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(AIJBAF)**www.gaexcellence.com/aijbaf**PRIVATE SECTOR BANK CREDIT, FINANCIAL
DEEPENING AND ECONOMIC GROWTH IN UGANDA:
AUTOREGRESSIVE DISTRIBUTED LAG**David Namanya^{1*}, Geoffrey Nuwagaba², Tusubira Festo Nyende³, Eric Nzibonera⁴¹Department of Accounting and Finance, College of Business and Management Sciences, Makerere University, Kampala, Uganda namanyandb@gmail.com <https://orcid.org/0000-0003-2004-0424>²Department of Accounting and Finance, College of Business and Management Sciences, Makerere University, Kampala, Uganda geofreynuwagaba@yahoo.co.uk <https://orcid.org/0000-0002-7044-2715>³Department of Accounting and Finance, College of Business and Management Sciences, Makerere University, Kampala, Uganda festtn@gmail.com <https://orcid.org/0000-0001-8553-9061>⁴Department of Accounting and Finance, College of Business and Management Sciences, Makerere University, Kampala, Uganda ernzibonera@gmail.com <https://orcid.org/0009-0005-5509-3210>

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Abstract:

This study evaluated the short run relationships among private sector bank credit, monetary depth, inflation and real output in Uganda from 1994 to 2025 and tested whether the variables shared a stable long run relationship. Annual data from the World Development Indicators were analysed using descriptive statistics, Augmented Dickey–Fuller (ADF) unit root tests and autoregressive distributed lag (ARDL) bounds testing. The Akaike information criterion selected an ARDL model with lag order (2,2,2,2). The bounds test F statistic of 1.684 was below the 5 per cent lower and upper critical values of 4.01 and 5.07, so no stable long run cointegrating relationship was established. In the short run, private sector credit was positively associated with real output in the current year ($\beta = 0.0180$, $p = 0.005$) and after one year ($\beta = 0.0140$, $p = 0.044$). In these results, β denotes the estimated regression coefficient and p denotes the probability value used to assess statistical significance. Broad money had negative conditional associations in the current year ($\beta = -0.0090$, $p = 0.024$) and after one year ($\beta = -0.0075$, $p = 0.035$). Current inflation was insignificant ($\beta = -0.0010$, $p = 0.458$), while lagged inflation was negative and significant ($\beta = -0.0019$, $p =$

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0.045). The findings indicate that the relationship between finance and output depends not only on monetary depth but also on the extent to which banks channel funds to private borrowers. Uganda should thus strengthen credit information, collateral systems and access to affordable long-term finance, while directing greater attention to productive sector lending.

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Keyword:

Bank Credit; Economic Growth; Financial Deepening; Monetary Transmission



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Introduction

According to Mishkin and Eakins, (2018), Private sector credit refers to funds that banks and other financial institutions provide to businesses and households through loans, securities, trade credit and other repayable claims. It contributes to financial deepening by widening access to financial services and resources, which is often assessed using indicators such as broad money (World Bank, 2026; Durusu Ciftci et al., 2017; Nguyen et al., 2022). An effective financial system supports economic activity by mobilising savings and allocating them to investments with viable expected returns. Banks are central to this process because they transform short term deposits into working capital and longer-term finance for households and businesses (Levine, 2005; Mishkin & Eakins, 2018).

Evidence from sub-Saharan Africa given mixed results, with some studies reporting positive, negative or nonlinear relationships between financial deepening and economic growth. Some studies have found a positive relationship, while others show a weak, negative or nonlinear effects, with the results varying according to the financial indicator used, the sectoral allocation of credit, institutional quality and macroeconomic stability (Bist, 2018; Ibrahim & Alagidede, 2018; Machado et al., 2021; Odhiambo, 2023). Research from other African economies doesn't have differing results except that the relationship differs across levels of financial development, country income groups and institutional settings (Aluko & Ibrahim, 2020; An et al., 2021; Asante et al., 2023; Fengju & Wubishet, 2024; Girma & Huseynov, 2025). The research evidence from periods of economic and financial crisis also shows that both the direction and strength of the relationship depend on macroeconomic conditions and sample characteristics (Asteriou & Spanos, 2019).

For this study, Uganda offers a useful setting in which to examine this relationship given the 1990s financial sector restructuring, prudential reform and rapid technological change, even

though the formal bank credit to the private sector remaining shallow. These reforms have resulted into greater banking stability, wider use of digital payments and stronger deposit mobilisation in Uganda but have not reduced high lending costs, short loan maturities, demanding collateral requirements or banks' preference for relatively low risk government securities. Uganda has thus combined sustained growth in real output with modest private sector credit depth, raising the question of which aspect of financial development is most closely associated with its economic performance.

This study examined the relationships among domestic credit to the private sector by banks, broad money, inflation and real output in Uganda from 1994 to 2025, with particular attention to whether those relationships were temporary or persistent. We estimated the current and lagged associations of private sector bank credit, broad money and inflation with real output and tested for a stable long run cointegrating relationship. Private credit and broad money were examined separately because they capture different features of the financial system. Private credit shows how far deposit taking institutions channel funds to private borrowers, whereas broad money measures liquid liabilities and the monetisation of the economy. Deposits may be held as reserves, invested in government securities or used in ways that do not immediately increase productive capacity, combining the two measures can thus conceal the channel through which finance is related to output (Benczúr et al., 2019; Machado et al., 2021). This distinction is also supported by evidence that private credit, intermediation efficiency and broad money have different relationships with investment (Iheonu et al., 2020).

The analysis extends Uganda specific evidence from 1994 through 2025 and covers banking reforms, the global financial crisis, the growth of mobile money, the impact coronavirus disease 2019 (COVID 19) lockdowns and the ensured economic recovery thereafter. Unlike studies that used private credit and broad money interchangeably to estimate the short run associations with real output separately we adopted the ARDL model to accommodate variables integrated order zero, $I(0)$, and order one, $I(1)$, which provides a formal test of co-integration, thus our analysis used aggregate macroeconomic data to interpret the coefficients as associations rather than causal effects (Pesaran et al., 2001).

Literature Review and Hypotheses

Private Sector Bank Credit and Real Economic Activity

According to the supply leading view, finance supports growth by reducing lending costs and funding new ideas (Beck et al., 2000). Levine, (2005) posit that banks contribute private sector bank credit by screening projects, pooling risk and providing finance before businesses have accumulated enough retained earnings to fund expansion. Some empirical work link private credit to productivity growth and capital accumulation, while other research show that the composition of lending and the quality of institutions matter the most (Beck et al., 2000; King & Levine, 1993; Levine, 2005). Credit can affect current output by financing inventories, payroll, trade and seasonal production, whereas business formation and capital expenditure may influence output with size of either effect depending on loan maturity, lending rates, collateral requirements and the sectors that receive credit (Arcand et al., 2015; Ustarz et al., 2021). Lending for consumption, property speculation or refinancing is less likely to raise productive capacity than credit directed to viable agriculture, manufacturing, logistics and export services (Ustarz et al., 2021). African evidence further indicates that institutional quality

and the development of the real sector shape the finance and growth relationship (Aluko & Ibrahim, 2020; Taiwo, 2021). A positive short run association is nevertheless plausible in Uganda because many businesses face requisite financing constraints which limit their access to bank credit.

Monetary Depth and the Limits of Quantity Based Finance

Broad money is widely used as a measure of financial deepening because it captures currency in circulation and the deposit liabilities of financial institutions relative to the size of the economy (Nguyen et al., 2022). According to Durusu Ciftci et al., (2017), an increase in broad money can improve payment efficiency, widen the choice of savings instruments and enlarge the funding base of financial intermediaries. Broad money often grows where deposits have increased, foreign capital is entering the economy, monetary policy has become more accommodative or government financing has expanded even if private sector credit changes little (Durusu Ciftci et al., 2017; Nguyen et al., 2022). Financial expansion may hence have a weak or negative relationship with growth when funds are poorly allocated, leverage becomes excessive or the financial sector draws labour and capital away from productive activities (Nguyen et al., 2022). Uganda like many developing countries in Africa has a thin financial system by international standards, but the distinction remains important, the size of the system does not necessarily reveal how effectively it supports production (Arcand et al., 2015; Machado et al., 2021).

Inflation in the Finance and Growth Relationship

According to Ibrahim & Alagidede, (2018) Inflation affects the real return on deposits, borrowing costs, collateral values and the predictability of long-term financial contracts. While moderate and predictable inflation can coexist with economic growth, hyperinflation or volatile inflation raises uncertainty and risk premiums, shortens lending horizons and reduces the real value of financial assets. Inflation also leads to monetary tightening, whose effects on credit demand, investment and output emerge gradually (Ibrahim & Alagidede, 2018). Evidence from African economies have identified price stability as an important condition in the relationship between financial development and growth (Bandura & Leshoro, 2022; Ibrahim & Alagidede, 2018). Economic theory does not imply that inflation has the same effect on growth at every rate or in every period, but persistent or unexpected inflation is generally expected to weaken growth, while the current coefficient may be insignificant or even positive when prices rise alongside strong aggregate demand (Bandura & Leshoro, 2022). A lagged term may thus capture the response more clearly because households, businesses and financial institutions adjust their borrowing, lending and investment decisions over time hence both current and lagged inflation were included in our model to allow for this delayed response. Against the above arguments, we developed the following hypotheses:

H₁: Changes in domestic credit to the private sector by banks are positively associated with changes in real economic output in Uganda.

H₂: Changes in broad money have a statistically significant short run association with changes in real economic output when private sector credit is held constant.

H₃: Inflation has an adverse short run association with real economic output, particularly with a lag.

H₄: Real output, private sector bank credit, broad money and inflation form a stable long run relationship in Uganda.

Methodology

This study used annual Ugandan data from 1994 to 2025 with real gross domestic product at constant 2015 prices expressed as a natural logarithm, domestic credit to the private sector by banks and broad money measured as percentages of gross domestic product, and inflation was measured by the annual percentage change in the consumer price index (CPI). The series were obtained from the World Development Indicators, whose financial measures draw on concepts used in the International Monetary Fund's International Financial Statistics. Furthermore, the definitions and reported trends were checked against publications of the Bank of Uganda and the International Monetary Fund. The principal sources were thus the World Bank (2026), Bank of Uganda (2026), and International Monetary Fund (2026).

The starting year of 1994 provided a continuous series for the period following Uganda's financial sector reforms, while the 2025 end date captured the latest information available. Aggregate macroeconomic indicators improve consistency and comparability across years, but they do not separate borrowers by size or sector and do not show differences in loan maturity, interest cost, or asset quality.

Table 1: Variable Definitions and Expected Relationships

Variable	Measurement	Role	Expected sign
Real output	Natural log of real GDP, constant 2015 United States (US) dollars	Dependent	
Private sector bank credit	Domestic credit to private sector by banks (% GDP)	Independent	Positive
Broad money	Broad money (% GDP)	Independent	Positive or ambiguous
Inflation	Annual CPI inflation (%)	Conditioning variable	Negative

Source: Own Source

Econometric Strategy

The autoregressive distributed lag (ARDL) approach was suitable because the variables were a mixture of variables integrated of order zero, $I(0)$, and order one, $I(1)$, and none was integrated of order two, $I(2)$. We estimated short run dynamics and tests for a long run level relationship without requiring all variables to have the same order of integration (Pesaran et al., 2001). This flexibility was useful given our 32 annual observations, although the inclusion of several variables and lags still reduced the available degrees of freedom. Augmented Dickey Fuller tests were conducted first, and the Akaike information criterion then selected an ARDL (2,2,2,2) model with a deterministic trend to account for the sustained increase in real output (Brooks, 2019; Pesaran et al., 2001). The four lag orders refer respectively to real output, private credit, broad money and inflation. The estimated level specification was $\ln \text{RGDP}_t = \alpha_0 + \alpha_1 t + \sum_i \phi_i \ln \text{RGDP}_{t-i} + \sum_j \beta_j \text{PSC}_{t-j} + \sum_k \gamma_k \text{BM}_{t-k} + \sum_l \delta_l \text{INF}_{t-l} + \varepsilon_t$, where;

- $\ln \text{RGDP}_t$ denotes the natural logarithm of real GDP in year t ;
- α_0 is the intercept
- α_1 is the coefficient on the time trend t
- PSC_t , BM_t and INF_t denote private sector bank credit, broad money and inflation, respectively
- ϕ_i , β_j , γ_k and δ_l are lag coefficients
- i , j , k and l identify the lag orders
- Σ is the summation operator; and
- ε_t is the error term.

The equation was then reparameterised as an unrestricted error correction representation, differenced terms measured short run movements, and the lagged level terms were tested jointly for cointegration. A bounds statistic below the lower critical value meant that the null hypothesis of no long run relationship could not be rejected. Post estimation tests assessed residual normality, serial correlation, heteroscedasticity and dynamic stability. Because the ARDL(2,2,2,2) specification contains four variables and several lags in a small annual sample, p values were considered alongside coefficient size, sign, economic plausibility and the limitations of aggregate data (Wooldridge, 2020).

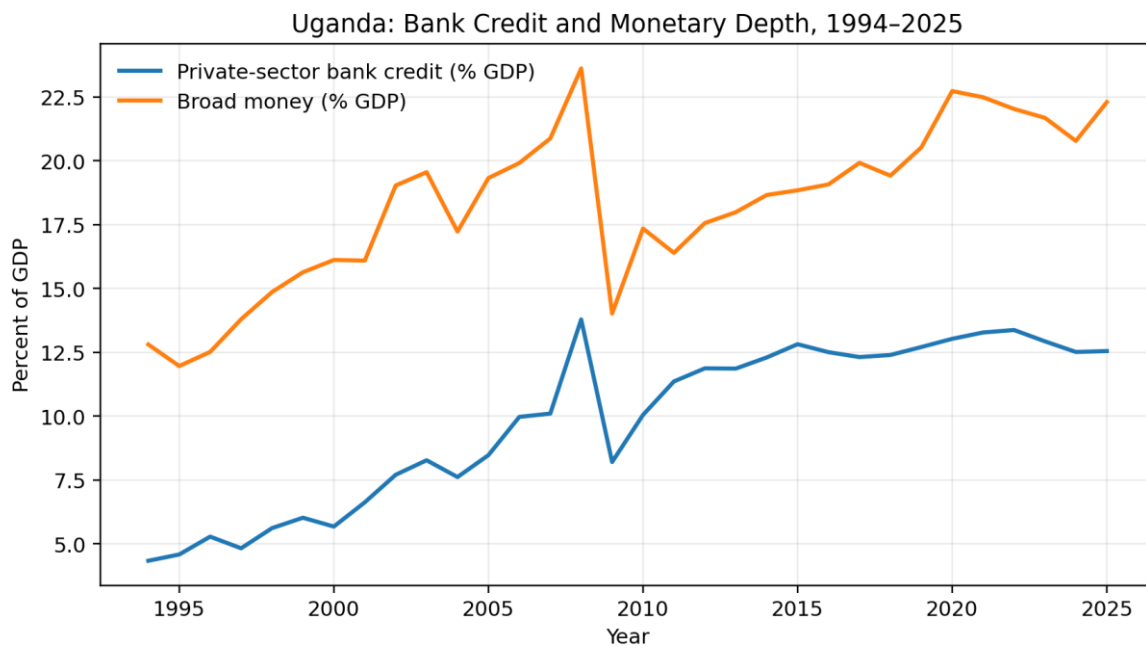


Figure 1: Uganda's Private Sector Bank Credit and Broad Money, 1994–2025

Source: Author's calculations from World Development Indicators data.

Study Results

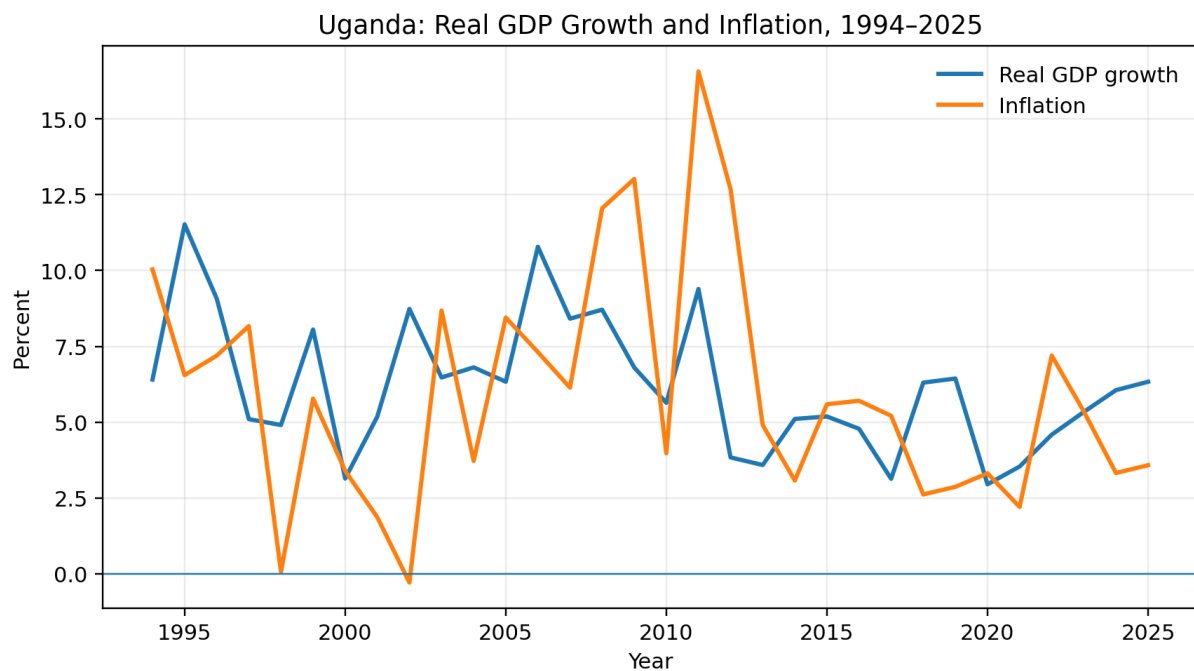
Our study results are discussed below

Table 2: Descriptive Statistics

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
Log real GDP	32	23.831	0.561	22.824	24.683
Real GDP growth (%)	32	6.208	2.203	2.951	11.523
Private credit (% GDP)	32	9.840	3.153	4.334	13.786
Broad money (% GDP)	32	18.283	3.175	11.961	23.618
Inflation (%)	32	5.947	3.835	0.288	16.564

Source: Author's calculations based on World Development Indicators data.

Real GDP increased markedly over the study period, and annual growth averaged 6.21 per cent. Private sector bank credit averaged 9.84 per cent of GDP, well below the broad money average of 18.28 per cent. The difference between the two averages confirms that broad money and private credit capture distinct dimensions of financial development; it does not, by itself, identify how the remaining financial liabilities were allocated. Although private credit and broad money followed a broadly similar long term pattern, their year to year movements differed.

**Figure 2: Real GDP Growth and Consumer Price Inflation, 1994–2025**

Source: Author's calculations from World Development Indicators data.

Stationarity and Model Selection**Table 3: Augmented Dickey–Fuller Results**

Series	Level p value	First difference p value	Integration conclusion
Log real GDP	0.070	<0.001	I(1)
Private credit	0.469	<0.001	I(1)
Broad money	0.188	<0.001	I(1)/trend sensitive
Inflation	<0.001	—	I(0)

Source: Author's calculations based on World Development Indicators data.

Note. Tests used an intercept and Bayesian information criterion lag selection. None of the variables was I(2).

The unit root results met the requirements for ARDL bounds testing because the variables were either I(0) or I(1), and none was I(2). On the basis of the Akaike information criterion, the selected specification was ARDL(2,2,2,2), estimated with a constant and deterministic trend and 30 effective observations after lagging.

Bounds Test and Short Run Estimates

The bounds test found no evidence of a stable long run cointegrating relationship. With an unrestricted intercept, an unrestricted trend and three regressors, the F statistic of 1.684 was below both the 5 per cent lower critical value of 4.01 and the upper critical value of 5.07 (Pesaran et al., 2001). The bounds test therefore provided no evidence of cointegration, and H4 was not supported. In Table 4, Δ denotes the first difference of a variable. The remaining results are interpreted as short run conditional associations rather than long run equilibrium effects.

Table 4: Short Run Unrestricted Error Correction Results

Term	Coefficient	Standard error	p value	Interpretation
Δ Private credit	0.0180	0.0055	0.005	Positive current year association
Δ Private credit (t – 1)	0.0140	0.0064	0.044	Positive one year lagged association
Δ Broad money	–0.0090	0.0036	0.024	Negative conditional association
Δ Broad money (t – 1)	–0.0075	0.0033	0.035	Negative one year lagged association
Δ Inflation	–0.0010	0.0013	0.458	Not statistically significant
Δ Inflation (t – 1)	–0.0019	0.0009	0.045	Small negative one year lagged association
Error correction/level term	0.1197	0.1550	0.451	Statistically insignificant; no evidence of adjustment

Source: Author's calculations based on World Development Indicators data.

Private sector credit had positive and statistically significant coefficients in both periods. Since the dependent variable was the change in log real GDP and credit was measured in percentage points of GDP, a one percentage point rise in the credit ratio was associated with an estimated 1.8 per cent increase in real output in the current year and a further 1.4 per cent increase after one year, holding the other model terms constant. Broad money had negative coefficients once

private sector credit and the other model terms were included. This shows how output changed with broad money when the private credit channel was held constant, not the overall effect of financial deepening. Our findings did not establish that deposit mobilisation harms growth, they instead reflected liquidity that was held for prudential purposes, invested in government securities or accompanied by other macroeconomic pressures rather than converted into private lending. Because broad money and private credit are conceptually related, collinearity may also affect the estimated sign and precision. Current inflation was not statistically significant, whereas inflation lagged by one year had a small negative coefficient. This pattern is consistent with a delayed response through real incomes, interest rates and investment decisions. The level term was also insignificant, supporting the bounds test conclusion that the variables did not show reliable adjustment towards a single long run equilibrium.

Diagnostics

Table 5: Post Estimation Diagnostic Tests

Test	Statistic	p value/criterion	Conclusion
Durbin–Watson	1.949	Approximately 2	No evident first order autocorrelation
Ljung–Box statistic, 4 lags Q	1.988	0.738	No residual serial correlation
Jarque–Bera	2.670	0.263	Residuals approximately normal
Shapiro–Wilk	0.966	0.432	Residuals approximately normal
Breusch–Pagan Lagrange multiplier (LM)	10.311	0.589	Homoscedasticity not rejected
Autoregressive conditional heteroscedasticity (ARCH) LM, 3 lags	3.323	0.344	No ARCH effect

Source: Author's calculations based on World Development Indicators data.

At conventional significance levels, the tests provided no evidence of serial correlation, nonnormal residuals or heteroscedasticity. Given the small sample, however, these results do not rule out omitted variables or structural instability.

Based on all the above results, it is important to note that the private credit are consistent with the supply leading view in the Ugandan context. Bank lending can ease working capital constraints and finance investment when funds reach private borrowers, while the positive lagged coefficient suggests that some financed activities take time to affect measured output. The result also supports the view that country conditions matter and that regional estimates need not reproduce Uganda's short run experience (Bist, 2018; Ibrahim & Alagidede, 2018).

The broad money result shows why financial depth should not be judged by a single quantity measure. While higher broad money may reflect monetisation and deposit mobilisation without showing whether banks provide longer term credit, invest in sovereign assets or lend to productive sectors negative coefficient is conditional on private credit and the other model terms and should not be interpreted as the total effect of monetary depth. The negative

coefficient should therefore be interpreted only as a conditional association showing that broad money and private credit related differently to output within this specification, collinearity prevents a firm conclusion about its sign or magnitude. This interpretation agrees with Benczúr et al. (2019), who emphasise financing structure, and Machado et al. (2021), who distinguish financial quality from financial size.

The absence of cointegration does not mean that finance was unrelated to growth because Uganda's financial system changed substantially between 1994 and 2025 through bank consolidation, prudential reforms, credit reference services, mobile money, agency banking and fiscal expansion. These changes may have altered the relationship between money, bank statements of financial position and economic activity, making a single long run equation restrictive for the study period. The positive private credit coefficients suggest that lending strategy should emphasise the productive use of credit rather than growth in loan balances alone. However, because the aggregate data do not measure affordability, maturity, sectoral allocation or credit quality, these mechanisms remain explanations for future testing rather than findings of our study. Measures that improve credit information, movable collateral registration, insolvency resolution, competition and access to long term funding may strengthen private lending, while price stability remains relevant given the negative lagged inflation coefficient.

Conclusion

This study set out to examine the short run and long run relationships among private sector bank credit, monetary depth, inflation and real economic output in Uganda from 1994 to 2025. The results show that private sector bank credit was positively and significantly associated with real output in the current year ($\beta = 0.0180$, $p = 0.005$) and after one year ($\beta = 0.0140$, $p = 0.044$). Within the estimated model, a one percentage point increase in private sector bank credit as a proportion of gross domestic product was associated with an estimated 1.8 per cent increase in real output in the current year and a further 1.4 per cent increase after one year, with the other variables held constant. The lagged result is particularly relevant because businesses may require time to convert borrowed funds into working capital, productive assets and expanded operations before the benefits appear in measured output.

Broad money produced a different result. It was negatively associated with real output in the current year ($\beta = -0.0090$, $p = 0.024$) and after one year ($\beta = -0.0075$, $p = 0.035$), once private sector credit and the other model variables were taken into account. This finding does not mean that deposit mobilisation or an expansion in the money supply necessarily harms economic growth. Instead, it suggests that greater monetary depth may have limited benefits when the additional liquidity is held for prudential purposes, invested in government securities or not converted into affordable credit for businesses and households. Broad money and private sector credit are also closely related measures, which means that possible multicollinearity may have affected the estimated signs and magnitudes. The result should therefore be interpreted cautiously as a conditional association rather than as evidence of an overall harmful effect of monetary expansion.

Inflation appeared to influence economic activity with a delay. Current inflation was statistically insignificant ($\beta = -0.0010$, $p = 0.458$), whereas inflation after one year had a small negative and statistically significant association with real output ($\beta = -0.0019$, $p = 0.045$). This

pattern is understandable because rising prices may take time to affect household purchasing power, production costs, lending rates and investment decisions. Although the estimated effect was small, it reinforces the importance of maintaining price stability if bank lending is to contribute meaningfully to productive activity.

The bounds test did not establish a stable long run relationship among the study variables. Its F statistic of 1.684 was below the 5 per cent lower and upper critical values of 4.01 and 5.07, respectively. The reported coefficients must therefore be understood as short run associations rather than permanent long run effects. They also do not prove that changes in credit, broad money or inflation caused the observed changes in real output. The absence of cointegration may partly reflect the substantial transformation of Uganda's financial system over the study period, including banking reforms, mobile money, agency banking, credit reference services, changes in prudential regulation and increased domestic government borrowing. These developments may have altered the relationship between finance and economic activity at different points in time.

The positive private credit results are consistent with the supply leading view that financial intermediation can support economic activity by directing savings towards productive investment. However, the contrasting results for private credit and broad money show that the size of the financial system does not tell the whole story. What matters is whether available funds reach productive borrowers on affordable terms and are used for activities that generate output and employment. In this respect, the study adds to the existing literature by showing that the allocation, structure and quality of financial intermediation deserve as much attention as monetary depth itself (King & Levine, 1993; Beck et al., 2000; Levine, 2005; Benczur et al., 2019; Machado et al., 2021).

The findings have practical implications for the Bank of Uganda, commercial banks and fiscal authorities. Policies should encourage affordable and sufficiently long-term lending to productive sectors while strengthening credit information systems, movable collateral registration, insolvency resolution and competition within the banking industry. Careful management of domestic public borrowing may also reduce the incentive for banks to direct a large share of their resources towards government securities instead of private investment. Financial sector performance should consequently be assessed using the affordability, maturity, sectoral allocation and quality of credit, rather than relying mainly on the growth of broad money or bank balance sheets.

These conclusions should nevertheless be considered alongside the limitations of the study. The analysis relied on annual aggregate data and a relatively small sample, which did not allow differences among banks, industries or borrower groups to be examined. The model also did not directly include lending rates, loan maturity, nonperforming loans, fiscal deficits or institutional quality. Future research could address these limitations by using quarterly, bank level and sectoral data, testing for structural breaks and examining alternative model specifications. Such research would provide a clearer account of how Uganda's financial system transmits resources to the real economy and would help policymakers design measures that support inclusive and sustainable economic growth.

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Author Contribution Statement:	All authors contributed equally to the conceptualisation, methodology, analysis, review and editing of the manuscript, and all authors approved the final version.

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