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Macroeconomic Determinants of Private Sector Credit in Tanzania: 1991–2018

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Abstract

Tanzania has undertaken significant changes that have altered the role of macroeconomic variables in the financial sector during the past three decades. These include deregulation of interest rates, combating inflation and improving macroeconomic performance, and increasing access to credit by the private sector. In this context, our study aims to analyse the impact of macroeconomic variables on bank credit to the private sector using annual data spanning from 1991 to 2018; the period after financial sector reforms. After performing unit root test and co-integration tests, the Vector Error Correction Model (VECM) was applied to establish the dynamic long–run relationship between macroeconomic variables, namely, GDP, the lending rate, inflation and private sector credit. From the results, it can be seen that all these three macroeconomic variables have contributed positively towards bank credit growth in the Tanzanian economy. The co-integration and the error correction model estimation results also suggest that the macroeconomic variables had a long-run relationship with bank credit. The study findings call for policy makers to observe the behaviour of lending rates, inflation and economic growth to enhance credit demand and stimulate investment and growth.

Keywords: inflation, financial intermediation, credit, vector error correction model.

1. Introduction

Financial sector development, with respect to the number and variety of financial institutions and instruments, is considered a prerequisite for economic growth and development. The 'growth and developmental roles' of the financial sector is realized from two main channels that constitutes what is referred to in the literature as the financial intermediation process. One is savings mobilization from the so-called 'surplus spending units' in the economy; and the other is channelling funds to 'deficit spending units'. This facilitates the use of savings mobilized to address private sector demand for credit for consumption and investment. Through the financial intermediation processes, financial institutions provide for optimal allocation of resources that ultimately lead to economic growth and improvement in soci0-economic wellbeing in an economy.

Notwithstanding, both savings mobilization and lending to the private sector by financial intermediaries are conditioned by both policy and non-policy factors. In a market economy, both saving and lending activities by private sector players are

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influenced by interest rate. Within this regard, saving and interest rate bear influence on portfolio choice behaviour of the 'surplus spending units'. Specifically, interest rate stands out as a measure of the opportunity cost of sacrificing—or rather postponing—current consumption to the future. In the case of lending, interest rate is the cost of funds charged to deficit spending units by financial intermediaries. Notable, both saving and lending interest rates are primarily determined by the monetary policy actions of the central monetary authority, that in turn depend on de facto monetary policy regime: contractionary or expansionary monetary policy regime. Similarly, the de facto monetary policy regime depends upon existing macroeconomic environment and, in relation, the desired course of its evolvement over time.[1]

The purpose of this paper is to investigate empirically the effect of interest rate and other macroeconomic factors on credit demand by the private sector players in Tanzania. The study is driven by three main reasons. One, is the importance of credit to the private sector, which is designated as the engine of economic growth in Tanzania. Second, is the importance of prudent monetary policy. On this, it is important to establish empirically—for policy inference—the impact of interest rates on lending to private *sector* by financial intermediaries in Tanzania. Third, is dearth of empirical evidence that have covered the preceding two issues. The study, therefore, is directed to fill the existing gap in the literature in Tanzania and beyond.

The rest of this paper is organized as follows. To motivate the econometrics analysis, section 2 presents the evolution of lending to private sector by financial intermediaries in Tanzania over the period 1991–2018. Section 3 presents the analytical framework, estimation model and methods. Empirical results are presented in section 4; and section 5 concludes the paper.

2. Evolution of Credit to the Private Sector in Tanzania

In theory, banks and other financial intermediaries in the formal financial system are the major sources of credit used by private sector to finance consumption and investment expenditures in an economy.[2] In relation, two epochs are identifiable in the supply of credit to the private sector in Tanzania. One, is the 'command economy

[1]In this context, through the financial intermediation process, financial institutions avail credit to the private sector for investment. The main role of banks in an economy is to provide financial services mainly involving the channelling of funds from surplus spending units to deficit spending units, which is known as financial intermediation. In the process, banks transform bank deposits into credit or loans. In recognition of the importance of credit, the Tanzanian banking sector has undergone structural changes and has been liberalized since the beginning of 1990s. Liberalization measures included government reforms to improve bank infrastructure, ownership structure, lending practices and capital requirement, and deregulation to allow increased competition. Interest rates have also been liberalized after a long period of deliberate low interest rate ceilings. On the price development side, inflation has been abated following anti-inflationary policies declining to single digit levels after 1990 from double digit levels during the 1980s.

[2]Developing economies have also been characterized by informal sources of credit, for example, money lenders, diverse types of rotating savings and credit societies (RoSCAs), etc., better referred to as informal financial institutions, mainly because they are not licensed, supervised, or regulated by a central bank.

epoch', and the other is the 'market economy epoch'. The command economy epoch commenced at the launch of the Arusha Declaration in 1967. The Declaration, first, led to the nationalization of private banks and non-bank financial intermediaries (NBFIs), and in their place established state-owned banks and NBFIs.[3]

Notable, first, the nationalization of the private financial institutions in Mainland Tanzania led to the existence in the country of a very narrow and highly segmented financial system consisting of: (i) a single state-owned commercial bank, namely the National Bank of Commerce (NBC), which was established out of the private banks and supplied short-term credit, mainly for trade; and (ii) a sector-based development finance institution—the Cooperative and Rural Development Bank (CRDB)—for agricultural production and crop purchases; and the Tanzania Investment Bank for the manufacturing sector.[4] Second, but in relation, the state-owned banks and the NBFIs were ostensibly entrusted with the role of mobilizing resources, but mainly for lending to preferred key sector of the economy, mainly the public sector which constituted of public sector enterprises, elsewhere referred to as parastatal organizations that were established by the government in key sectors of the economy: industry, agriculture, trade, etc.

In practice, lending to both private and public sectors by the banks and the NBFIs was at interest rate ceiling set by the central bank in the Annual and Finance Credit (AFCP), which was a monetary policy instrument conceived by the Government in 1972. Noteworthy here, nominal lending rates charged by banks and NBFIs were set at low levels by the central bank, mainly to make cheap credit available to public enterprises (PEs) for investment. The interest rate ceiling on credit had two main debilitating effects on the financial sector. First, it undermined savings mobilization as it translated to low nominal interest rates on savings deposits that remained constant and even negative in real terms over an extended period (Figure 1). Second, it led to excess demand for credit and non-performing assets in banks.

The market economy regime, in place since the government started to implement economic reforms sponsored by the International Monetary Fund (IMF) and World Bank in mid-1980s, was strengthened by a number of policy changes (BOT, 2007; 2015). First, was the enactment of the Banking and Financial Institutions Act (BFIA) in 1991 that lifted entry restrictions to the participation of private financial institutions in the financial sector, and increased the sources and varieties of credit

[3]There were only two government-owned insurance companies: the National Insurance Corporation (NIC), with a monopoly on the Mainland; and the Zanzibar Insurance Corporation (ZIC), which operated in Zanzibar. The pension funds were the National Provident Fund (NPF), Parastatal Pension Fund (PPF), the Government Provident, and the Pension Fund for the Central Government and a Local Government Authority Pension Fund providing facilities for central and local government employees. The Tanzania Investment Bank (TIB), the Tanganyika Development Finance Company Limited, and the Karadha Company, a hire purchase institution owned by the NBC, provided medium and long-term finance.

[4]Three thrift institutions—the Post Office Savings Bank, the Tanzania Housing Bank, and the Diamond Jubilee Investment, Trust—raised part of their funds through public deposits, but did not operate current accounts.

to the sector. In this regard, credit to the private sector has been supplied by diverse private and public financial institutions. Second, was the liberalization of the financial sector that led to a market-based pricing of financial products and assets. In practice, the BOT allowed banks and NBFIs to set own interest rates subject to a maximum lending rate of 31 percent and a 12-month savings deposit rate above the expected inflation rate (Ndanshau & Kilindo, 2016). Notable, lending rates rose as savings declined, leading to the existence of a widened interest rate spread commonly attributed to risks and other factors that bear influence on lending to the private sector in Tanzania.

Figure 1 shows that the growth rate of nominal financial savings mobilized by financial intermediaries in Tanzania decreased after the liberalization of the financial sector in 1991 to a low in 1999. Even though the savings mobilized thereof rose to two consecutive peaks in 2005 and 2007. Thereafter it declined to a low when the economy suffered from the global financial crisis in 2008. Notable, mobilization of financial savings recovered after the global financial crisis, but generally declined over the period 2009–2018. Therefore, *ceteris paribus*, the evolution of savings mobilization suggests the lack of increase in the lending capacity of financial intermediaries since the financial sector became liberalized in 1991. Figures 1-a and 1-b suggest the evolution of the volume of financial savings mobilized after the liberalization of the financial sector was not determined by the nominal lending interest rates, but by inflation rates.

Figure 1-a: ***Financial Savings and Interest Rate***

Figure 1-b: ***Financial Savings and Inflation***

Figure 2-a shows that the credit to private sector, by and large, depended on the savings mobilized by financial intermediaries, save for some unique years, i.e., 1996 and 2008. Moreover, Figure 2-b suggests the lending rates of financial intermediaries were not the determinants of the demand for credit by the private sector. Rather, it appears inflation was an important factor influencing the private sector demand for credit, more so since 2012. Figure 2-c suggests the existence of causality between economic growth and credit to the private sector in Tanzania during the sample period, especially since 1997.

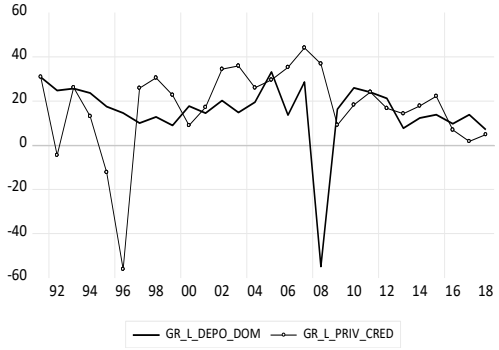


Figure 2-a: ***Private Credit and Deposits***

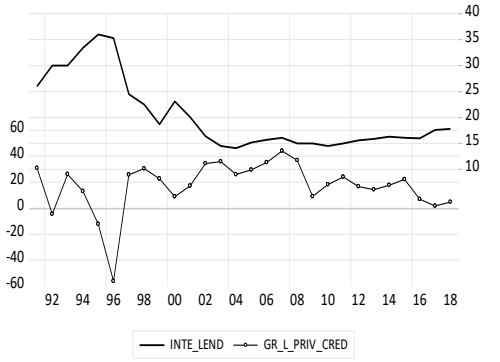
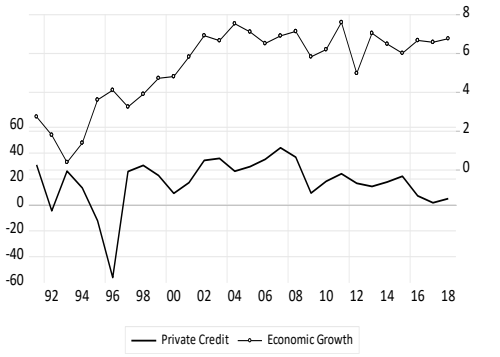


Figure 2-b: ***Private Credit and Interest Rate***

2-c: ***Private Credit and Inflation***



2-d: ***Private Credit and Economic Growth***

3. Theoretical Framework

A typical market economy constitutes diverse firms and households that are heterogeneous with respect to their initial resource endowment (wealth), sources and uses of income, demographic characteristics, and not least, tastes and preferences. The existing heterogeneity translates to segments of firms and households in an economy—or rather the private sector—if seen in the national income accounting context. These are the segments of 'deficit spending' and 'surplus-spending' firms and households. Typically, the surplus spending units save their excess of income over expenditure; deficit-spending units borrow to finance their excess expenditure over income, while some firms and households may exhibit a balanced budget, that is, income exactly equals expenditures.

In a market economy, deficit spending and surplus spending units are serviced by financial intermediaries, among others, commercial banks. To the deficit spending units, banks supply leverage funds for bridging the gap of the access of both consumption expenditure over income; and offer an avenue for saving to the

surplus spending units. The process by which banks mobilize savings from surplus spending units, and in turn lend to deficit spending units constitutes what is referred to as financial intermediation. Through financial intermediation banks enhance capital formation that promotes economic growth in two main ways: first, by supplying financial service to surplus spending units that serve an optimal allocation of resources; and second, by similarly supplying lending service to deficit spending units that serve optimal consumption and/or investment.

It is implicit that in the absence of the two avenues for savers and borrowers, there would exist a sub-optimal allocation of resources in an economy that would undermine economic growth. Specifically, in the absence of banks and other financial intermediaries and markets, surplus spending units would use sub-optimal avenues for saving, for example save in commodities that would be eaten by ants and rats (Gurley & Shaw,1960; Goldsmith, 1969; McKinnon, 1973; Shaw, 1973). On the other hand, deficit spending units would resort to sub-optimal self-finance, and/or become a prey of usurious moneylenders and other informal financial institutions and markets with little or no scope for financing either high return, lumpy (indivisible), or large investment in the private sector. Alternatively, deficit spending units would postpone consumption and/or investment and, as a result, undermine economic growth and social and economic wellbeing.

In view of the above, some credible empirical studies on developing countries attest to the existence of a positive impact of financial sector on economic growth and development in developing countries (Amidu, 2014; Olumuyiwa et. al., 2012; Olokoyo, 2011; King & Levine, 1993; Demetriades & Hussein, 1996; Levine et al., 2000; Beck et al., 2000; Beck & Levine, 2004). While saving is the 'beginning all' of the positive impact of financial sector on economic growth, the access to credit by the private sector is equally important for economic growth in developing countries. Available empirical studies on developing countries show that access to credit is determined by several factors. The prime policy-based factor is the cost of loanable funds, that is, the lending rates charged by banks and other financial intermediaries.

Second, is inflation. For example, a study by Kechick (2008) established the existence of a positive effect of inflation on private sector demand for credit in Malaysia. Also, a study by Iossiv and Khamis (2009), which covered 43 countries in Sub-Saharan Africa (SSA), found credit to the private sector was mainly influenced positively by per capita income, and negatively by interest rate. Similarly, a study by Abuka and Egesa (2000) concluded that income was one of the important factors that determined growth of credit to the private sector in the East African Community countries, including Kenya, Tanzania and Uganda. Furthermore, in a study of Pakistan, Imram and Nishat (2013) found that economic growth, foreign liabilities and the foreign exchange influenced private sector growth. Monetary conditions, inflation and the monetary market rate were found not to influence credit growth.

Most recently, Katusiime (2018) found positive effects on credit of three macroeconomic variables, namely income, inflation, and the lending rate in Uganda. The case of the influence of the lending rate is expected to be negative. The lending rate is related to monetary policy implemented by the central bank. During a recession the central bank implements expansionary monetary policy which increases money supply. Due to the increase in money supply, lending rates fall thus benefiting consumers and producers. Consumers might forgo future consumption and consume more now, while producers will borrow more at low interest rates and invest. There is a positive relationship postulated between deposit interest rate and bank activity. When there is an increase in the interest rate, bank loans are raised significantly. The role of interest rates as one of the factors that determine the level of savings has long been recognized, and empirical evidence has supported that (Ibrahim, 2006; Ndanshau & Kilindo, 2016; Tomak, 2013; Azira, 2018; Moussa & Chedia, 2018). The common measure of inflation is annual change in the CPI. A positive relationship has been established between inflation and credit demand in many studies. Risk-averse consumers may increase their precautionary savings because inflation increases uncertainty regarding future income growth (Harron & Azim, 2006).[5]

4. Econometric Estimation, Results and Discussion

4.1 The Econometric Model

The investigation of the effect of macroeconomic factors on the private demand for credit in Tanzania is based on a model that reads as:

$$\mathrm{CD}_t = \alpha_0 + \alpha_1 R_t + \alpha_2 \Delta\mathrm{CPI}_t + \alpha_3 \mathrm{y}_t + u_t \qquad (1)$$

Where, CD is demand for bank credit, which is determined by inflation (ΔCPI), the lending rate (R), and national income measured as gross domestic product (y), all in natural logarithms.[6]

In theory, the testable null hypotheses are thus: the effect of lending rate is not negative, that is, $\alpha_1 > 0$; and, the effects of inflation and GDP are not positive, that is, $\alpha_2 < 0$ and $\alpha_1 < 0$.

[5]The link between macroeconomic variables and bank credit has received attention in many studies with GDP being a major macro-variable being the investigated (see, e.g., Ibrahim (2006), Amidu (2014), and more recently Thaker et al. (2013) and Azira et.al. (2018). An increase in GDP will raise both supply and demand for loans. As GDP increases banks will have more funds to make loans due to an increase in the amount of deposits. This is in support of the generally agreed theory that financial development and economic development are correlated (Amidu, 2014; Olumuyiwa et. al. (2012); Olokoyo, 2011).

[6]The specification is confined to demand side factors and supply side factors are not included. Supply side factors are outside the scope of this study but have been analysed in Aikaeli (2006); Kilindo (2009;2019), Lotto (2016); Tessel (2008) and Swai and Mbogela (2014). In the analyses, bank-specific performance in terms of efficiency and profitability required inclusion of risk interest rate spread and risk variables. However, it is shown in Kilindo (2009; 2019) that supply-side variables like 'riskiness of borrowers' and interest rate spread are more linked to bank efficiency rather than overall credit. Banks increased loan loss provision share of assets and thus reduced credit quality to keep market share after foreign banks entry increased. Thus, the influence of risk on credit was somehow dampened.

4.2 Temporal Properties of the Data

Table 1 present descriptive statistics of the data used in the analysis.

Table 1:Descriptive Statistics

Variable	CD	R	ΔCPI	y
Mean	14.051	2.971	2.279	16.417
Median	14.071	2.815	2.067	16.453
Maximum	16.429	3.584	3.564	18.319
Minimum	11.996	2.646	1.482	13.898
Std dev.	1.648	.302	.653	1.359
Skewness	.146	.858	.514	-.189
Kurtosis	1.6	1.9	2.9	1.7
Jarque-Bera	0.553	0.737	5.172	8.756

The statistics in Table 1 reveal that all the variables of the estimation model are about normally distributed: the Kurtosis is less than three (3), and the Jarque-Bera statistic is statistically insignificant and suggests lack of potential autocorrelation problem.

4.3 Unit Root Tests

Unit root test is in vogue in econometrics, mainly in a bid to avoid spurious regression results. As it is better known, a variable is integrated of order 'd', that is, I(d), if it has to be differenced d-times before it becomes stationary. There exist several tests for unit root in time series data. The most commonly used in time series data is the Augmented Dickey-Fuller (ADF) test, which is associated with Dickey and Fuller (1979, 1981).

The ADF results presented in Table 3 reject the null hypothesis that all the variables of the estimation model were stationary, that is, I(0) in level. Rather, the results show that only income (*y*) is stationary in level, that is, I(0). Other variables of the estimation model are I(1) in level and first difference stationary; that is, they are I(0).

Table 2: Unit Root Test–Level

Variables	At level		At first difference	
	Test Statistic	***Order of Integration***	***Test Statistic***	***Order of Integration***
Y	-2.707***	I (0)	-3.099**	I (0)
CD	0.318	I (1)	-2.777***	I (0)
ΔCPI	-1.653	I (1)	-4.674*	I (0)
R	-1.202	I (1)	-4.415*	I (0)

Notes: The critical values are; 1 per cent (-3.750), 5 per cent (-3.000), and 10 per cent (-2.630). The asterisks (*), (**) and (***) represent the critical values 1 per cent, 5 per cent, and 10 per cent respectively. In brackets are the probability values.

4.3 Co-integration Test

Two or more variables can be integrated of different order but exhibit a long-run relationship, that is, be co-integrated, (have a long term or equilibrium

relationship) (Gujarati, 2009). In theory, this implies co-integrated variables will not drift further away from each other arbitrarily over the long-run (Johansen & Juselius, 1990, 1992; Pesaran et al., 1996; Pesaran & Shin, 1999).

There are several tests of co-integration but the Johansen-Juselius co-integration test is the most popular, or rather most commonly used approach.

Table 3: Johansen-Juselius Co-integration Tests (Trace)

Unrestricted Co-Integration Rank Test (Trace)				
Hypothesized No. of CE(s)	**Hypothesized No. of CE(s)**	**Eigen Value**	**Trace Statistic**	**Critical Value 5%**
r≥0	None	.	83.1964	27.07
r≥1	At most 1	0.86263	33.5688	20.97
r≥2	At most 2	0.50563	15.9572	14.07
r≥3	At most 3*	0.40826	2.8401	3.76
r≥4	At most 4	0.10739		

Notes: Trace test indicates 1 co-integration equation at the 0.05 level; and, *denotes rejection of the hypothesis at the 0.05 level.

The Johansen-Juselius test results presented in Tables 3 and 4 suggest that there exist at most 3 co-integrating vectors in the variables of the estimation model.

Table 4: Johansen-Juselius Co-integration Tests (Maximum Eigenvalue)

Unrestricted Co-Integration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE (s)	**Hypothesized No. of CE (s)**	**Eigen Value**	**Max-Eigen Statistic**	**Critical Value 5%**
r≥0	None	.	49.6276	27.07
r≥1	At most 1	0.86263	17.6116	20.97
r≥2	At most 2	0.50563	13.1171	14.07
r≥3	At most 3*	0.40826	2.8401	3.76
r≥4	At most 4	0.10739		

Notes: Trace test indicates 1 co-integration equation at the 0.05 level; and, *denotes rejection of the hypothesis at the 0.05 level.

4.4 Vector Error Correction Model

A vector error correction model (VECM), which is a restricted vector autoregressive (VAR) model, was estimated to establish short-run dynamics and long-run relationship between the variables of the estimation model in (1).

$$\Delta Y_t = \sum_{j}^{p} r_j \Delta Y_{t-j} + \mu_0 + \gamma_t + \alpha\beta Y_{t-1} + v_t \qquad (2)$$

where ΔY is a first difference of the vector of the variables of the estimation model; μ_0 is a vector of intercepts; r_j is a vector of coefficients; α is the leading matrix, β is co-integration vector, and$t$ is time signature.

Statistical significance of the error correction term (ECT) (-1) coefficient decides how fast the equilibrium is stored (Abdullah et al., 2011).

Table 5: VECM Results

Variables	Coef.	Se	t-value	p-value	Sig
Ee_{t-1}	-0.239	0.045	5.32	0.000	***
ΔCD_{t-1}	-0.416	0.120	-3.46	0.001	***
ΔCD_{t-2}	-0.639	0.132	-4.83	0.000	***
ΔR_t	-0.397	0.150	-2.64	0.008	***
ΔR_{t-1}	-0.129	0.113	-1.14	0.253	
ΔCPI_{t-1}	-0.094	0.044	-2.13	0.033	**
ΔCPI_{t-2}	0.069	0.043	1.59	0.112	
Δy_{t-1}	0.927	0.187	4.95	0.000	***
Δy_{t-2}	0.931	0.251	3.70	0.000	***
Mean dependent var	-0.064		SD dependent var		0.449
Number of obs.	24.000		Akaike crit. (AIC)		

Note: *** p<0.01, ** p<0.05, * p<0.1.

The VECM estimation results in Table 5 show the signs of the estimated coefficients of the lending rate (R) are negative. This finding suggests any increase in the lending rate over the short-run will cause a decrease in demand for bank credit. The results also show that estimated coefficients of income (y) are positive, and statistically significant (Table 5). This finding, which rejects the null hypothesis, suggests that an increase in national income increase demand for credit by the private sector. Moreover, the results in Table 5 show the coefficient of the one-period lagged inflation is negative and statistically significant at 5 percent test levels; and that on the two-period lagged inflation is positive and statistically insignificant. The negative sign on the one-period lagged inflation rate is unexpected, that is, it rejects the null hypothesis.

In contrast, the positive but statistically insignificant coefficient of the two-period lagged inflation rate may appear theoretically implausible, and thus unexpected. In conventional theory, a rise in price level should cause substitution of money for goods; and an increase in expenditure that decrease saving, among others, in money and other financial assets. However, beyond that conventional view, the positive sign on the coefficient on inflation may result from indirect effect of inflation on demand for private sector demand for credit occasioned by an increase in households demand for more loans due to decrease in the purchasing power of money caused by inflation. Not least, the estimated coefficient of the one-period lagged error term of the co-integrating equation is negative signed as expected; and is also statistically significant. Its size suggests about 24 percent of the adjustment of short-run shocks to equilibrium in demand for bank credit will be take one year. The adjustment is thus low, seemingly because of the nascent financial sector in Tanzania.

4. Conclusion

The purpose of this study was to evaluate the macroeconomic determinants of bank credit in Tanzania during the period 1991 –2018. The macroeconomic variables of

interest included national income, lending rate, and inflation. The co-integration test revealed the existence of a long-run equilibrium amongst the variables of the estimation model. A vector error correction (VECM) was estimated; and the econometric results revealed the existence of statistically significant negative effect of lending rate on private sector demand for bank credit over the short-run; and in relation, income had a positive effect on demand for credit. The effect of inflation on private sector demand for credit over the short-run was inconclusive. Nonetheless, the results show that all the three explanatory variables influenced credit demand for the period under study. The VECM results also confirmed the variables of the estimation were indeed co-integrated. This finding also suggests there was causality between demand for credit and the three regressors of the estimation model, i.e., lending rate, inflation and income. The findings are in line with recent literature confirming that macroeconomic variables influence demand for bank credit. The findings have significant policy implications in that they call for policy makers to observe the behaviour of lending rates, inflation, and economic performance to enhance credit demand for increased investment and economic growth.

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