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Domestic Debt and Growth of Credit To the Private Sector in Uganda

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Abstract: This study examines the effect of domestic debt on credit to the private sector, causality, and structural breaks in credit available for the private sector. Using the Auto Regressive Distributive Lag (ARDL) approach and two-step Granger causality test, evidence shows that domestic debt is negatively related to credit to the private sector in the short run as well as the long run. The study also finds a one-way Granger causality from private sector growth in credit to domestic debt, and it further reveals that the structural break variable significantly impacts credit to the private sector. The results indicate that, in the short run, private sector credit growth is positively influenced by its performance during the previous two quarters in that greater expansion of private lending during the previous quarters leads to greater private sector credit growth during the current period. Specifically, a one percent increase in Corporate credit in the most rerise in commercial cent past quarter increases current growth by 0.42 percentage points and by 0.2 percentage points for the second most recent quarter, while other variables are held constant. The study advises the government to monitor the amount of bank capital tied up in long-term government securities and avoid rapid policy reversals. Commercial banks should be cautious against over-investing in long-term government securities because rising domestic debt and declining growth in credit to the private sector can impose pressure on liquidity, and hence internal discipline on lending to government securities makes sense.

Keywords: *Domestic Debt, Private Sector Credit Growth, Uganda*

1. Background

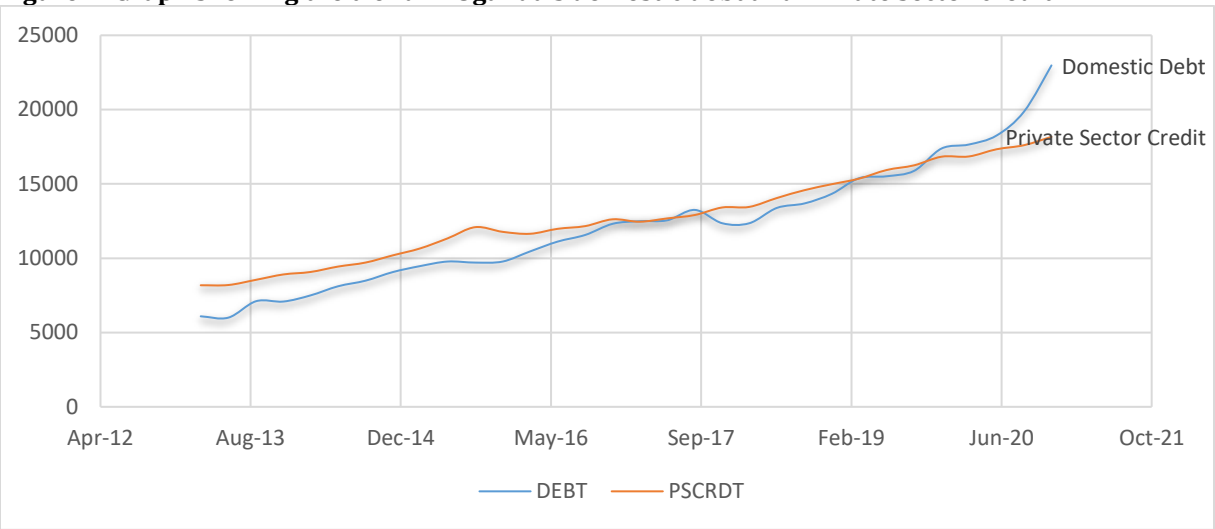
Private sector financing facilities are a fundamental force behind private enterprises' productive potential in economies worldwide (Silva, 2020). It has always been clearly shown from empirical analysis in multi-country and country-specific studies that rapid growth in private sector credit is the force behind movement towards private sector-driven economic growth significantly in developing nations (Kiriga, Chacha, & Omanyo, 2020). Those countries that fail to expand commercial loans risk constraining their businesses' productive potential, hence decelerating economic growth in general (Waeyenberge & Bargawi, 2018).

Tafirenyika (2016) further contributes that sluggish growth of the private sectors of African economies is one reason why the industrialization of the continent has been stagnant and exacerbates economic diseases like unemployment, poverty, and low incomes, and low revenues of the government from taxation. One key driver of such slow growth is constrained access of private companies to bank credit. This is a pattern that cuts right across Uganda, where despite three decades of adopting a private sector-led development strategy, the economy has not changed. Most private sector businesses remain informal, unorganized, and operate primarily as sole proprietorships (Ggoobi, Wabukala, & Ntayi, 2017). Correspondingly, the Ugandan government has actively invested in key production infrastructure such as electricity, roads, and security, seeking to provide an enabling environment for private business to flourish. In 2012, the government established a policy shift to borrow at home in order to finance its budget, hence having a considerable portion of government investment spending being financed through domestic debt from the same financial institutions lending to the private sector. Credit growth to the private sector has, during the past seven years, been minimal at 2.6%, allowing domestic debt, which grew at approximately 4.5% by the year 2019, to surpass private sector credit. Credit to the private sector stands at approximately 19.7 trillion shillings, while domestic debt stands at approximately 28.4 trillion shillings.

Theoretically, domestic debt is also one of the major constraining factors of credit availability to the private sector, as supported by a number of empirical exercises (Omodero, 2019; Silva, 2020). In instances where government borrowing is done locally, it competes with private enterprises for a limited amount of credit. Because government borrowing is considered to be more secure than lending to riskier private companies, credit requests from governments are preferred over private company requests by financial institutions. This

situation creates crowding-out as private sector businesses are excluded from acquiring funds, which can threaten their business. Domestic debt has, nonetheless, exceeded 28.4 trillion shillings and is still on the increase in Uganda, while private sector credit is still at 19.7 trillion shillings. This study utilizes the domestic debt crowding-out theory (Omodero, 2019) to examine the causal link between financing available to the private sector and domestic debt in Uganda.

Figure 1: Graph showing the trend in Uganda's domestic debt and Private sector credit.



From the graph, Uganda's domestic debt appears to move below private sector credit since 2012 until it finally exceeds it in 2019 and appears to diverge from it in 2020.

Statement of the Problem

Uganda is attempting to achieve higher economic growth over the long run by increasing private enterprises' capacity to produce more in a strategy known as private-sector-led growth. (World Bank, 2017). The government has started investing in cost-saving infrastructure to render the business climate conducive for private enterprises to expand. Because a big portion of the government investment expenditure is obtained from the same commercial banks that give loans to the private sector, the government devises expansionary plans, there is a growing problem of shrinking private sector credit in Uganda. This is risky because most private businesses utilize bank credit to grow and expand. (Nzibonera & Waggumbulizi, 2020). Private sector credit which has been growing at a mere 2.6% in the last seven years was outcompeted by government domestic debt that grew by 4.5% over the same period. Nampewo (2020) explains that a low level of growth in private sector credit can constrain growth in private sector investment and thus cause the nation to miss development targets. This is most likely to be happening in Uganda, since most private businesses are not able to access bank credit because it is costly. (Lakuma, Marty, & Muhumuza, 2019). A significant proportion of Small and Medium Enterprises (SMEs) that accessed bank credit have lost the collateral property to financial institutions because of default (Nzibonera & Waggumbulizi, 2020). Although it is theoretically clear that government borrowings can crowd out private investments in an economy by draining the available private sector credit (Traum & Yang, 2015)Empirical evidence to confirm or disprove this assertion in the Ugandan context is still scant. This study thus aimed to establish the effect of domestic debt on the rise of commercial credit in Uganda.

2. Literature Review

Overview of Private Sector Credit Performance in Uganda

Credit to the Ugandan private sector has been increasing over time, although at a continually diminishing rate (Nampewo, Tinyinondi, Kawooya, & Ssonko, 2016). Private sector credit between 2008 and 2020 increased from approximately 3,405 billion shillings to approximately 18,165 billion shillings, while the growth rate between the two years reduced from approximately 17% to 8% (Bank of Uganda, 2020). Domestic debt

increased to around 26,044 billion shillings (Kasule, 2022). Private sector credit in 2020 consisted of Ushs 11,536.9 billion in local currency and Ushs 6,293.2 billion in foreign currency equivalent (Nabiryo, 2021). Credit approval for the private sector alone for the final month of 2020 was Ushs 1,199 billion, representing 71.6% of that which had been sought (Ojangole, 2025). Sectoral credit disbursement in December 2020 had trade recording the largest percentage at 23%, followed by building, mortgage, construction, and real estate at 21%, and personal and household credits at 16% (Kasule, 2022). Credit to agriculture, trade, and manufacturing subsectors decreased in December 2020 to 8%, 23%, and 8% respectively (MoFPED, 2020), from 14%, 24%, and 13% posted in the previous month (Nabiryo, 2021).

Theoretical Underpinning of the Study

The Debt Theory

Under debt theory in the neoclassical school of thought, domestic government borrowing crowds out private sector credit when lending rates increase to levels that discourage private borrowing (Omodero, 2019). The reason is that lenders prefer lending to the government since it is safer compared to lending to private businesses. Crowding-out is in its most intense form when higher interest rates literally limit the government and government institutions from borrowing, keeping individual companies and businesses from even bidding on loans. This mechanism is also referred to as the price channel of debt crowding. Furthermore, debt theory explains that credit in the private sector can be limited through the quantity channel, where the hesitation of lenders to lend available funds to private individuals and businesses lowers the aggregate supply of credit to the sector.

The Investment Theory

Keynes, in the 1930s, developed the notion of an independent investment function within the economy, which later became the core of all investment theories (Agidew, 2014). Keynesian economics' contribution is that savings and investment, though theoretically equal, are determined by different decision-makers (Vianna, 2023). That means there can be no guarantee that savings and investment will always be equal (Ohlin, 2024). One approach supported by Keynesian theory is the accelerator theory, a neoclassical model that helps explain the way macroeconomic variables propel private investment (Kilindo, 2016; Oehmke & Opp, 2025). An example is the flexible accelerator model, which suggests that the higher the gap between actual and desired capital stock in a company, the higher the rate of investment needed to fill the gap (Vianna, 2023). Firms are assumed to aim at bridging the gap between their desired and actual capital stock stepwise (Cristiano & Marcuzzo, 2018). According to this structure, net investment can also span explanatory variables such as production, the price of external finance, and other determinants of the desired capital stock (Oehmke & Opp, 2025). This framework allows for the inclusion of domestic debt as an investment determinant, thus setting the proper basis for this study to examine (Ohlin, 2024).

The study selects these theories because they explain the state of the investment climate in Uganda. Government domestic debt is increasing rapidly above private sector credit, while businesses are failing to access credit or losing their collateral to the lenders, pointing to a possible crowding-out effect. At the same time, the continuous endeavor of businesses to seek credit even from the expensive lenders is indicative of their desire to increase their capital stock.

Empirical Literature Review

Numerous studies, both globally and across Africa, have investigated the impact of domestic debt on credit extended to the private sector. Most studies aim to determine if domestic debt reduces private investment in countries that incur large amounts of domestic borrowing. Some of the researchers concentrated on the influence of domestic debt on private sector bank credit as a proxy for private investment, while others employed real GDP as a proxy for investment. Most of the research employed econometric methods, and the findings were inconclusive: some explained that domestic debt crowds out private investment, while others provided proof that domestic debt has the capability to crowd in private investment in certain contexts.

The Effect of Domestic Debt on Private Sector Credit Growth

There were some studies globally and in Africa that examined the impact of domestic debt on private sector investment, and the question of interest is whether domestic borrowing reduces private sector credit. Moussa

and Shawawreh (2017) worked from 2000 to 2015 for Jordan and, using Ordinary Least Squares regression, concluded that domestic debt was relevant in the short term but not in the long term with respect to economic growth. Similarly, Gangadharan and Padmakumari (2016) used the ARDL approach on India's data covering 1980-2014 and discovered that domestic debt negatively affected economic growth in the short run but insignificantly affected it in the long run. Ozdemir and Gomez (2020) used a neoclassical model of investment function and the ARDL approach with data covering the period 1980-2013 for the Gambia and concluded that domestic debt exercised a negative impact on private investment in the short term but not in the long term. Perveen and Munir (2017), however, in Pakistan concluded a long-run crowding-out of domestic debt by bank credit using ARDL along with the theory of loanable funds. In Ghana, Anning, Ofori, and Affum (2016) also discovered that household debt reduced short-run investment estimates of OLS in the period 1990-2015. Similarly, Lidiema (2018) also discovered in Kenya that household borrowing from the government affected private capital construction in the short run and long run with the use of the ARDL model.

In Nigeria, only short-run borrowing by the government to private sector growth existed which was replaced with the application of Structural Vector Auto Regression, according to Ado and Ibrahim (2019). Okon and Osinimu (2017) and others (Adegboye, 2017; Oke-Bello & Toriola, 2019) also asserted that interest on domestic debt was high and substituted small and medium private investment over the short term. Aimola and Odhiambo (2018) and Asaleye, Oladipo, and Obasaju (2018) cointegration tests also validated that domestic debt could have a negative impact on long-run private sector credit and Nigerian total production. Crowding-out effects were short-run and long-run based on some research. For instance, Akomolafe et al. (2015) using Johansen cointegration and Vector Error Correction Models proved that domestic debt reduced domestic investment in Nigeria both in the short run and the long run, an assertion which was also stated by Nwaeze (2017). Yet, Omodero and Alpheaus (2019) using OLS observed a very significant positive short-run effect of domestic debt on private sector credit.

Similarly, research work such as Kelikume (2016) and Omodero (2019) did not record a crowding-out effect but a crowding-in effect where domestic debt of medium intensity stimulated private investment. Nepal (Katwal, 2017), Sri Lanka (Thilanka & Ranjith, 2018), and Nigeria (Didia & Ayokunle, 2020) also confirmed that domestic debt can stimulate private investment and economic growth if contained. In the East African setting, Babu et al. (2015) established that domestic debt encouraged investment and regional economic growth based on the Solow model of growth. Briefly, the evidence is not unidirectional: most of the studies concluded a short-run negative effect of domestic debt on private investment but long-run effects differ with various studies producing negative, positive, or zero effects. Based on the above findings, the primary research objective of this study is to analyze whether domestic debt has a significant impact on credit to the private sector in Uganda in the short run under the null hypothesis:
H_{01}: There is no short-run effect of domestic debt on credit to the private sector in Uganda. The second objective is toward the long-run impact, examining if domestic debt has a meaningful effect on private sector credit in the long term, as the evidence was conflicting in previous research.
H_{o2}: There is no significant long-run effect of domestic debt on private sector credit growth in Uganda.

Causal Direction Between Domestic Debt and Private Sector Credit Growth
While there is enough evidence to link domestic debt to total economic activity and investment (Fatás et al., 2019), the literature has been unable to hold strictly a causal effect from domestic debt to credit to the private sector (Panizza & Presbistero, 2014). Reverse causality is particularly problematic when dealing with the connection between debt and private sector credit. Keynesian policy prescriptions and neoclassical optimal policy theory generally advocate that governments should spend and borrow during bad times and save during good times. In the event of long-run investment shocks (Makhoba, Kaseeram, & Greyling, 2019), countercyclical fiscal policy can create a long-run negative debt-growth relationship, wherein low activity creates more debt rather than high debt creating less activity. Most macro theory would lead one to believe that rising fiscal deficits and the resulting debt should keep private investment down. Cross-country evidence, though, is largely correlation and not causation, and it is difficult to know with any certainty if domestic debt reduces private investment. Some empirical findings have indicated more direct proof.

Huang, Panizza and Varghese (2018) analyzed nearly 550,000 firms across 69 nations from 1998 to 2014 and demonstrated a crowding-out effect, depicting how public debt can restrict private investment. Similarly,

Huang, Pagano, and Panizza (2020) examined local government debt and investment by firms in Chinese cities and depicted how public debt reduces the capacity of private firms to access credit, influencing their investment decisions. In Kenya, Kimani and Olweny (2018) examined the effect of government domestic debt, as represented by Treasury bills and bonds, on private sector credit as an investment proxy. They found a one-way causality of private sector credit to Treasury bills, in that expansion in credit leads to issuance of government debt. Amaning and Seidu (2020) also found the presence of a causality from private investment to Treasury bills. Instructor: In Indonesia, Sijabat (2020) tested causality between debt and economic development (1998–2018) using the Granger causality test and confirmed one-way causality from economic growth to foreign debt. These results contradict South African findings by De Vita, Trachanas and Luo (2018) and Ncanywa and Masoga (2018), who found a two-way causal link between private investment and debt. In Nigeria, Adedoyin, Babalola, Otekunri, and Adeoti (2016) applied Granger causality to test for relationships between domestic and external debt, economic growth, and external debt and domestic debt and established bidirectional causation between external debt and GDP but not any causal effect between domestic debt and GDP or domestic and external debt.

Overall, there is inconsistent evidence regarding the causal relationship between domestic debt and private sector credit: some studies have supported unidirectional causality, while others have shown bidirectional causality. The majority of the studies apply Granger causality tests to examine these mechanisms. Despite the international attention, research activity remains extremely scarce for Uganda. Under the third goal, this study seeks to determine whether there is a causal relationship between growth in private sector credit and domestic debt in Uganda under the null hypothesis.
H_{o3}: There is no causal direction between domestic debt and an increase in private borrowing in Uganda.

Structural Break And Private Sector Credit Growth
A structural break is thought of as an unanticipated change in a data series and could affect the values of parameter estimates. This study hopes to take hold of a shift in government debt policy in 2012, represent it as a structural break, and estimate its effect on private sector credit growth. While most of the reviewed studies are unanimous in their findings regarding a positive or negative effect of debt on domestic credit, none of them incorporates the effects of structural breaks. According to Eke, Eke, and Inyang (2015), the consequence of ignoring structural breaks when they actually do occur in economic relationships includes parameter bias resulting from model misspecification. This study will answer its objective number three by testing the following hypothesis;
H_{o4}: There is no significant effect of a structural break on private sector credit growth in Uganda.

3. Methodology

Research Design
The research applied a longitudinal study design with the quantitative method from 2006 - 2020. The design helps in the establishment of the relationships between variables as well as hypothesis testing for the effects of variables on other variables. This type of study design helps in the successful achievement of the study objectives.

Data Types and Sources
The study utilized secondary time series data. This is due to the fact that the variables to be examined are national aggregates whose data already exist in the national databases. Time series data were utilized as the study investigates one phenomenon over a defined period of time. Data were collected from the Bank of Uganda Website. These time series data were of quarterly frequency, ranging from the periods 2006q3 – 2020q4, i.e., approximately 58 quarters of fiscal years, which effectively encompass the pre- and post-policy-change period of domestic borrowing induced by monetary policy to deficit budget financing.

Model Specification
The study modified the private sector credit function modeled by Omodero (2019) to include variables important for Uganda's context as follows.
PSCG = f (DBT, LNT, INF, Dummy_DBT) …… (1)

Where: PSCG is Public Sector Credit Growth; DBT is Domestic debt, LNT is lending interest rate, INF is inflation, and Dummy_DBT is a dummy variable for the structural break proxying the policy shift to deficit budget financing.

The econometric form of the model in equation 1 will be expressed as

$\ln PSCG_t = \alpha_0 + \beta_1 \ln DBT_t + \beta_2 \ln LNT_t + \beta_3 \ln INF_t + \beta_4 \text{ Dummy_DBT} + \epsilon_t$ ……..(2)

Where t represents time, α is the model intercept, the βs are parameter estimates, and ϵ is the error term of the model. Ln is for natural log.

Variable Description and Data Source

The variables are defined according to the official definition of the Bank of Uganda, from where they were extracted. These are represented in the table below.

Table 1: Variable Description, Data Type and Source

Variables	Definition	A priori Expectation	Data Source
PSCG	Private sector credit Growth is the growth rate in loans borrowed by the private sector from financial corporations.	N/A	Bank of Uganda
DBT	Domestic Debt is Defined as the stock of Uganda shilling-denominated liabilities excluding the stock of domestic arrears, it includes Uganda shilling-denominated central government securities.	Negative	Bank of Uganda
LNT	It is the rate charged by lenders for a certain period as a percentage of the amount lent	Negative	Bank of Uganda
INF	Percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals	Negative	Bank of Uganda
Dummy_DBT	Dummy variable for the structural break	Positive / Negative	Computation

Source: Author's compilation

Model Analytical Techniques

Unit Root Tests

Before estimating the proposed model, the study used the ADF test (Dickey and Fuller, 1981) to test the variables for stationarity. If the unit root tests establish that the variables are not stationary individually, the study employs the ARDL cointegration method of Pesaran, Shin, and Smith (2001). The ADF test was employed because of its power and has a null hypothesis of non-stationarity, which will not be rejected if the t-statistic is larger than the critical values at any significance level. The unstable variables are the non-stationary variables and the stable variables are the stationary variables. Whether the variables in the model are stable or otherwise matters because it identifies the long-run relationship between them as well as the appropriate method of estimation.

Cointegration Test

The cointegration test was conducted in the research based on Gregory and Hansen (1996), which is a technique that factors in structural breaks. It is a better technique because standard ARDL bounds testing might not be valid where there are structural breaks. The Gregory and Hansen test is a test that tests the no hypothesis of no cointegration against the alternative hypothesis that cointegration exists with one regime shift at some point in time. The time of this shift is not specified but comes directly from the data. The test is able to ascertain whether or not changes occur within the intercept and/or the slope of the variables.

Granger Causality Test

The research conducted the Granger causality test between an increase in business credit access and domestic debt to answer the second research aim. Causality testing helps ascertain cause and effect between two (and above) variables. A variable, say X will be referred to as Granger-causing another variable, say Y if the past values of variable X possess the capability of explaining the present values of variable Y (Korsah & Gyimah, 2019). The null hypothesis for the test is that lagged x-values don't explain y-variability, and cannot be rejected if the corresponding F-statistic is less than the critical F-value. The model employed for the causality test was specified as in equations 3 and 4.

$PSCG_t = \Sigma\, \pi i\ LnDBT_{t-1} + \Sigma\, \tau j\ LnPSCGT_{t-1} + \mu t$ …… (3)

$DBT_t = \Sigma\, \alpha i\ LnPSCG_{t-1} + \Sigma\, \delta j\ LnDBT_{t-1} + \mu t$ …….. (4)

Where $\pi i = 0$, $\tau j \neq 0$, $\alpha i = 0$ and $\delta j \neq 0$.

Model Estimation

The ARDL model was used in the current paper. The unit root tests indicated that the variables under study were of mixed orders of integration and therefore the ARDL approach was most appropriate to use. ARDL is an advantage in the sense that it offers short-run and long-run estimates, and the approach also addresses feedback effects. Pesaran, Shin, and Smith (2001) constructed an ARDL model that contains a Bounds test for Cointegration to analyze long-run relationships and dynamic linkages between the variables. It is more powerful than the standard cointegration tests in determining the cointegrating vectors. The ARDL also generates, through a linear transformation, an Error Correction Model (ECM) that is used to include short-run corrections to the long-run equilibrium. It does this without losing long-run information since it is taking sufficient lags to cover the data-generating process in general, as well as to specific model specifications. The ARDL approach is also appropriate for the smaller samples like the one to be used here and can always be used whenever the underlying regressors are integrated of any order less than I(2).

The study thus transformed equation 2 into the ARDL form as presented in equation 5 below.

$\Delta LnPSCG_t = \alpha_0 + \beta_1\ LnDBT_{t-1} + \beta_2\ LnLNT_{t-1} + \beta_3\ LnINF_{t-1} + \beta_4\ Dummy_DBT_{t-1} + \sum_{i=1}^{n} \theta_1\ \Delta LnPSCG_{t-i} + \sum_{i=1}^{n} \theta_2\ \Delta LnDBT_{t-i} + \sum_{i=1}^{n} \theta_3\ \Delta LnLNT_{t-i} + \sum_{i=1}^{n} \theta_4\ \Delta LnINF_{t-i} + \sum_{i=1}^{n} \theta_5\ \Delta Dummy_DBT_{t-i}\ \mu ECT_{t-1} + \varepsilon_t$…(5)

Where θ_1, θ_2, θ_3, and θ_4 are the short-run dynamic coefficients, and $\boldsymbol{\mu}$ is the coefficient of speed of adjustment, which is expected to have a negative sign. *ECT* is the Error correction term. Δ represents the difference factor, while Ln shows the natural log form. $\boldsymbol{\varepsilon_t}$ is the error term.

Diagnostic Tests

Serial Correlation

The study examined serial correlation to ensure that the residuals were not related to their past values. The Breusch-Godfrey LM test was applied because it provides direct detection of autocorrelation. This method was preferred since the Durbin-Watson h-test often underestimates autocorrelation.

Normality Test

The study tested for normality to confirm that the error terms followed a normal distribution. It employed the Skewness and Kurtosis test to evaluate the residuals. The decision was based on whether the test statistics were significant at the 5% level.

Multicollinearity Test

The study assessed multicollinearity to check whether independent variables were highly correlated. It relied on pairwise correlations, tolerance values, and the Variance Inflation Factor (VIF). The thresholds used were tolerance values below 0.2 and VIF values above 10.

Data Analysis

After downloading the data, it was put into a Microsoft Excel spreadsheet, whereby it was arranged chronologically, and the different variables were properly labelled with distinct variable names. The researcher ensured that all data points remained as numeric entries, and the data were later transferred into the STATA statistical package for analysis. During the analysis, descriptive statistics of the data were extracted in an effort to comprehend the nature of the variables' distribution. Correlation analysis was also performed in an effort to

test for the nature of relationships between the study variables. The data collected in this research were strictly used only for academic purposes.

4. Findings

Pre-Estimation Diagnostic Tests

Stationarity Tests on the Model Variables

Stationarity of the model variables was also tested using the ADF test, which is widely applied in the literature. The ADF test employs the null hypothesis that a given time series possesses a unit root and tests for unit roots. If the value of the t-statistic is lower than the critical value under the level of significance 5%, the null hypothesis cannot be rejected. For the sake of this study, variables were subjected to unit roots both in levels and first differences, as shown in Table 2 below.

Table 2: ADF test results

ADF			
Variables	**Levels**	**First difference**	**Integration**
LnPSCG	-4.076***	-	I(0)
LnDBT	-0.314	-5.530***	I(1)
LnLNT	-2.054	-7.373***	I(1)
LnINF	-3.329**	-	I(0)

Source: Researcher's computation using secondary data

The findings in Table 2 indicate that while some variables (LnPSCG and LnINF) are level-stable (order zero I(0) integrated), other variables become stable only after once-differencing (LnDBT and LnLNT) (they are I(1) integrated). The results thus indicate the concerned variables are of mixed orders of integration. This then means LnPSCG and LnINF have no unit root, but DBT and LNT have a unit root.

The Test For Cointegration

After considering the possible structural breaks in the data, the paper employed Gregory and Hansen's (1996) ARDL cointegration test to test for long-run relationships between the variables. Since traditional limit tests are unreliable when structural breaks are present, the test is best employed in ARDL models. The Gregory and Hansen method compares the potential for cointegration under a unique, unspecified change in regime with the null of no cointegration using an extension of the conventional ADF, Zα, and Zt tests. The evidence is used to estimate the change date, which is not predetermined. The final model is selected by using an information criterion to identify the most suitable lag length, and the test includes the intercept and/or slope change in the variables.

Table 3: Cointegration test results

Model	ADF	Break Date	Critical Value (5%)
Model One: (Constant)	-6.98**	2011q3	-5.28
Model Two: (Constant & Trend)	-7.03**	2011q3	-5.57
Model Three: (Constant & Slope)	-7.14**	2012q2	-6.00

** Indicates significance at 5% level. Source: Researcher's ARDL computation using secondary data

Table 3 indicates the findings of the Gregory-Hansen cointegration test, presented in terms of the ADF statistic of the Gregory-Hansen approach. Among the estimated models, Model Three best described the interaction between LnPSCG and the independent variables as it posted the highest absolute value of the ADF. This model

picked up on changes in the slope and intercept, as well as using the fewest lags according to the Schwarz Information Criterion (SIC), rendering it the most suitable choice. Samour and Isiksal (2020) cite that the SIC is beneficial in determining the optimal length of a lag, especially with small samples of time series. The ADF statistic confirmed that the variables are cointegrated and there is a structural break occurring in the second quarter of 2012. This break coincides with a policy shift by the government, when local borrowing began being used to finance the budget rather than for monetary stability. In order to account for this change, the study incorporated a dummy variable in the ARDL model equal to 0 before 2012Q2 and 1 after.

Serial Correlation Test

To check for serial correlation in the model, the Breusch-Godfrey LM test was employed. The test, under the null hypothesis, relies on the assumption that there is no serial correlation. The hypothesis would be rejected using a chi-square statistic and a 5% significance level. The null hypothesis was, however, held since the calculated chi-square statistic of 0.065 was not significant at 5%. This showed serial uncorrelation in the model. Section 4.3 provides a complete presentation of results.

Heteroscedasticity Test

To determine whether heteroscedasticity existed in the model, the Breusch-Pagan test was used. In this instance, constant variance (no heteroscedasticity) is the null hypothesis. The null hypothesis is not rejected if the chi-square statistic is not significant at the 5% level. The null could not be rejected in this instance since the chi-square value (0.00) was not significant at the 5% level. As a result, the model was determined to be heteroscedastic. Table 4 tabulates the results.

Table 4: Serial correlation and Heteroscedasticity test results

Test	lags(p)	Chi(2)	df	Prob.
B-Godfrey test	1	0.065	1	0.7981
Breusch-Pagan		0.00		0.9708

Source: Researcher's computation using secondary data

Test For Normality of Residuals

The Skewness & Kurtosis test for Normality was used in the study to examine the distribution of residuals in the model. The residuals are assumed to have a normal distribution by Ordinary Least Squares (OLS). Normalcy is the test's null hypothesis. The null hypothesis is accepted if the chi-square value, skewness, and kurtosis values are not significant at the 5% significance level. Table 5 presents the findings.

Table 5: Skewness & Kurtosis tests for Normality results

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
Residuals	58	0.4287	0.0001	12.84	0.0016

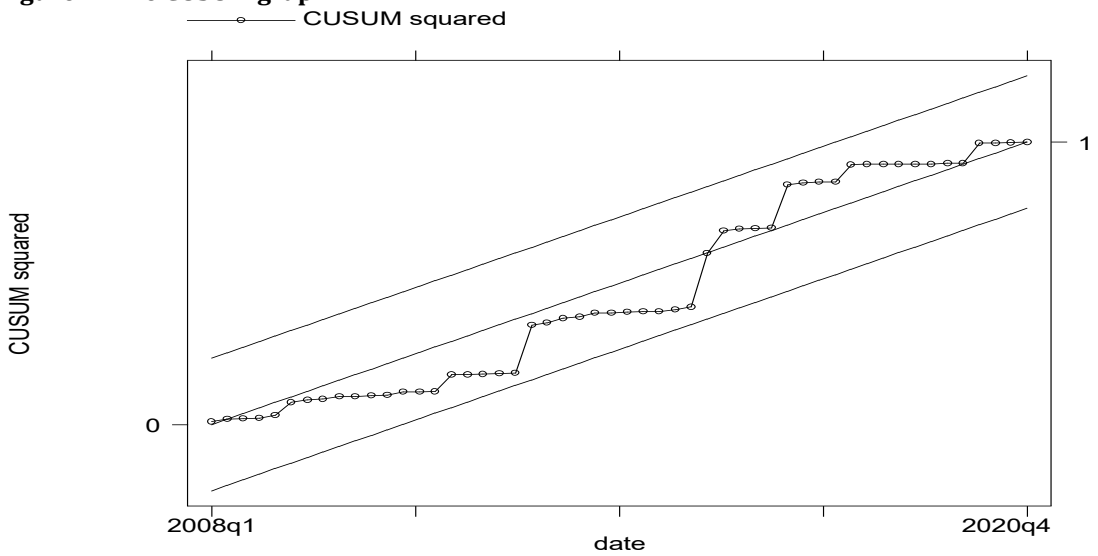
Ho: Normality. Source: Researcher's computation using secondary data

Table 5 findings show that the chi-square statistic, as well as skewness and kurtosis measures, are all significantly different from zero at the 1% level. This is the indication of rejection of the null hypothesis for normality, thus showing that model error terms are not normally distributed. Such non-normality is common in studies involving small samples, and it is most likely that the small dataset used in the case here resulted in it. However, as Maydeu (2017) indicates, non-normal residuals do not invalidate parameter estimates if other issues like heteroscedasticity do not arise. Provided that no other econometric problems were detected, the study concluded that non-normality of the residuals does not invalidate the model.

Test For Model Stability

The purpose of the test was to determine the stability of the estimated model. The test known as Cumulative Sum (CUSUM) was applied. Plotting recursive regression residuals against potential model break points under 5% critical boundaries of significance serves as the basis for the test. If the CUSUM of residuals falls under the 5% crucial boundaries, the model will continue to be stable. Figure 2 below shows a graphic representation of the test results.

Figure 2: The CUSUM graph



The graph shows that the CUSUM of residuals, represented by the dotted line, stays within the two parallel lines marking the upper and lower 5% critical limits. Since the CUSUM remains inside these bounds, it indicates that the model is stable.

The Test For Multicollinearity

According to reports, multicollinearity can develop in a regression model when one or more independent variables exhibit strong correlations with one or more independent variables. This can lower the statistical significance and reliability of the variables involved. By first creating a correlation matrix for the independent variables and then figuring out the Variance Inflation Factor (VIF) for each variable, multicollinearity was investigated in the current study. The results are shown as follows:

Table 6: Pairwise correlation analysis results

	LnPSCG	LnDBT	LnLNT	LnINF
LnPSCG	1.0000			
LnDBT	-0.4154*	1.0000		
LnLNT	-0.4394*	0.1033*	1.0000	
LnINF	0.0636	-0.5516*	0.3466*	1.0000

* Indicates significance at the 0.05 level. Source: Researcher's computation using secondary data

Following the directive of Gujarati & Porter (2009) that whenever correlation of ±0.8 or higher indicates a serious multicollinearity problem, Table 6 is the correlation matrix and it shows that all the variables have coefficients below this threshold. Thus, extremely severe multicollinearity does not exist. To validate, the study computed the Variance Inflation Factor (VIF) for each independent variable in the model, the outcome of which is presented as follows:

Table 7: VIF Results

Variable	VIF	1/VIF
LnINF	1.88	0.531090
LnDBT	1.67	0.597168
LnLNT	1.32	0.755164
Mean VIF	1.63	

Source: Researcher's computation using secondary data

Suleiman (2019) states that to exclude the possibility of significant multicollinearity in the model, tolerance values should be greater than 0.2 and VIF values should be less than 10. It is evident from the data in Table 4.3

that all tolerance values are over 0.2 and all variable VIFs are less than 10. According to the study's findings, the variables would be incorporated into the model as a whole and would not result in robust multicollinearity.

Descriptive Evidence of The Study

To give a broad overview of the type of data, descriptive statistics were calculated. This was done to make sure the data was suitable for estimation; otherwise, the findings would be deceptive. Specifically, a table of numbers with the mean, minimum, maximum, and standard deviation was calculated. The STATA package, version 14, was used for data processing and analysis.

Summary Statistics of Study Variables

The summary statistics of the study variables are presented in Table 8 below, outlining the mean, maximum values, minimum values, and the standard deviations.

Table 8: Summary of study variables

Variables	Observations	Mean	Standard Deviation	Minimum	Maximum
PSCG	58	4.368448	3.846434	-2.59893	16.99861
DBT	58	8405.878	5637.209	1906.527	23704.29
LNT	58	21.34249	2.183922	18.49017	27.21843
INF	58	6.725059	4.423825	1.181527	22.35116

Source: Researcher's computation using secondary data

The descriptive analysis's primary goal was to determine how closely the observed data points matched the model. The findings indicate that the data are concentrated around the averages because the standard deviations are moderate when compared to the mean values. Despite their exceptional size, the standard deviations of the various variables in this study represent the usual variations in the economic circumstances of credit to the private sector. The small number of observations may be responsible for some of this variation (58). The study converted the variables to their logarithmic scales in order to lessen the effect of these variations.

Test For Granger Causality

Following the ARDL procedure's determination of the variables' long-term association, the study aimed to determine the direction of causality. Cointegration does not indicate the direction of the relationship, but it does imply that Granger causality would exist. The study used the paired Granger causality test to test causal relationships in a VAR system in order to prove this.

Table 9: Granger causality test results

Null Hypothesis	Chi2	Prob > chi2
LnDBT does not Granger-cause LnPSCG	5.5366**	0.019
LnPSCG does not Granger-cause LnDBT	1.0161	0.313

Notes: Sample period = 2006q4 - 2020q4, Number of observations = 57. Source: Researcher's computation using secondary data

Because the corresponding chi-square value is significant at the 5% level, the Granger causality test results show that the null hypothesis that LnDBT does not Granger-cause LnPSCG in the first equation can be rejected. Accordingly, household debt generates expansion in private sector credit. Since the chi-square value in the second equation is not significant, the null hypothesis—that LnPSCG does not Granger-cause LnDBT—cannot be rejected. This suggests that domestic debt is not Granger-caused by an increase in private sector borrowing. The test usually shows a unidirectional causal relationship between domestic debt and the expansion of private sector credit.

Model Estimation and Results

Given the mixed stationarity of the variables and the comparatively shorter period of the series in this study, the most suitable estimation method was the ARDL method. The method was observed to cope with small

samples effectively and can be capable of coping with variables of different integration orders. Enkoro (2016) points out that among the advantages of ARDL is that it can handle serial correlation and endogeneity issues if properly specified. With this method, private sector credit was regressed over domestic debt, policy change dummy, interest rates for lending, and inflation. The AIC optimum lag lengths for the variables, as a guide during the specification of the error correction version of the ARDL model, were 3, 3, 3, 1, and 3. The results of the error correction model are in Table 10.

Table 10: Results of the estimated ARDL model

Dependent Variable: **D(PSCG)**			
Independent Variables	Coefficient.	Std. Error	P>|t|
ADJ $LnPSCG_{L1}$	-0.152432***	0.2451832	0.000
Long Run			
LnDBT	-0.3829869*	0.212739	0.080
Dummy_DBT	-0.1039065**	0.4178406	0.018
LnLNT	-0.0304781*	0.0518032	0.056
LnINF	-0.9086003***	0.2948512	0.004
Short run			
$LnPSCG_{t-1.}$	0.4241594**	0.1700448	0.017
$LnPSCG_{t-2}$	0.2276791*	0.1207275	0.067
D(LnDBT)	-0.356815**	1.742156	0.048
$LnDBT_{t-1}$	0.850502	1.95797	0.667
$LnDBT_{t-2}$	1.410208	1.882492	0.459
D(Dummy_DBT)	0.178604**	0.8015241	0.032
$dummy_DBT_{t-1}$	-1.045619	0.7915339	0.195
$dummy_DBT_{t-2}$	-0.1943811	0.8223662	0.814
D(LnLNT)	-0.1477689**	0.1231245	0.023
D(LnINF)	0.108826**	0.443937	0.019
$LnINF_{t-1}$	0.8545849*	0.4431739	0.062
$LnINF_{t-2}$	0.100490**	0.3908913	0.014
Constant	11.67464***	3.175496	0.001

Notes: D = First difference in variable. ***, **, * Indicate significance at 1%, 5% and 10% levels respectively. ARDL regression (3, 3, 3, 1, 3). Source: Researcher's ARDL computation using secondary data

The error correction term in error correction is statistically significant at 1% and its coefficient is -0.152432, which verifies the rate at which the model converges towards long-run equilibrium after a short-run shock among the independent variables (Qamruzzaman & Jianguo, 2018). This indicates that following a shock in the short run, 15.2% of the disequilibrium decreases in the subsequent period.

Short-run enterprise financing growth (PSCG) is influenced positively by its own performance during the previous two quarters. In other words, higher growth of credit in previous quarters results in higher credit growth for the current quarter. Specifically, when PSCG increases by a percent in the last quarter, the present PSCG increases by 0.42 percent, while when PSCG increases by a percent two quarters ago, the increase is 0.2 percent, other variables being equal.

Domestic debt (LnDBT) strongly suppresses PSCG in the short term; hence, domestic debt rises lower enterprise financing expansion and debt repurchases stimulate it. A rise in LnDBT by one percent reduces PSCG by 0.36 percent in the short run and there exists a long-run effect with a rise to a suppression of 0.38 percent. The structural break dummy (Dummy_DBT) is long- and short-run significant, signifying that policy change in domestic borrowing affects PSCG. The policy change is positive in the short run but negative in the long run, showing how macroeconomic variables respond to policy shocks.

Lending interest rates (LnLNT) are also in negative correlation with PSCG. A rise in lending rates by one percent lowers the credit growth by 0.48 percent in the short run and 0.03 percent in the long run. Inflation (LnINF), however, is positively correlated with credit growth in the short term because rising prices motivate businesses

to borrow more to ensure operations run on. A one percentage point increase in inflation raises PSCG by 0.1 percent in the short run with the effect traceable back to the first and second previous quarters corresponding to 0.85 and 0.1 percent, respectively. In the short run, inflation is favorable: an increase of one percent raises PSCG by 0.9 percent. This trend is reflective of the fact that while firms at first react to inflation through borrowing more, chronic inflation later deters them from repaying loans and thus restricts overall credit expansion.

5. Discussions, Conclusions and Recommendations

The Short-Run and Long-Run Effects Of Domestic Debt On Private Sector Credit Growth in Uganda

The results show that in the short term, private sector borrowing expansion (PSCG) is positively influenced by its own growth for the past two quarters. This means that higher growth in credit in earlier quarters tends to raise the current level of PSCG. Specifically, a one percent increase in PSCG during the last quarter corresponds to a 0.42 percent increase during the current quarter, and a one percent increase two quarters ago with a 0.2 percent increase, all else remaining constant.

Domestic debt (LnDBT) strongly negatively affects PSCG in the short term. Domestic debt levels are negatively correlated with credit growth, and domestic debt decreases are positively correlated with credit growth. The estimates show that the one percent increase in LnDBT lowers PSCG by 0.36 percent in the short run, and the negative impact continues in the long run with a minor increase to a fall of 0.38 percent. The dummy for the structural break (Dummy_DBT) is also significant in both the short and the long run, showing that the policy change in debt impacts PSCG. It stimulates short-term credit growth but has a negative effect in the long run, describing the behavior of macroeconomic variables to a change in policy. Lending interest rates (LnLNT) also have a negative influence on PSCG. A one percent rise in lending rates lowers credit growth by 0.48 percent in the short run and by 0.03 percent in the long run.

Inflation (LnINF) has a positive short-run effect on PSCG, which means that firms borrow more to maintain activity when there is inflation. An increase in inflation of one percentage point raises PSCG by 0.1 percentage point now, with additional effects of 0.85 and 0.1 percentage points apparent in the first and second preceding quarters, respectively. However, in the long run, inflation is negative, and a one percent increase reduces PSCG by 0.9 percent. This movement indicates that although businesses initially turn towards taking more amounts of credit when there is a declining currency, persistent inflation then restricts the financing scope of the business.

The Causal Direction Between Domestic Debt and The Rise in Credit to Businesses in Uganda

The second objective of this study was to establish the direction of causality between private sector credit expansion and domestic debt. The result shows one-way Granger causality from domestic debt to private sector credit expansion, that is, domestic debt movements dictate private sector credit movements, not the other way around. As the study has indeed found a negative relationship between private sector credit expansion and domestic debt, it follows that domestic debt is the cause of such a negative impact. Such evidence supports the premise of a crowding-out effect, as government borrowing confines available credit to the private sector. These same results were achieved by Obeng-Amponsah, Sun, Havidz, and Dey (2019) and Saungweme and Odhiambo (2019), who likewise determined causality from domestic debt to private sector credit and suggested that government-held domestic debt can be a cause of private lending. Again, this result is in contrast to the finding of Adedoyin, Babalola, Otekunri, and Adeoti (2016), who, using Granger causality tests in Nigeria, failed to determine causality between domestic debt and private sector credit.

The Effect of A Structural Break on the Rise in Commercial Credit in Uganda

The third objective of this study was to examine the effect of a structural break in private sector credit. The structural break that has been considered in this research is the sudden rise in domestic debt since the policy realignment by the Ugandan government from borrowing for monetary policy purposes to budget support borrowing. The break dummy variable was statistically significant, and hence, the null hypothesis is rejected. This means that the structural break of 2012Q2 had a significant impact on the growth of private sector credit. The change in policy boosted the growth of credit in the short term but produced a diminishing effect in the

longer term, which verifies that deficit finance through borrowing reduces private enterprise supply of credit. This is absolute evidence of the domestic debt crowding-out effect.

These findings confirm Zaheer, Khaliq, and Rafiq (2017), where government borrowing crowds out private sector credit in Pakistan under conditions of high-interest rate volatility, and Senibi et al. (2017), who found the debt to have a crowding-out effect and recommended fiscal reforms to contain it. The novelty of this study lies in the way it handled the break in domestic debt as an exogenous variable within the model. Domestic debt continued to exert a negative influence on private sector credit in Uganda even after adjusting for the break, confirming the persistence of the crowding-out effect in spite of the policy shift. This result is in line with Mohanty and Panda (2020), who used a structural vector autoregression model in India and suggested domestic debt should be efficiently managed and directed to productive ends to derive the greatest benefit to the economy.

Conclusion

The study concluded that private sector credit growth is Granger-caused by domestic debt and that private lending growth is negatively influenced by domestic debt in the short- and long-run. The significance of the short- and long-run structural break dummy variable showed that the structural break influenced commercial lending growth.

Thus, this discussion finds that the increasing domestic debt of Uganda is crowding out private companies by stifling the expansion of commercial lending. Further, the 2012 budget-supported domestic borrowing policy change remains an inhibitor to the slowing growth of private sector lending.

Recommendations

The observed negative impact of home country debt on credit in the private sector helps to highlight the need for more thoughtful domestic borrowing strategies, especially if the state intends to continue borrowing more without disadvantaging private firms. One simple measure would be relaxed regulations limiting the proportion of a bank's capital to be invested in government debt. Instead of leaving this wholly to the market, explicit investment limits may be set by the government, through the Bank of Uganda. Sudden changes in debt policy lead to both short- and long-term negative effects on business financing, so sudden policy shifts—particularly those involving local borrowing—need to be avoided.

Commercial banks also need to be careful against over-allocation of their own capital to long-term government securities at the expense of private sector lending on a short-term horizon. With growing domestic debt and reduced credit to the private sector, banks can face liquidity shortages. To counter this risk, banks need to incorporate built-in caps on the proportion of capital tied up in government bonds so that there is a balance between keeping liquidity intact and private sector lending.

Limitations of the Study

This study focuses only on credit to the private sector as recorded in commercial bank loans and thus most private sector credit outside the banking system goes unrecorded. Since most firms raise funds from alternative sources, the research sees only a part of the picture of overall private sector credit. In addition, the study covers a relatively short period of 14 years and thus has a small sample size. According to Penzin and Oladipo (2021), a duration of less than 20 years is short for effective time series analysis.

Areas Recommended For Further Research

Future studies are to consider including other sources of private sector credit so that a more comprehensive picture can be obtained of whether it is on the rise or on the fall in Uganda. Other researchers may also consider elaborating on how the capitalization of individual banks is affected by the investment of the banks in government bonds in the long term.

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