A. (2018). Financial development and economic performance in South Asia: Does institutional quality matter? *International Journal of Financial Studies, 6*(1), 12. https://doi.org/10.3390/ijfs6010012

Appiah-Otoo, I., & Song, N. (2022). Finance-growth nexus: New insight from Ghana. *International Journal of Finance & Economics, 27*(3), 2682-2723. doi: https://doi.org/10.1002/ijfe.2294

Aslan, A., & Altinoz, B. (2021). The impact of natural resources and gross capital formation on economic performance in the context of globalization: Evidence from developing countries on the continent of Europe, Asia, Africa, and America. *Environmental Science and Pollution Research, 28*(26), 33794–33805.https://doi.org/10.1007/s11356-021-12979-7

Attafuah, E. D., Amoako, S., & Amponsah, F. (2025). Impact of inflation on economic performance on the Ghanaian economy in entrepreneurial perspective. *International Journal of Research and Innovation in Social Science, 9*(4), 975–985. **https://doi.org/10.47772/IJRISS.2025.90400075**

Arawatari, R., Hori, T., & Mino, K. (2023). Government expenditure and economic performance: A heterogeneous agents approach. *Journal of Macroeconomics, 75,* 103486. https://doi.org/10.1016/j.jmacro.2022.103486

Aydin, C., & Esen, O. (2019). Optimal tax revenues and economic performance in transition economies: A threshold regression approach. *Global Business and Economics Review, 21*(2), 246–265. https://doi.org/10.1504/GBER.2019.098533

Barlas, A. W. (2020). The impact of government expenditure on economic performance in Afghanistan. *Journal of Economics and Business, 3*(2). Available at SSRN. http://dx.doi.org/10.2139/ssrn.3603324

Barro, R. J. (1991). Economic performance in a cross section of countries. *Quarterly Journal of Economics, 106*(2), 407–443. https://doi.org/10.2307/2937943

Bollen, K. A. (1996). An alternative two stage least squares (2SLS) estimator for latent variable equations. *Psychometrika, 61*(1), 109–121. https://doi.org/10.1007/BF02296961

Breusch, T. S., & Godfrey, L. G. (1978). Testing for autocorrelation in dynamic linear models. *Australian Economic Papers, 17*(31), 334–355. https://doi.org/10.1111/j.1467-8454.1978.tb00635.x

Bruno, M., & Easterly, W. (1998). Inflation crises and long-run growth. *Journal of Monetary Economics, 41*(1), 3–26. https://doi.org/10.1016/S0304-3932(97)00063-9

China Economic Information Center.(CEIC). (2024, November). *Ghana domestic credit growth*. CEIC. https://www.ceicdata.com/en/indicator/ghana/domestic-credit-growth

Chindengwike, J. D. (2025). Effect of gross capital formation on the economic performance in Tanzania: A vector error correction model analysis. *African Journal of Empirical Research, 6*(1), 67–77. https://doi.org/10.51867/ajernet.6.1.7

Durbin, J. (1954). Errors in variables. *Review of the International Statistical Institute, 22*(1/3), 23–32. https://doi.org/10.2307/1401916

Gbenga, O., & Chibuzor, E. C. (2023). Industrial activities and environmental degradation in Nigeria. *International Journal of Business Diplomacy and Economy, 2*(8), 77–90. https://doi.org/10.51699/ijbde.v2i8.2411

Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics* (5th ed.). McGraw-Hill.

Gyamfi, N. M., Bokpin, G. A., Aboagye, A. Q. Q., & Ackah, C. G. (2022). Financial development, institutional quality and inclusive growth in Africa. *Global Business Review, 23*(3), 584–607. https://doi.org/10.1177/0972150919857027

Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica, 46*(6), 1251–1271. https://doi.org/10.2307/1913827

International Monetary Fund. (2023, May 17). *IMF executive board approves US$3 Billion extended credit facility arrangement for Ghana.* Press release No. 23/151. Retrieved from https://www.imf.org/en/News/Articles/2023/05/17/pr23151-ghana-imf-executive-board-approvesextended-credit-facility-arrangement-for-ghana

Katushabe. A. (2024). The role of government spending in stabilizing the economy. *Journal of Economics and Economic Education Research, 25*(3), 1-3

King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics, 108*(3), 717–737. https://doi.org/10.2307/2118406

Lucas, R. E., Jr. (1990). Why doesn't capital flow from rich to poor countries? *American Economic Review, 80*(2), 92–96.

McKinnon, R. I. (1973). *Money and capital in economic development*. Brookings Institution.

Mensah, N., & Adukpo, T. K. (2025). Impact of government expenditure on economic performance of Ghana. *Asian Journal of Economics, Business and Accounting, 25*(3), 232–247. https://doi.org/10.9734/ajeba/2025/v25i31706

Mogstad, M., Torgovitsky, A., & Walters, C. R. (2021). The causal interpretation of two-stage least squares with multiple instrumental variables. *American Economic Review, 111*(11), 3663–3698. https://doi.org/10.1257/aer.20190221

Nam, C., & Ryu, E. (2024). The impact of trade openness on economic performance: Evidence from developing economies. *Journal of International Economics, 130*.

Nor, B. A., & Yusof, Y. (2025). Government spending and economic performance dynamics in Somalia: Time series evidence from ARDL bounds testing. *Discover Sustainability, 6,* 875. https://doi.org/10.1007/s43621025-01471-8

Ntamwiza, F., & Masengesho, B. (2022). Financial intermediation and economic performance in East Africa. *African Development Review, 34*(1), 78–94.

Nyarko-Asomani, A., Bhasin, V. K., & Aglobitse, P. B. (2019). Government capital expenditure, recurrent expenditure and economic performance in Ghana. *Ghanaian Journal of Economics*, 7(1), 44–70. https://hdl.handle.net/10520/EJC-1b2f6ea97f(open in a new window)

Nyasha, S., & M. Odhiambo, N. (2018). Finance-growth nexus revisited: Empirical evidence from six countries. *Scientific Annals of Economics and Business*, *65*(3), 247–268. https://doi.org/10.2478/saeb2018-0021

Ofori-Abebrese, G., Pickson, R. B., & Diabah, B. T. (2017). Financial development and economic performance: Additional evidence from Ghana. *Modern Economy, 8*(2), 282–297. https://doi.org/10.4236/me.2017.82020

Olowofeso, O. E., John-Sowe, M., Kargbo, S. M., Adeleke, A. I., Yengbe, J. R., & Cham, Y. (2022). *Threshold effect of inflation on economic performance in the West African Monetary Zone* (WAMI Occasional Paper Series No. 26). West African Monetary Institute.

Oppong-Baah, T., Bo, Y., Twi-Brempong, C., Amoah, E., Prempeh, N., & Addai, M. (2022). The impact of trade openness on economic performance: The case of Ghana and Nigeria. *Journal of Human Resource and Sustainability Studies, 10*(1), 142–160. https://doi.org/10.4236/jhrss.2022.101010

Ozili, P. K., Oladipo, O., & Iorember, P. T. (2022). *Effect of abnormal credit expansion and contraction on GDP per capita in ECOWAS countries* (MPRA Paper No. 114406). Munich Personal RePEc Archive. https://mpra.ub.uni-muenchen.de/114406/

Poku, K., Opoku, E., & Agyeiwaa Ennin, P. (2022). The influence of government expenditure on economic growth in Ghana: An Ardl approach. *Cogent Economics & Finance*, *10*(1). https://doi.org/10.1080/23322039.2022.2160036

Raghutla, C. (2020). The effect of trade openness on economic performance: Some empirical evidence from emerging market economies. *Journal of Public Affairs, 20*(3), e2081.

Rahman, S., Ahmed, R., & Dewan, M. (2023). Macroeconomic determinants of economic performance in emerging markets. *Emerging Markets Finance and Trade, 59*(5), 1401–1416. https://doi.org/10.1080/1540496X.2022.2098765

Romer, P. M. (1990). Endogenous technological change. *Journal of Political Economy, 98*(5, Part 2), S71 S102. https://doi.org/10.1086/261725

Sargan, J. D. (1958). On the estimation of economic relationships by means of instrumental variables. *Journal of the Royal Statistical Society: Series B (Methodological), 21*(1), 91–105.

Sarpong, B., & Nketiah-Amponsah, E. (2022). Financial inclusion and inclusive growth in Sub-Saharan Africa. *Cogent Economics & Finance, 10*(1). https://doi.org/10.1080/23322039.2022.2058734

Schumpeter, J. A. (1911). *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle*. Harvard University Press.

Semwenda, A. S. (2023). *Testing the finance-growth nexus for Sub-Saharan Africa: A meta-analysis of the evidence* (Doctoral dissertation, University College London). University College London. https://discovery.ucl.ac.uk/id/eprint/10180200/

Shaw, E. S. (1973). *Financial deepening in economic development*. Oxford University Press.

Solow, R. M. (1956). A contribution to the theory of economic performance. *Quarterly Journal of Economics, 70(*1), 65-94.

Staiger, D., & Stock, J. H. (1997). Instrumental variables regression with weak instruments. *Econometrica, 65*(3), 557–586. https://doi.org/10.2307/2171753

Su, S. K. W., & Soon, S.-V. (2024). The impact of inflation on economic performance. *Issues and Perspectives in Business and Social Sciences, 4*(2), 187–201. https://doi.org/10.33093/ipbss.2024.4.2.6

Swan, T. W. (1956). Economic performance and capital accumulation. *Economic Record, 32*(2), 334–361. https://doi.org/10.1111/j.1475-4932.1956.tb00434.x

Theil, H. (1953). *Estimation and simultaneous correlation in complete equation systems* [Mimeograph]. Central Planning Bureau, The Hague.

Wiredu, J., Nketiah, E., & Adjei, M. (2020). The relationship between trade openness, foreign direct investment and economic performance in West Africa: Static panel data model. *Journal of Human Resource and Sustainability Studies, 8*(1), 18–34. https://doi.org/10.4236/jhrss.2020.81002

World Bank. (2025, August 14). *Ghana's economy shows resilience amid a challenging environment*. Retrieved from https://www.worldbank.org/en/news/press-release/2025/08/14/ghana-economy-shows-resilienceamid-a-challenging-environment

Wu, D.-M. (1973). Alternative tests of independence between stochastic regressors and disturbances. *Econometrica, 41*(4), 733–750. https://doi.org/10.2307/1910090

Xiong, M. (2023). Relationship between GDP and inflation rate. *BCP Business & Management, 40,* 372–376. https://doi.org/10.54691/bcpbm.v40i.4403

Yerima, O. W., & Idris, M. (2023). Effect of banking credits on economic performance: Evidence from Nigeria. *International Journal of Economics and Development Policy, 6*(1), 117–134.

Yossinomita, H., Haryadi, H., Nainggolan, S., & Zulfanetti, Z. (2024). Maximizing economic performance in Indonesia: A model-based exploration of optimal tax ratios. *Indonesian Treasury Review: Jurnal Perbendaharaan, Keuangan Negara dan Kebijakan Publik, 9*(2), 87–98. https://doi.org/10.33105/itrev.v9i2.1026