Determinants of Bank Credit Supply to the Private Sector in Tanzania

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Abstract

What determines bank credit supply to the private sector is an issue of policy and research interest in Tanzania and other countries. On the background of the financial sector reforms implemented in the country since the early 1990s, this study sought to establish empirically the most determinants of private bank credit in Tanzania over the period 1991:Q1 - 2019:Q4. ARDL bounds cointegration test method was used to establish both short and long run impact multipliers of the determinants of bank credit. The results revealed real bank credit was a superior regressand to alternative regressands; and, real short term lending rate was superior to the real overnight bank lending rate. Moreover, the study found bank deposits was unimportant determinant of bank credit; and, growth and inflation respectively had positive and negative effect on bank credit supply. The results also suggested real bank credit growth was cointegrated with its determinants over the long run.

Keywords: Bank credit supply; Private sector; Bounds cointegration test; Tanzania.
JEL Classification Codes: G21, E50.

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1. Introduction

What determines bank credit supply to the private sector has been a subject of interest in pedagogical and policy-oriented research, particularly so in developing countries. The drivers are two. One is recognition of the importance of bank credit supply in the process of economic growth and development (Levine *et al*., 2000). It is acknowledged in the economics literature that commercial banks were an important source of funds used to finance industrial revolution in Europe and America (Seidman, 1969). The other is the theoretical link between bank credit supply and monetary policy as per the so-called credit channel of monetary policy transmission (Romer & Romer, 1990; Imran & Nishat, 2013; Bernanke & Blinder, 1988; Blinder & Stiglitz, 1983). In a bank based financial system, like Tanzania, a loose and also too stringent domestic credit policy may adversely affect macroeconomic performance.[1] Accordingly, for an optimal policy option, knowledge is required on the determinants of the supply and demand of bank credit (Beck *et al*., 2004).

The purpose of this paper, first, is to analyse the evolution and determinants of bank credit to the private sector in Tanzania since the liberalization of the financial sector in 1991. In this engagement the analysis seeks to identify policy and policy determinants of bank credit supply. This is crucially important for policy in view of the importance of bank credit to economic growth and development, on the one hand; and, the interest rate and credit channels of monetary transmission mechanism (MTM), on the other (Sacerdoti, 2005; Kishan & Opiela, 2000). Second, the analysis is also motivated by dearth of empirical studies on determinants of bank credit supply in Tanzania. The previous study by (Kilindo, 2000) only focused on macroeconomic determinants of bank credit; a panel data study by Cihak and Podpiera (2005) was not specific to Tanzania; and, besides, it was not on bank credit supply but competition between domestic and foreign banks in Kenya, Tanzania and Uganda.

The rest of the paper is organized as follows. Section 2 motivates empirical analysis by dwelling on the evolution of bank credit supply to the private sector in Tanzania over the period 1991:Q1 - 2019:Q4. The relevant literature is covered in Section 3; and, Section 4 present the methodology of the study. Empirical results are presented in Section 5; and, Section 6 concludes.

2. Bank credit supply to the private sector in Tanzania

Since the attainment of political independence in 1961 the supply of bank credit in Tanzania has existed and is influenced by two types of macroeconomic management regimes: the command and market economy regimes. The command economy regime was founded on the Arusha Declaration promulgated in 1967 and its Ujamaa and Self Reliance Policy and remained in vogue over the period 1967-1986. Under that regime, bank credit supply to the private sector was chiefly availed by two state owned commercial banks: the National Bank of Commerce (NBC), which was established by the government after the nationalization of private banks in 1967; and, the Cooperative and Rural Development Bank (CRDB), which was formed out of the Tanzania Rural Development Bank (TRDB) in 1986 (Ndanshau, 1996).

The bank credit supply during the command economy regime remained directed, at fixed interest rates, and in favour of public enterprises operating in what the government designated as the key sector of the economy.[2] The Presidential Commission of Enquiry into the Monetary and Banking System in Tanzania, popularly known as Nyirabu Commission, among others, found over 90% of

the commercial bank credit was to large borrowers including public enterprises and the cooperative unions (URT, 1990). Accordingly, the Nyirabu Commission established small and inadequate loans characterized commercial banking lending to the private sector during the command economy period. As a result, the households and firms rationed in bank credit supply recoursed to informal (unorganized) financial markets and institutions, including money lenders, diverse types of Rotating Savings and Credit Societies (RoSCAs), Saving and Credit Association (SCA), landlords, friends, neighbours, and relatives (Hyuha, Ndanshau & Kipokola (1993).

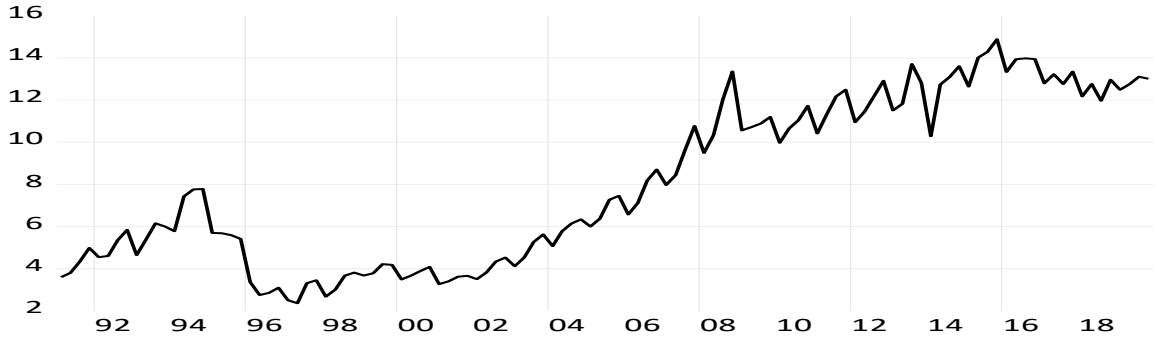

Figure 1: Private Sector Credit to GDP in Tanzania, 1991:Q1 – 2019:Q4 (%)

Source: Plotted from the basic data.

The quarter-to quarter bank credit to the private sector indeed increased commendably after the liberalization of the financial sector in June 1991 (Figure 1). Suffice it to note however, that the credit to private sector decreased to a low in the first quarters of 1996 due to, among others, credit squeeze effected by the Bank of Tanzania following designation of price stability as its prime objective of monetary policy in Tanzania (URT, 1995). The credit squeeze by the Bank of Tanzania (BoT) engendered: a) use of prudent monetary policy that led to credit squeeze, especially to the state owned enterprises (SoEs), elsewhere referred to as parastatals, and the cooperative unions; b) privatization of the SoEs since 1993 that historically received preferential treatment in the supply of "cheap credit" supplied by the state owned banks; c) prudent management, recapitalization and finally privatization of the gigantic state owned commercial bank, namely the National Bank of Commerce (NBC).

Figure 1 shows bank credit supply has generally risen since 1996:II to an unprecedented high rate (about 13%) in 2008:I as the real GDP growth remained constant but fell in 2009. Accordingly, Table 2 shows the quarterly mean and median credit rates also respectively rose from the low of about 3.1% and about 3.5% in the 1996QIII-2001:II period to the high of about 14.9% and about 12.8% in 2011:QIII-2016:QIV period. Both statistics for bank credit to the private sector in Tanzania during the same period compares unfavourably with that for other non-oil Sub-Sahara African (SSA) countries (Iossifov & Khamis, 2009; IMF, 2006). In the case of Tanzania, however, the magnitude of the rise in bank credit to private sector was like a "boom".[3] While entry of new private and public banks and other financial intermediaries after the liberalization of the financial sector in 1991 could explain the development of that "boom", it also owes explanation from government lift of restrictions of bank lending to the private sector in 1997 and also "intervention

bythe Government to rescue the private sector from effect ofs of the GFC (Global Financial Crisis)" in 2008 (URT, 2012, p. 16).

Noteworthy, the private sector credit to the GDP ratio fell to a low (10%) in 2010:I, seemingly due to global financial crisis (GFC) that afflicted most other SSA countries over the period 2008 - 2012 (Katusiime, 2018; Aisen & Franken, 2020). Nonetheless, bank credit supply rose to yet another unprecedented peak (about 14%) in 2013:III. Noteworthy, between 2013:III and 2015:IV the ratio of bank credit to the GDP exhibited a trough: it fell to a low (about 10%) in 2014:III and rose to a peak (about 15%) in 2015:IV. Thereafter, it fell to a low (12%) in 2018:III but then rose to 13% in 2019:IV.

Table 2: Average Rates of Private Credit and Other Macroeconomic Variables (%), 1991Q1 – 2020Q2

Variable		1991:Q3-1996:Q2	1996:Q3-2001:Q2	2001:Q3 – 2006:Q2	2006:Q3 - 2011:Q2	2011:Q3-2016:Q2	2016:Q3 2019:Q4
Credit to GDP Ratio	Median	5.40	3.47	5.45	10.61	12.77	12.78
	Range	2.75-7.78	2.36-4.21	3.51-7.46	7.97-13.36	10.29-14.89	11.97-13.98
Real Credit Growth	Median	0.545	3.274	6.488	4.21	2.959	-0.46
	Range	-28.46-0.71	-14.54-6.38	-1.36-14.70	-14.98-14.39	-13.48-20.27	-5.62-7.87
Credit to Depo. rate	Median	37.48	34.70	36.33	68.15	63.98	73.79
	Range	19.72-51.51	17.84-37.52	27.21-45.94	48.24-72.70	60.85-78.45	65.51-79.54
Growth–Real Depo.	Median	1.05	2.83	3.86	3.11	1.16	0.90
	Range	-19.21-11.95	-11.36-10.60	-0.25-22.85	-5.23-6.60	-5.05-6.44	-7.74-11.00
Economic growth	Median	-2.43	1.58	0.50	-0.82	-0.81	-0.28
	Range	-16.08-18.99	-3.73-22.01	-1.25-13.91	-7.40-14.41	-4.45-11.91	-1.98-6.42
Inflation	Median	5.96	1.47	0.18	1.67	1.77	0.58
	Range	-2.95-16.08	-3.64-12.73	-3.78-7.89	-0.33-7.40	-0.22-5.71	-0.80-2.74
Real lend rate	Median	22.14	20.66	15.53	12.70	12.11	15.38
	Range	16.06-34.84	10.51-39.74	6.91-19.46	7.54-15.35	8.21-15.02	11.66-18.93
Real_over. rate	Median	na	-1.86	-0.02	-1.55	-1.41	-1.77
	Range	na	-8.46	-7.18-3.89	-8.13-3.95	-14.98-7.56	-6.54-2.04
Real_TB91 rate	Median	-6.17	-1.05	0.33	-1.55	-1.96	-1.33
	Range	-47.09-2.18	-18.40-7.92	-10.18-3.91	-9.48-1.98	-5.79-2.32	-3.98-1.02

Sources: Calculated from the data set used.

3. Literature review

In theory bank credit supply to the private sector is determined by a set of factors internal and external to bank (Barajas *et al.*, 2010; Amidu, 2014). The internal determinants include, among others, availability of reserves (funds), bank size, capitalization, access to long term funds, legal powers to enforce debt contracts, borrowers' information (Djankov *et al*., 2005; Guo and Stepanyan, 2011; Cecchetti, 1999). As maintained, larger banks have high potentials for lending because: they "are more diversified, have larger pools of funds available, have access to larger and more creditworthy corporate borrowers, and have more resources for the development of advanced credit risk management and evaluation systems" (Constant and Ngomsi, 2012: 110. Also, see Berger and Udell, 2006; Uchida *et al.*, 2007). To advance credit it, *ceteris paribus*, requires a good lending capacity, from deposits mobilized and other sources of reserves (Misra, 2019; Constant and Ngomsi, 2012).

The non-bank-based determinants of bank credit supply include stance of monetary policy, financial structure, institutional, internal and external shocks (Baum *et al*., 2009; Jappelli and Pagano, 2002; La Porta *et al*., 1997). In the context of traditional theory on the transmission mechanism of monetary policy bank credit supply is determined by the short term interest rate. Monetary policy action that cause a decrease (increase) in interest rate lead to expansion (reduction) in bank credit, and vice versa. In contrast, in the non-traditional theory credit channel increase (decrease) in interest rates decrease (increase) credit worthiness and consequently the access to bank credit by the private sector, particularly the small borrowers (Myers, 1977; Diamond & Rajan, 2002; Bernanke & Blinder, 1988).

Apart from the monetary policy effects, the bank credit supply to the private sector may, in theory, be affected by macroeconomic environment, among others, economic growth, inflation, enforceability of debt contracts, legal systems governing banks, economic and political risks, type of tax regime, etc. Specifically, economic growth strengthens "consumer confidence and business sensitivity, boosting consumption and investment and the need for their financing" (Iossifov and Khamis, 2009: 5. Also, see Hoffmann, 2004; Calza *et al*., 2001). On the supply side, economic growth also increase reserves from deposits that augment lending capacity and profitability of the banks. The latter, as a measure of return on equity (RoE) again trigger bank credit expansion.

Lago (2007) and McDonald and Schumacher (2007) also notes that banks would lend if debt contracts are enforceable, else they would either shirk from lending due to moral hazard, adverse selection and the associated high monitoring costs that engender loss of profit from unenforceable loan recovery or invest in low risk-low-return financial assets, for example, government papers (Nkusu, 2003). Thus, as maintained by Djankov *et al*. (2005), poorly functioning legal systems, might be unable to sustain an effective lending channel based on ex post creditor rights, and may depend on information sharing for their credit markets to function.

Empirical studies on developing countries carry evidence on diverse and sporadic determinants of bank credit supply to the private sector.[4] In Asia, panel data based studies by Sarath and Van Phan (2015) established deposits, liquidity and non-performing loans were the most important and theory consistent bank based (internal) determinants of bank credit supply. In addition, such studies found the government bond rate, economic growth and inflation were also theory consistent

external determinants of bank credit supply. Similarly, a panel data study by Sharma and Gounder (2012), which covered some Island countries in the Pacific found that the bank based factors, including deposit rate, assets, and size of the banks were important positive determinant of bank credit supply. In addition, the study found economic growth was a positive determinants of bank credit supply; and, both lending rate and inflation had negative effect on lending by the banks in the Pacific Island countries.

In SSA, a panel data study by Amidu (2014) found that financial strength was the only important determinants of bank credit supply by the 264 banks in 24 SSA countries; and, the important factors external to the banks included structure of the banking markets and regulatory measures, which restricted banking activities in the sample countries, which included Tanzania. Moreover, a panel study by Guo and Stepanyan (2011), which a panel of thirty-eight (38) emerging market economies (EMEs) in Africa (Egypt, Morocco, and South Africa), Asia, Europe, Middle East, and the Latin America and found credit supply by banks was mostly determined by external factors, domestic and foreign funding, economic growth, inflation, and loose global domestic monetary policies.

Moreover, a panel data study by Constant and Ngomsi (2012), which covered thirty-five (35) commercial banks in six countries of the CEMAC (Central African Economic and Monetary Policy), also found that the lending by banks over the long term was positively determined by internal factors that included size, capitalization and availability of long term liabilities, and external factor, namely economic growth.[5] Similarly, in a panel study of 43 SSA countries, Iossifov and Khamis (2009) also found the credit to the private sector was positively influenced by per capita income and negatively by the interest rate. Also, a study by Abuka and Egesa (2000) concluded that income was one of the important determinants of bank credit growth in the East African Community (EAC) countries, including Kenya, Tanzania and Uganda. Besides, study by Cihak and Podpiera (2005) found competition lack of adverse effect of foreign banks on business operations of domestic banks in Kenya, Tanzania and Uganda.

The cross-country empirical evidence on some determinants of bank credit supply is alluded to by some country specific studies in Asia, SSA and the Latin America countries. In Asia, study on Pakistan by Imran and Nishat (2013) found that the supply of bank credit to businesses over the long run was determined by foreign liabilities, domestic deposits, economic growth, exchange rate and monetary conditions. According to the study, bank credit was not determined by domestic deposits over the short run. According to Imran and Nishat (2013) the estimated model was stable and with high speed of adjustment of short run shocks to long run stability. Furthermore, a panel data study on MENA (Middle Eastern and Africa countries (MENA) by Barajas *et al*. (2010) found bank credit in the African countries (Djibout, Egypt, Libya, Morocco, Sudan, and Tunisia) was determined by factors internal and external to the banks that included bank deposits, capitalization, loan quality; and, the external factors were economic growth, external borrowing, and status of monetary policy. Also Kechick (2008) established existence of a positive effect of inflation on private sector demand for credit in Malaysia.

In Sub-Saharan Africa (SSA), several country specific studies have established diverse internal and external determinants that bear influence on bank credit supply to the private sector. In Ghana, study by Adekele and Awodumi (2018) established the bank credit supply over the long run period

was positively determined by exchange rate, net foreign liabilities, and real GDP. Over the short run, Adekele and Awodumi (2018) found bank credit was negatively determined by external factors, including inflation, money supply, net foreign liabilities, and reserve requirement. Study by Baoko *et al.* (2017), which is also on Ghana, found bank credit supply over the short and long run period was positively determined by bank deposits as an internal factor; and, factors external to the bank were broad money supply, real lending rate, and inflation. Unlike Adekele and Awodumi (2018), the study unexplainably found the effect of inflation on bank credit was positive over the short run. Moreover, a study on Ghana by Ladime, Sarpong-Kumankoma, & Osei (2013) also found bank lending was positively and significantly determined by both factors internal and external to the banks, including bank size, capital structure, the central bank lending rate, exchange rate. Furthermore, Amidu (2006) established credit supply by banks in Ghana was determined by bank-based factors that included size and liquidity; and external factors, which included money supply and economic activities and negatively affected by central bank's prime rate and lending rate. The study also found bank-based factors, the bank size and liquidity, also impacted positively on the supply of credit by the banks.

In a study on Uganda, Katusiime (2018) also found bank credit supply was determined by some external factors, including inflation and its volatility, the nominal exchange rate and credit demand inertia (one-period lagged bank credit). Among others, the study found impotency of interest rates and economic growth in explaining bank credit supply in Uganda at least during the sample period. In Ethiopia, study by Assefa (2014) found bank credit supply over the long run was positively determined by a bank-based factor w,hich is deposits; and, external factors, which included real lending rate, inflation and credit demand inertia (one-period lagged credit). Over the short run, the study found bank credit was only determined by an external factor, namely, money supply but not deposits, which is a bank specific factor.

In sum, the literature survey reveals existence of several important determinants of bank credit supply in developing countries which, for the sake of convenience in the impending analysis, are clustered here into three categories: a) bank based (internal) factors, including size, capitalization, liquidity, volume of deposits, and non-performing loans; and, among others ; b) policy factors, including discount rate, the statutory minimum reserve ratio, and the real lending rate; c) macroeconomic (external) factors that include inflation, economic growth, public sector credit, exchange rate, regulatory and legal framework for debt enforcement, sophistry of financial system, national politics, culture (Rajan and Zingales, 2003; Garretsen *et al*., 2004; Djankov *et al*., 2005); and, d) internal and external shocks.

Noteworthy, the regressand used in previous studies differs across studies: they include credit to GDP ratio, credit to total assets ratio, loans and advances to total assets ratio, level of bank credit, and growth of real bank credit. The diversity of regressands and regressors make results informing but not comparable within and across countries. The incomparability of the results is complicated by the diversity that characterizes the methods of data analysis put to use. They include error correction model (ECM), Generalized Method of Moments (GMM), Two Stage Least Squares (2SLS) and autoregressive distributed lag (ARDL) bounds test method.

The diversity of models and estimation methods, let alone the sample size and data type, differs notably. The analysis here is based on quarterly time series data fitted by using ARDL model.

Implicit, the results from this specific study on Tanzania serve to add into the literature on the supply-side studies on determinants of bank credit in developing market economies.

4. Methodology

4.1 The Estimation Model

The investigation into the determinants of bank credit supply to the private sector in Tanzania is based on a model that reads as:

$$bc_t = f(X_{i-t}, Y_{j-t}, Z_{k-t}, D_1, D_2) \quad (1)$$

where bc_t is bank credit to the private sector measured either as a ratio of the GDP (cr) or in its real growth rate (cg). Given the literature review, bc is determined by policy variables (X_i:i=1,2,….N), bank based factors ($Y_j: j = 1,2, \dots M$), macroeconomic fundamentals (Z_h:h=1,2,…,h), monetary policy shocks (D_1), and the global financial shock (D_2) over the sample period (T).

Given the literature survey, the available data and macroeconomic fundamentals in Tanzania, the elements of X_i are two: real short-term lending rate (r_L) and real over-night inter-bank lending rate (r_{ov}). Both are measured by their respective values net of one-period lagged inflation rate, which is commonly used as a proxy for expected inflation. The effect of either rate on bank credit supply is indeterminate.[6] Even though, high cost of lending, *ceteris paribus*, may have a positive effect on bank credit supply if borrowers "are willing to and able to pay more premium", which is an additional cost over the lending rate (Ladime *et al*., 2013: 44). Bank size (bs) is the only bank-based factor in (Y_j) which was measured by real growth rate of total domestic deposits of the commercial banks including, saving, demand, and time deposits.[7] In fact, according to Mbowe (2015) private deposits dominates banks' funding in Tanzania: they over two-thirds over the period 2001-2012. Accordingly, the bank size is expected to have a positive effect on bank credit supply.

The set of macroeconomic variables (Z_K) is constituted of inflation (π) and real rate of economic growth (g). Inflation, which is expected to have a negative effect on bank credit supply, is measured as the first difference of the natural logarithm of consumer price index (CPI) in Tanzania.[8] The CPI was also used to deflate the nominal variables. Economic growth is measured as the first difference of the natural logarithm of real GDP; and, its effect on bank credit supply is expected to be positive. A negative effect on bank credit supply is expected from the global financial crisis (D_1) over the period 2007: I – 2008: IV and shifts in monetary policy regime (D_2) during the sample period. Either shift variable was assigned a unit for event and zero otherwise. effect on bank credit supply.

4.2 Data type and sources

The analysis is based on quarterly time series data for the period 1991:Q1 - 2019:Q4. The data in level, which were transformed by natural logarithm, were obtained from two main sources: a) the annual and quarterly reports of the Bank of Tanzania (BoT); and, b) the National Bureau of Statistics (NBS) in Tanzania. EViews (Version 10) was used to estimate the models and also carry out the relevant diagnostic tests. Noteworthy, the measures of variables used in the analysis: a)

serve to capture better the macroeconomic environment in Tanzania during the sample period; b) aim to build a body of knowledge on the subject matter; and, c) target to provide a basis for comparing results with that obtained by previous studies on developing countries and beyond.

Table 2: Descriptive Statistics, 1991:Q1 – 2019:IV

Variable	Mean	Med.	Max.	Min.	Std. Dev.	Skew.	Kurtosis	Jarque-Bera	Obs.
cr	8.07	7.35	14.89	2.36	3.92	0.16	1.46	12.01***	116
cg	2.48	2.88	36.38	-28.46	9.22	-0.38	5.58	34.92***	116
r_L	16.70	15.36	39.74	6.91	6.37	1.33	4.88	51.26***	116
r_{OV}	-1.71	-1.44	7.56	-14.98	3.72	-0.65	3.87	8.44**	83
r_{TB}	-2.78	-1.61	32.18	-47.09	6.89	-1.42	21.52	1696.17***	116
gd	2.03	2.35	22.85	-19.21	5.13	-0.22	6.75	69.11***	116
bs	15.34	15.39	17.41	12.68	1.44	-0.18	1.80	7.55***	116
g	1.77	-0.24	22.01	-16.08	6.59	0.91	3.92	19.93***	116
π	2.62	1.61	16.08	-3.78	3.69	1.08	4.17	29.05***	116

Table 3: Correlation Matrix of the Variables of the Estimation Model, 1991:Q1 – 2019:Q4

Variable	cr	cg	r_{ov}	r_{TB_91}	r_L	gd	bs	g	π
cr	1.00								
cg	-0.15	1.00							
r_{ov}	-0.02	-0.02	1.00						
i_{TB_91}	0.04	-0.04	0.66	1.00					
r_L	-0.31	-0.07	0.46	0.58	1.00				
gd	-0.28	0.38	0.12	0.10	0.21	1.00			
bs	0.92	-0.24	-0.04	0.02	-0.23	-0.27	1.00		
g	-0.22	-0.29	-0.05	0.01	0.13	-0.28	-0.13	1.00	
π	0.04	-0.54	0.01	0.06	-0.09	-0.49	0.03	0.47	1.00

Table 2 reveal: the median credit ratio (cr) is smaller than its mean; and, its quarter-to-quarter supply ranged from 2.36 to about 14.89%.[9] Table 1 also show the quarter-to-quarter median real lending rate (r_L) is 2.51%. Also notable, the quarter-to-quarter median real rates of economic growth (g) and inflation (π) are about -0.24% and 1.61%, respectively.

Notable, the statistics in Table 2 reveal the variables were marginally skewed and mostly to the left for having the median values larger than the mean values. Nonetheless, all the variables have significant kurtosis, more notably the real 91-day treasury bill rate, mainly due its characterisation by some outlier rates caused by high inflation rates in mid-1990s. In general, the descriptive statistics in Table 2 suggests most variables of the estimation model were not normally distributed.

The correlation coefficients in Table 3 suggest existence of negative relationship between the bank credit ratio (cr), over-night (r_{Ov}), short-term real lending rates (r_L), growth of bank deposits (gd),

and economic growth (g). A positive correlation is notable between the bank credit ratio, bank size (bs) and both real treasury bills rate (r_{TB}) and inflation (π). Notable, the correlation between the bank size and the credit ratio is very high (0.92)! Moreover, the growth rate of bank credit ratio is negatively correlated with all proxy measures of monetary policy (over-night interbank rate, and both lending and treasury bills rates). The results also reveal that the bank credit growth rate is negatively correlated with bank size, economic growth, and inflation. Only growth in bank deposits is positively correlated with the growth in bank credit. Among others, the negative correlation between real economic growth and both credit ratio and bank credit growth are inconsistent with theory. This inconsistency could be an outcome anti-inflationary monetary policy action of the central bank since the 1990s.

4.3 Estimation methods

The long-run relationship between the variables in equation (1) is investigated by using (bounds) Autoregressive Distributed Lag (ARDL) cointegration technique. The technique was preferred for two main reasons, aside many others.[10] One, it attends to potential simultaneity problem in theories and some growth regressions with variables in equation (1), among others, inflation and economic growth; and, also financial sector development and economic growth. On the latter, for example, Romer and Romer (1990: 155) specifically notes that "movement in lending are largely determined by movements in output". Second, the method is credited for being parsimonious in data: is good for small sample data points (Pesaran and Shin, 1999; Pesaran, Shin and Smith, 2001).

The estimated conditional ECM model reads as:

$$\Delta cr_t = \alpha_0 + \alpha_1 cr_{t-1} + \alpha_2 X_{t-1} + \alpha_3 Y_{t-1} + \alpha_4 Z_{t-1} + \sum_{i=0}^{k} \beta_i cr_{t-i} + \sum_{i=0}^{k} \beta_i \Delta X_{t-i} + \sum_{i=0}^{k} \vartheta_i \Delta Y_{t-i} + \sum_{i=0}^{k} \gamma_i \Delta Z_j + \emptyset_1 \mathrm{D}_2 + \emptyset_2 \mathrm{D}_2 + u_t \quad (2)$$

where all the variables are as already defined, Δ is a difference operator, the β_i, ϑ_i, and γ_i are short-run impact multipliers; the α_i $(i = 1,2,3)$ are long-run impact multipliers, k is lag length of the regressors that may differ from one regressor to the another, and the u_t is a well-behaved stochastic error term.

Equation (2) was used to test the null hypothesis that bank credit supply was not cointegrated with its determinants, that is, $\alpha_i = 0$, else $\alpha_i \neq 0$, which is the alternative hypothesis. Notable, in the bounds cointegration test the null hypothesis is rejected if the restricted F-statistics estimated in (2) are above the upper bound critical value given by Pesaran (2001); and, is otherwise accepted if the estimated value of F-statistics is below the lower bound critical value. Else, inconclusive results on cointegration test is implied by an estimated value of F-statistic that lies between the given upper and lower bound values.

Establishment of cointegration of the variables of the estimation model serve estimation of a conditional long-run ARDL model that reads as:

$$cg_t = \emptyset + \sum_{i=0}^{k} \varphi_i cg_{t-i} + \sum_{i=0}^{k} \omega_i X_{t-i} + \sum_{i=0}^{k} \theta_i Y_{t-i} + \sum_{i=0}^{k} \delta_i Z_j + \gamma_1 D_1 + \gamma_2 D_2 + e_t \quad (3)$$

Granted, to complement the long run results, short run dynamics in (1) was investigated by estimating an unrestricted Error Correction Model (ECM) that reads as:

$$\Delta cg_t = \emptyset + \sum_{i=1}^{k} \varphi_i cg_{t-i} + \sum_{i=1}^{k} \alpha_i \Delta X_{t-i} + \sum_{i=0}^{m} \beta_i \Delta Y_{t-i} + \sum_{i=0}^{n} \vartheta_i \Delta Z_{t-i} + \gamma ec_{t-1} + \varepsilon_t \quad (4)$$

where φ_i, α_i, β_i, and ϑ_i are short-run impact multipliers, the k, m, n, p are lag lengths; $ec_{t-1}$is a one-period lagged error term from the cointegrating equation; γ is coefficient of adjustment from short run disequilibria to long run equilibrium; and ε_t is a well behaved stochastic error term. In theory the γ should be negative signed and statistically significant.

The models estimated were subjected to a battery of tests. The data (in natural logarithm) were subjected to descriptive analysis; the estimation model was investigated for specification error and heteroskedasticity. Stability of parameter estimates was explored by cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares (CUSUMQ) tests.

5. Estimation results and discussion

5.1 Unit Root Test

Though is not a prerequisite in ARDL cointegration tests, ADF (Augmented Dickey-Fuller) technique to test the null hypothesis that the regressors were integrated of order zero, that is, I(0), against an alternative hypothesis that they were I(1).

Table 4: ADF Unit Root Test Results

Variables	ADF Test (with Intercept)		ADF Test (with Intercept and Trend)	
	Level	First Diff.	Level	First Diff.
cr	-0.68	-3.56***	-2.52	-3.57***
cg	-4.67***	-	-4.67***	-
r_L	-1.21	-15.97***	-2.56	-15.90***
r_{OV}	-9.44***	-	-9.40***	-
r_{TB}	-3.90***		-5.203***	
dg	-4.00***	-	-3.99**	-
bs	-1.08	-11.54***	-3.55**	-11.52***
g	-2.95	-9.90*	-2.73	-9.99*
π	-2.45	-12.77*	-2.45	-12.81*

Note: The asterisks, ***, ** and *, respectively, stands for critical values at 1%, 5%, and 10% levels of statistical significance.

The ADF results in Table 4 reject the null hypothesis for four variables: growth rate of real bank credit (cg), real overnight rate (r_{OV}), real treasury bill (91 day) rate (r_{TB}), and the rate of real deposits growth (dg). The alternative hypothesis is accepted in favour of the remaining variables,; and, no variables is I(2).

5.2 Co-integration Test

A priori, the optimal lag length for the ARDL model in (2) was investigated by using AIC, SIC and H-QC. Owing to the use of quarterly data the initial lag length of the unrestricted ECM estimated was set at eight equivalent to a maximum of two lags recommended for annual time series data considered more appropriate for estimation (Pesaran and Shin, 1999; Narayan, 2004).

Table 5: Choice of Lag Lengths of the Estimation Models

(a) Model of Credit to GDP Ratio: $cr = f(cr, r_L, dg, r_{ov}, g, \pi)$, ARDL (4,4,4,3,2)

Lag length	AIC	SIC	H_QC	se	R^2	F-stat.
0	1.93	2.15	2.02	0.61	0.55	16.31
1	1.87	2.22	2.00*	0.58	0.62	11.73
2	1.82	2.30	2.02	0.56	0.66	10.05
3	1.81	2.40	2.05	0.54	0.70	8.76
4	1.80*	2.51	2.09	0.53*	0.73	7.84
5	1.84	2.67	2.18	0.54	0.74	6.69
6	1.92	2.87	2.31	0.55	0.74	5.52
7	1.88	2.94	2.31	0.54	0.77	5.44
8	1.93	3.12	2.41	0.55	0.78	4.74

(b) Model of Credit Growth : $cg = f(cg, r_L, dg, r_{ov}, g, \pi)$, ARDL (6,7,7,7,3,3)

Lag length	AIC	SIC	H_QC	se	R^2	F-stat.
0	7.14	7.34	7.22	8.34	0.59	22.55
1	6.89	7.20*	7.01	7.19	0.71	21.24
2	6.78	7.21	6.96*	6.70	0.76	18.51*
3	6.74*	7.29	7.00	6.47*	0.79	15.87
4	6.79	7.43	7.05	6.52	0.80	13.32
5	6.84	7.62	7.15	6.57	0.81	10.81
6	6.81	7.71	7.17	6.40	0.83	10.12
7	6.76	7.79	7.18	6.20	0.85	9.72
8	6.80	7.93	7.26	6.25	0.86	8.64

Note: * The most optimal lag structure per each criteria.

The AIC, SIC, and H-QC results suggests different optimal lags for the estimation of the preferred models (Table 5). Nonetheless, first, the choice of optimal lag length was based on AIC and the standard error (s.e) of estimation because they appear logically consistent. Second, pre-tests based on systematic elimination of insignificant lag below and the optimal lag suggested by the AIC and the standard error of estimation (s.e) improved the explanatory power of the estimated model which respectively are ARDL (4,4,4,3,2) and ARDL (6,7,7,3,3).

Table 6 present F-statistics obtained by the ARDL (4,4,4,3,2) and ARDL (6,7,7,3,3) of normalized equations that were respectively estimated for the ratio of bank credit to the GDP and real growth rate of bank credit. The results in Table 5 show that all, except one of the estimated F- statistics for Model 1 in Table 6, are larger than the 10% upper bound critical values. Similarly, the results show all, except two of the F-statistics estimated for normalized equations for credit growth model, are above the critical F-statistics. However, the hypothesis of cointegration is rejected for bank credit to GDP model whose F-statisics (1.97) which is statistically insignificant and below the lower bound values at 10 per cent test level. In contrast, the F-statistics (5.87) estimated for the bank credit growth model is statistically significant and above the upper bound critical value at 1% test level. Accordingly, the hypothesis of no cointegration ($\alpha_i = 0$,) is accepted for the bank credit to GDP ratio model and accepted for bank credit growth model. Accordingly, real bank

growth model was preferred and used in the analysis hereafter because its results may not be spurious and meaningless but robust and useful for policy inference.

Table 6: Estimated F-Statistics by ARDL Cointegration Test

Model 1: Bank credit to GDP Ratio

Implicit Equations	F-statistics	Status
$cr\|\,\mathrm{cr}, r_L, dg, g, \pi,$	1.97	Not cointegrated
$dg\|cr, r_L, dg, g, \pi$	2.45**	Cointegrated
$g\|cr, r_{L,}\, dg, g, \pi,$	4.26***	Cointegrated
$r_L\,\|cr, r_L\, dg, g, \pi,$	2.82**	Cointegrated
$\pi\|r_L, \pi, cr, dg, \mathrm{g}$	2.17*	Cointegrated

Model 2: Bank credit growth

Implicit Equations	F-statistics	Status
$cg\|\,\mathrm{cg}, r_L, dg, g, \pi,$	5.87***	Cointegrated
$dg\|cg, r_L, dg, g, \pi$	1.46	Not cointegrated
$g\|cg, r_{L,}\, dg, g, \pi,$	2.78**	Cointegrated
$r_L\,\|cg, r_L\, dg, g, \pi,$	2.40***	Cointegrated
$\pi\|cg, r_L, \pi, dg, \mathrm{g}$	0.91	Not cointegrated

Critical values

Bound	1%	5%	10%
Lower bound, I(0)	3.233	2.476	2.129
Upper bound, I(1)	4.760	3.746	3.289

Note: (i) The asterisks, ***, ** and *, respectively, stands for critical values at 1%, 5%, and 10% levels of statistical significance.

(ii) Critical values are from Narayan (2005) for k=4 (with a constant and trend) and over 80 observations.

5.3 Long and Short run Imact Multipliers

Estimation of the long and short multipliers by the conditional ECM with optimal lag lengths excluded the two dummy variables (D_1 and D_2) proven "irrelevant" in pre-test estimations.[11] The pre-tests also established the growth rate of money supply and the 91-treasury bills rate were poor proxies for monetary policy. In this regard, *ceteris paribus*, real short-term and overnight bank lending rates are the preferred proxies of monetary policy used in the analysis.

a. Long run Impact Multipliers

The estimated results in Table 7 reveals the estimated elasticity of the real short-term lending and the overnight bank lending rate with respect to the bank credit to the GDP ratio over the long run period are negative and statistically insignificant at the conventional test levels.[12] It is noteworthy that, even though both elasticities are statistically insignificant, the negative sign is consistent with theory: a contractionary (expansionary) monetary policy would reduce (increase) credit supply to the private sector. However, the size of both elasticities suggests the responsiveness of bank credit supply to the short term and overnight lending rates is very inelastic, in fact less than 0.5! Accordingly, the estimated interest rate elasticities suggest both short term and overnight lending are poor intermediate targets of monetary policy over the long run seemingly due under development of its supportive institutional and macroeconomic environment in Tanzania.

Noteworthy, the negative and insignificant short term and overnight lending interest rate elasticities obtained for Tanzania are inconsistent with, among others, the positive elasticity estimated by Khamis (2009) in a study which covered 43 developing countries. Nonetheless, the results are consistent with finding obtained for Uganda by Kahusian (2018), Amidu (2014) for SSA, Baoko *et al*. (2017) for Ghana, and Assefa (2014) in a study on Ethiopia. However, in a cross country study of SSA countries, Amidu (2014) found a negative effect of interest rate on bank credit over the long run.

Table 7: ARDL Long run Impact Multipliers

Variable	Model 1		Model II	
	Coefficient	t-Statistic	Coefficient	t-Statistic
Real short-term rate	-0.10	-0.57		
Real overnight rate			-0.25	-0.48
Growth of real deposits	1.15	2.69***	-1.30***	-4.04
Economic growth	0.11	0.14	0.64	1.06
Inflation	-0.28	-0.54	-1.11	-1.70

Note: The asterisks, ***, ** and *, respectively, stands for critical values at 1%, 5%, and 10% levels of statistical significance.

The results in Table 7 shows the long run elasticity of the real growth rate of total domestic deposits, which is the proxy for bank size, is positive and statistically significant at 1% in the model estimated with the real short term lending rate (Model I); and, it is negative and statistically significant at the 1% test level in the model estimated with the real overnight lending rate (Model II). The established significance of bank size in explaining bank credit growth in Tanzania over the long run is similar to that obtained by Amidu (2014) for SSA countries and its sub-regions, including EAC, Economic Community of West African States (ECOWAS), and Southern African Development Community (SADC); and, Sharma and Gounder (2012) in a study on Island countries in the Pacific Ocean. However, while Kwakye (2012) found growth of deposits was not an important determinant of bank credit supply in Ghana, Baoko *et al*. (2017) found was negative but with respect to the credit to GDP ratio.

The estimated coefficients of the real rate of economic growth are positive as expected but both are statistically insignificant at the conventional test levels. Noteworthy, however, the positive effect of economic growth on bank credit growth, on the one hand, differs with the negative effect obtained by Djankov, McLiesh and Shleifer (2005) in a cross-country study of 113 developing and developed economies. On the one hand, the result is consistent with positive effect of economic growth on bank credit established by, among others, Guo and Stepanyan (2011), Ibrahim (2009), Katusiime (2018), Sharma and Gounder (2012), Imran and Nishat (2013), Abuka and Egesa (2007), Amidu (2014), Thaker *et al*. (2016), and Azia *et al*. (2018).

The elasticity of inflation in both models is negative and statistically insignificant at the conventional test levels.[13] The finding is similar to that obtained by Amidu (2014) in the case of SSA countries, Chirwa and Mlachila (2004) in Malawi, Beck and Hesse (2006) in Uganda, and Sharma and Gounder (2012) in the study on Island countries in the Pacific Ocean. Notable also,

Djankov, McLiesh and Shleifer (2005) found the effect of inflation on bank credit was negative, especially in richer countries. Nonetheless, some studies found a positive effect of inflation on growth of bank credit supply to the private sector over the long run, for example, Kichicha (2008) in Malaysia, Imran (2011) in Pakistan, Guo and Stepanyan (2011) in some emerging economies, and Katussiime (2018) in a study on Uganda, and Akinlo and Oni (2015) in a study on Nigeria.

b. Short run Impact Multipliers

Table 8 present results of the restricted ECM, respectively with real short term lending rate (Model I) and real overnight bank lending rate (Model II). Specifically, the results show the short run elasticity of the two, three and four quarter lagged real short term lending rate are negative and, respectively, statistically significant at the 1, 5 and 10% test level, the latter two are positive signed. The estimated interest rate elasticities suggest the responsiveness of the short term lending rate is larger than that of the overnight lending rate, implying a larger impact of the former on the growth of bank credit supply to the private sector in Tanzania at least during the sample period.

The result in Table 8 shows only one period lagged growth in real deposits has the expected positive sign when real short-term lending rate is used as a policy variable (Model I). Besides, the results show none of the estimated interest rate elasticities of lending is statistically significant at the conventional test levels. Notable also all the real overnight lending interest rate elasticities bear the unexpected negative sign; and, that for two and their period lags are statistically significant at the 5% test level. Furthermore, the results show the one and two period lagged effects of real economic growth on bank credit growth over the short run are positive as expected and are, respectively, statistically significant at the 5% and 1% test levels. Also, the two and three period lagged effect of credit growth on bank credit growth are positive and statistically significant at the 5% test level when the real over-night lending rate is the policy variable. The finding that economic growth enhances growth of credit to private sector is consistent with that obtained by some of the previous studies, among others, Sharma and Gounder (2012) in a study on six island countries in the Pacific Ocean and Imran (2011) in Pakistan. The results, however, differ with that obtained by Akinlo and Oni (2015) in a study on Nigeria.

Moreover, the results show the contemporaneous and the three period lagged inflation rate have the expected negative signs but only the latter is statistically significant (at the 1% test level) when real short term lending rate is the policy rate (Model I). In contrast, all estimated inflation elasticities are negative signed as expected when overnight bank lending rate is the policy variable. However, the contemporaneous elasticity of inflation is statistically significant at the 10% test level. The results in Table 8 also shows the one and three period lagged effects of the lagged real bank credit on bank credit growth when short term lending rate is the policy variable is positive; and, it is negative when lagged by two period. Notable, however, none of the estimated elasticities is statistically significant at the conventional test levels. In contrast, all the estimated elasticities of lagged bank credit growth are negative signed and statistically significant at the 5% test level.

The estimated coefficients of the one-period lagged error correction terms are negative and unambiguously different from zero at the 1% test level (Table 8). Accordingly, following Banerjee, Dolado and Mestre (1998), the sign and significance level of both parameter estimates suggests growth of bank credit was cointegrated with its determinants; and, at least one way causality existed amongst them over long run period. The size of the coefficient of the one period lagged error correction term suggests the speed of adjustment from short run shocks to the long run

equilibrium was high: respectively, 85 and 67 per cent of the short-run shocks would be cleared within one quarter period. Notable, the adjustment to equilibrium over the long run is relatively lower in the model with the overnight real lending rate.

Table 8: Results of the Error Correction Models

		Credit growth: Model I		Credit growth: Model II	
Variable	Lag	Coefficient	t-stat.	Coefficient	t-stat.
Constant		-0.04	-0.07	0.17	0.32
Real short-term rate	(0)	0.37	0.82		
	(-1)	0.43	1.00		
	(-2)	-2.68	-6.14***		
	(-3)	0.66	1.89*		
	(-4)	0.73	2.74**		
	(-5)	-0.34	-1.46		
Real over-night rate	(-1)			-0.19	-0.86
	(2)			-0.25	-1.14
	(-3)			-0.43	-2.01*
	(-4)			-0.33	-1.92*
Real Growth of total deposits	(0)	-0.02	-0.11	-0.23	-1.56
	(-1)	0.28	1.22	-0.37	-2.26**
	(-2)	-0.23	-0.84	-0.31	-2.19**
	(-3)	-0.11	-0.38		
	(-4)	-0.45	-1.62		
	(-5)	-0.38	-1.54		
Economic growth	(0)	0.17	0.77	-0.02	-0.13
	(-1)	0.60	2.53**	0.14	0.70
	(-2)	0.90	3.70***	0.43	2.17**
	(-3)	0.35	1.58	0.37	2.07**
Inflation	(0)	-0.32	-0.87	-0.60	-1.94*
	(-1)	1.01	1.62	-0.33	-0.85
	(-2)	0.05	0.08	-0.23	-0.70
	(-3)	-2.98	-4.57***		
Real credit growth	(-1)	0.01	0.07	-0.42	-2.31**
	(-2)	-0.01	-0.06	-0.42	-2.74**
	(-3)	0.10	0.64	-0.21	-1.81**
Error correction term	(-1)	-0.85	-4.33***	-0.67	-3.42***
R-squared		0.81		0.75	
F-statistic		11.36***		9.10***	

Notes: The asterisks, ***, ** and *, respectively stands for critical values at 1%, 5%, and 10% levels of statistical significance.

The results also suggest the estimated error correction models were powerful. The estimated coefficients of determination (R^2) are high: both suggests the regressors, respectively, explained 81 and 75% of the growth in bank credit supply to the private sector in Tanzania during the sample period. Also, the estimated F-statistics, which are statistically significant at the 1% test level, suggests the model estimated with the real short-term lending rate as a policy variable is more powerful than that estimated with the over-night lending rate as a policy variable.

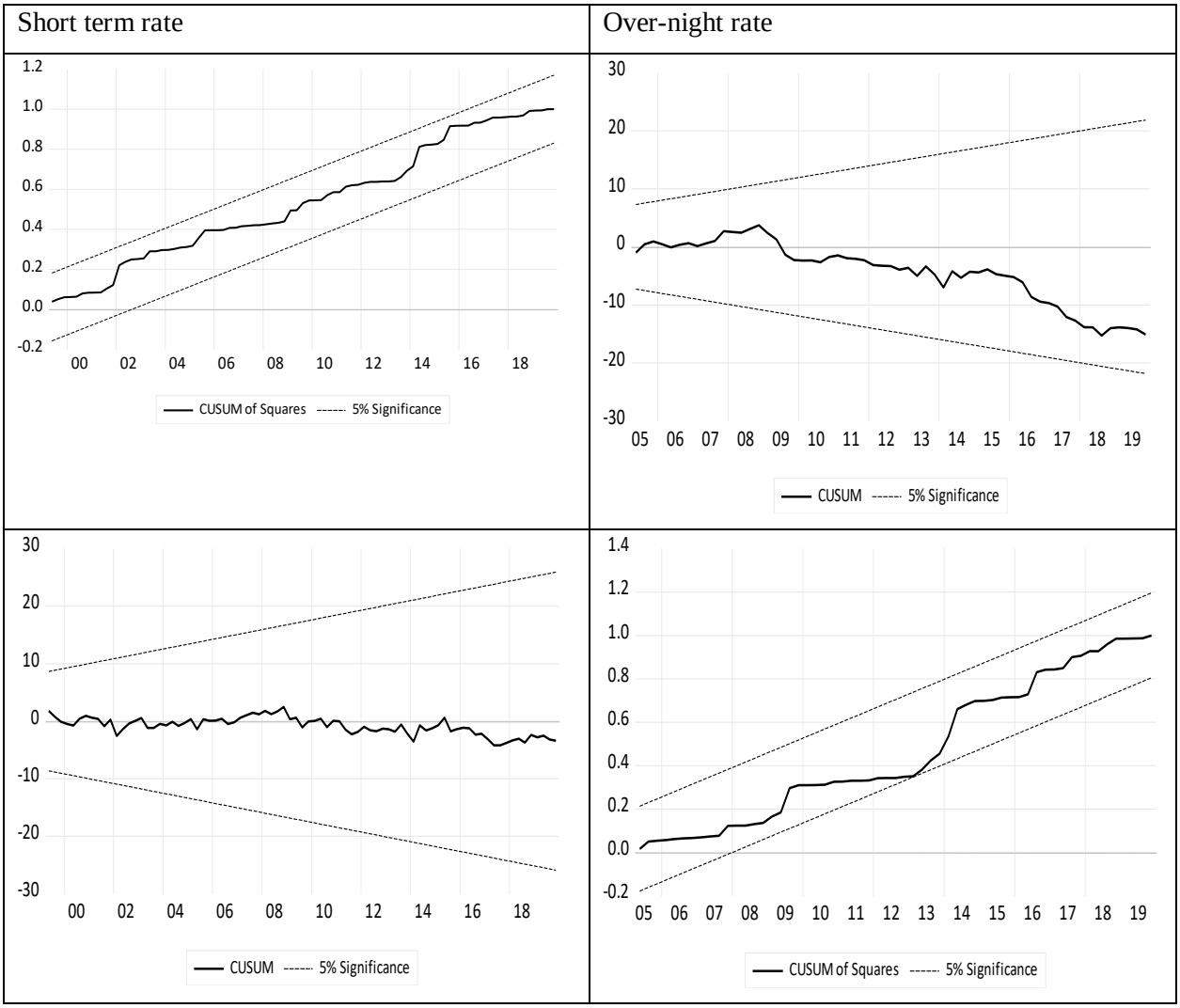

Figure 2: CUSUM and CUSUMSQ Stability Tests

Diagnostics test rejects existence of serial correlation, heteroscedasticity and wrong specification of the estimation models. Specifically, residual diagnostic test by the Breusch-Godfrey Serial Correlation LM Test reveal lack of serial correlation in the models estimated: the estimated F-statistics (Prob. F(31,83), p-value 0.75, and 1.89, Prob. F(2,57)=0.16) are statistically insignificant. Also, the Ramsey RESET tests results for the two model (t-stat. 0.97, F-stat. 0.94 (1, 82), Likelihood ratio 1.31 (0.25) and t-stat. 0.05, F-stat. 0.002, Likelihood ratio 0.003 (0.95)) are very statistically insignificant at the conventional test levels. The CUSUM and CUSUMSQ plots in

Figure 2 suggests both models estimated were very stable and confirm lack any structural break from the global financial crisis of 2008. Nonetheless the model with the real short term lending rate is more stable than that estimated with the real over-night lending rate.

6. Conclusion

This paper sought to investigate empirically the effect of policy, bank level and macroeconomic factors on bank credit supply to the private sector in Tanzania. The study used both bounds ARDL cointegration test and estimation of an ECM by using quarterly time series data for the period 1991:Q1 - 2019:Q4. *A priori* the estimation results the model for real bank credit growth was superior to that based on credit to the GDP ratio a regressor. Also, the model estimated with the real short term lending rate was superior than that estimated with real overnight bank lending rate of the commercial banks in Tanzania. More specifically, the results revealed existence of the expected negative relationship between bank credit growth and the real short term lending rate which was nonetheless not contemporaneous but generally very elastic. In addition, while bank deposit was a poor determinant of bank credit growth, economic growth exerted the expected positive effect on bank credit growth over the short run period. Inflation exerted the expected negative and statistically significant effect on real bank credit growth after three quarter period. The results also suggested lack of significant inertia in bank credit growth in the model estimated with short term lending rate but not in one estimated with the overnight bank lending rate. In the latter the parameter estimated were negative and statistically significant at the conventional test level.

The results bear three main policy implications. One, they suggest the short term lending rate rather than the overnight bank lending rate is the more important intermediate target of monetary policy in Tanzania, at least during the sample period. Second, insignificance of growth in bank deposits in explaining growth in the bank credit supply to the private sector demand for policy that would address excess liquidity in banks that undermines mobilization of financial savings in Tanzania. Third, the results point to the importance of macroeconomic stability and economic growth for increased lending to the private sector by the commercial banks in Tanzania. This calls for further research to better anchor the policy implications that flow from the findings of the study.

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[1] The banking sector accont for about 70% of the total assets of the financial system in Tanzania.
[2] According to Moshi (1994) the number of public enterprises rose from 27 in 1967 to 425 in 1984.
[3] According to Iossifov and Khamis (2009: 4) "Credit booms are defined as periods of extreme deviations of some measure of credit (i.e. log of real credit or the ratio of credit to GDP) from its trend, with the implicit assumption that such deviations are not supported by fundamentals".
[4] The review purposely exclude studies on developed economies which dominates the literature.
[5] The CEMAC (*Communauté Économique et Monétaire de l'Afrique Centrale*) was formed as a monetary block to promote economic integration amongst its six member countries, namely, Cameroon, Central African Republic, Chad, Republic of Congo, Equatorial Guinea and Gabon, who shares a common currency, namely the CFA franc.
[6] According to the literature the discount rate and statutory reserve ratio are other variables that could enter the estimation model. The discount rate was excluded because commercial banks in Tanzania are known to borrow more among themselves than through the discount window. Also, the statutory reserve ratio was excluded because it was not actively used as a monetary policy instrument over the period 1996 – 2014.
[7] The Non Performing Loans (NPLs), which constitute one of the determinants of bank credit in the literature, often are cited as one of the banks' hesitation to lend to the private sector in Tanzania (Abuka and Egesa, 2007). Nonetheless, the variable is excluded in the analysis mainly due to lack of adequate and reliable data.
[8] The NCPI was rebased in September 2010 from December 2001 (=100) by using 2007 HHBS (based on all types of household consumption in 21 geographical regions in Tanzania. Its weights were based on expenditure of both urban and rural households with groupings that followed internationally recommended classification of individual consumption by purpose (COICOP) which has 12 major groups. In groups in Tanzania included 4 other classification were included: a) food and non-alcoholic beverages; b) energy and fuels; c) all items less food; and d) all items less food and energy.
[9] According to Mbowe (2015) the annual average bank credit to the private sector over the period 2001-2012 was less than that was obtaining inmost SSA countries, among others, Kenya; and, large corporations dominates the banks' loan portfolio of which a third was in foreign currency.
[10] For a summary, among others, see Mtui and Ndanshau (2019), Baoko, Acheampong and Ibrahim (2017), and Imran and Nishat (2013).
[11] Incidentally, the exclusion of D_2 from the analysis is supported by an argument by Murinde (2010) that financial crisis lacked effect in economies with banks and stock markets not largely integrated in the global markets. It is also likely the crisis was aborted by BoT's "relatively easy monetary policy stance (adopted) as a countercyclical action" and establishment of a Department of Financial Sector Stability in 2009 whose main role was to monitor the financial system due regard being to provide preventive measures and policies to moderate the risk of financial instability in the country(Bank of Tanzania, 2011, 2010).
[12] In the context of Cecchetti (1999) banks in Tanzania are not very sensitive to policy induced changes in interest.

[13] 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 and Azim, 2006).