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Efficiency of Capital Adequacy Requirements in Reducing Risk-Taking Behavior of Tanzanian Commercial Banks

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Abstract
This paper intended to examine the relationship between capital and risk of Tanzanian commercial banks during the period 2009-2014 using the Two Stage Least Square (2SLS) method of estimation. The empirical findings reveal a direct relationship between capital ratios and bank risk-taking behavior implying that as the level of banks' risk increases bank managers tend to increase the bank capital ratios so as to prevent banks from violating the regulatory minimum capital requirements.The study also found a positive relationship between regulatory pressure and capital. This positive impact shows that Tanzanians large commercial banks approaching the minimum capital requirements are inclined to improve their capital base in order to circumvent the penalties resulted from infringing the legal requirements of keeping minimum capital ratio.The study further shows a positive and significant association between profitability and bank capital implying that that as the profitability of banks increases they retain more earnings to raise the level of their capital. Hence, it is concluded that improvement in profitability helps banks to increase their capital ratios and prevent them from penalty associated with failure to meet minimum capital requirements.
Key words: Bank Capital Adequacy, Risk-taking behavior, Regulatory Pressure, minimum capital requirements.

1. Introduction

Most studies focus on banks when considering the financial stability of the country because of a critical role banks play in providing financing services in economy as well as acting as the payment channel to businesses and economy at large, (George, 1994). On top of that, central banks use commercial banks and other financial institutions as a mechanism to transmit the changes in monetary policy to the real sector economy (George, 1994). Capital adequacy is considered as a stepping stone towards financial stability .Financial stability is said to be potentially disrupted by activities of non-banking activities when the relationship between banking activities and other parts of the financial sector is highly increasing as insisted by George, (1994).

In the modern banking regulation the minimum capital requirements play a very important role. The banking industry worldwide has witnessed implementation of the so-called Basle Accord that sets minimum capital standards for internationally active banks. During the 1970's and 1980's there existed several challenge posed by momentous declines in the banks' capital ratios resulted into bank insolvencies and ultimately failures. Following this, bank regulators have put their attention on the minimum bank capital requirements in order to boost the financial system stability. A crucial step in that direction was the 1988 Basel Capital Accord which was the agreement for banks among G-10 countries on minimum risk-based capital requirements of 8% to total assets. (BIS, Implementation of Basel II, 2004, *www.bis.org)*

Basel II came into existence in 2006 as a solution to weaknesses shown by Basel I and to further advance the regulatory capital requirements. The emergence of global down turn of 2007-2009 raised questions on the effectiveness of Basel I and II capital regulations because it is during the similar period of their introduction that banks suffered weak capitalization. It then followed Basel III was introduced in 2010 to rectify the shortcomings of Basel I and II.

The purpose of capital regulation is to make sure banks keep level of their capital proportional to their risk exposure profile. Nevertheless, if this matching of risk profile and capital level is not carefully designed the bank may be in a questionable financial soundness and ultimately failure. This may be a result of what is called moral hazard and asymmetry of information which gives rooms for bank managers to take excessive bank risks as previously advocated by Kahane (1977); Koehn and Santomero (1980);

In an attempt to reinforce the banking sector and extend the financial sector, as a whole, BOT set a relatively higher minimum regulatory capital ratio compared to the one stated in the Basel (I-III) which is 8% for total capital and tier-1 capital 4.5% and tier-2 capital 6%. Apparently, in Tanzania according to Banking and Financial Institutions Act (2014) a bank or any financial institution at any time has to maintain;

a) Core capital of not less than twelve and one half per cent of its total risk-weighted assets and off balance sheet exposure; and
b) Total capital of not less than fourteen and one half per cent of its total risk weighted assets and off balance sheet exposure

Together with all the efforts to restructure and rewrite banking regulations, in response to the recent

global financial crisis, there is quite a serious challenge in implementation of such regulations because each country's national policies are different and bank capital could have different effects on bank risk-taking. According to Ben Bouheni, (2013) this could be due to different financial and institutional environments in which the banks' operations are subjected. This has, therefore, attracted many scholars to consider this as a hot topic not.

The literature shows mixed results on the capital –risk nexus and that most studies are conducted on U.S. and European banks. For example González (2004), Klomp and Haan (2012), and Furlong and Keeley (1989) concentrated on U.S. banks and found a negative relationship between risk and capital while Rime (2001 focused on European banks and found a positive relationship. The literature also has covered some Asian banks; for example Klomp and Haan (2012) dealt with Japanese banks, Zhang et al. (2008) on Chinese banks Afzal and Laeven and Levine (2008), González (2004), Hussain and Hassan (2005) and results are still mixed . There are few studies from African banks and more specifically Tanzania on the relationship between risk-taking and capital. The intention of this study is to undertake an empirical analysis of Tanzania large commercial banks' risk taking behavior in its association with capital while observing the regulatory capital minimum requirements.

2. Related Literature

2.1 Theoretical Underpinnings

2.1.1 The capital buffer theory

During their operations, most banks maintain levels of capital ratios above what is set by the regulatory authorities as minimum capital requirement. In this case banks will always strive to increase their capital ratios when they come closer to the minimum regulatory capital ratio. According to Kjersti-Gro Lindquist, (2003) this excess capital is known as buffer capital which is the absolute difference between actual capital ratio and regulatory minimum capital requirement

The buffer theory manifested by Milne and Whalley (2002) envisages that due to a worry to incur costs associated with the violation of capital requirements bank approaching the regulatory minimum capital ratio may increase capital and reduce risk .In the Netherlands, currents banks' capital ratios have an average of a little more than 12%. Because this percentage is lying well above the minimum regulatory capital of 8 percent, an average Dutch bank also holds a capital buffer on top of the regulatory minimum.

According to Milne and Whalley (2002) several reasons are associated with banks holding excess capital; *first* the buffer as insurance, when a bank with poor capitalization becomes in situation of loosing public confidence and reputation this buffer may be used as insurance against cost of unexpected loan losses (due to purely random shocks or asymmetric information between the lender and the borrower) and that of raising new additional capital. On the other hand such banks may be encouraged to take more risk hoping to boost their reputations through expected higher expected rate of return otherwise shareholders may hesitate issue new capital to banks which may use the new capital to set creditors obligations hence the expected return may be their rescue in the eyes of capital providers., *second*, because having buffer capital is connected with the banks' assets risk profile the buffer capital in excess of the regulatory minimum robustly dictates bank's risk taking behavior On regulators, side banks with a relatively risky portfolio would prefer to hold a relatively high level of excess capital over minimum requirements than a lower level otherwise they are more likely record capital ratios below the minimum capital ratio; *third* as holding a buffer capital is considered by banks as the competition effect a bank may use excess capital to signify its financial health hence probability of nion-failure.Therefore buffer capital may be used as a mechanism of rescuing banks from failure due competition for unsecured deposits and money market funding. This is why most banks are very careful about the size of their own capital buffer relative to those of their competitors. According to Berger et al. (1995) banks may hold excess capital so as to be able to explore unexpected investment opportunities.

2.1.2. Moral Hazards Theory

Jokipii and Milne, (2008) acknowledge the regulation of the bank's capital as one of the crucial instruments of modern banking regulations. The regulation intends to create a cushion during economic down turns and a method to hold back banks from taking unwarranted risk. During an economic fall back, banks' asset quality falls resulting into capital fall. It should be clear that theoretical foundation on the relationship between capital and risk is mainly based on the theory of *moral hazard* that existed due to the emergence of agency problem. Jokipii and Milne, (2008) tested whether increased capital regulation encourages banks to increase their risks or the other way around.

3. Empirical Review

For quite sometimes now the research in banking sector has concentrated on the relationship that exist between the bank capital and their behaviors on risk taking. In this section the paper briefly reviews the literature surrounding this area. Regarding the effect of higher regulatory capital requirements on bank risk-taking behavior there is no conclusive results at the moment in the extant literature. For example, Koehn and Santomero

(1980) studied the interplay between higher capital regulation and banks' risk using variance model and found that that capital ratio regulation is ineffective in controlling banks' insolvency risk. They proposed the use of risk weights under the risk-based capital as a solution to the insolvency problem.

Furlong and Keeley (1989) undertook a theoretical examination of the impact of capital regulation bank risk taking behavior and found an inverse relationship implying that higher capital requirements reduces the bank managers' incentives to increase the risk of the bank assets .In essence high rigid capital regulation diminishes the liability of deposit insurance system until there is an effort in place to contain asset risk. The authors also found that higher capital requirement is only possible for those banks which maximize their values by raising more capital.

In a dynamic theoretical model, Blum (1999) assessed whether risk-based capital requirements reduce bank risk-taking and came up with a conclusion that higher capital requirements reduce risk only when it is a extremely expensive to raise capital. The author also shows that introduction of capital adequacy rules may not be an attractive good idea if the regulators are interested to decrease banks' insolvency risk.

A study by Calem and Rob (1999) on the impact of regulatory capital requirements on risk-taking behavior of banks revealed a U-shaped relationship between bank capital and risk-taking showing that when banks raise their capital levels they first take lower risk, and then higher risk. The study shows that undercapitalized banks take more risk due to extra deposit insurance premium. In their study, the authors found that as the capital requirement increases risk taken by well-capitalized banks also increases

Using Switzerland banks data Rime (2001) examined the impact of regulatory capital requirements on bank risk-taking behavior and results show that Swiss banks increased their capital due to regulatory pressure. They also report insignificant relationship between regulatory pressure and risk. This may mean that banks whose capital ratio falls below minimum capital requirements often wish to raise their capital adequacy ratio. The author concludes that changes in capital ratios and corresponding changes in risk are directly related and they also observed that bank size has significant inverse relationship with capital.

In analyzing relationship among capital requirements, market power and risk, Repullo (2002) utilized a dynamic model of imperfect competition and found that the franchise values of banks depend on the margin of intermediations; that is if the franchise value is small the margin is also small and vice versa. The author also reported that, in a competitive banking market, capital requirements are effective in limiting bank risk-taking

Using a sample of 36 countries comprised of 251 banks González (2004) examined the effect of bank regulation on bank risk-taking and charter values. The results of the study revealed a negative relationship between stability of banking system and regulatory restrictions that means stringent regulatory restrictions decrease bank charter values and encourage banks to take more risk. They also report that in countries with deposit insurance bank charter values are on higher side.

Another countrywide study by Hussain and Hassan (2005), using 11 developing countries, which examined the impact of capital requirements on credit risk-taking, found that capital requirement regulations don't have any impact on increasing bank capital ratios in developing countries. In developing countries factors which matter more in designing and implementing capital regulations include the environmental, cultural, business and legal issues.

Furthermore, using a sample of 200 banks from OECD, Klomp and Haan (2012) used 200 banks from OECD countries to analyse the impact of bank regulation on risk-taking behavior and the empirical evidence of the study show that bank supervision and regulation has strong impact on risk-taking decisions of high-risk banks but insignificant impact for banks with low risk profile.

A study by Zhang et al. (2008) on Chinese commercial banks analysed the impact of capital regulation on bank risk-taking using GMM dynamic estimator and found a significant inverse relation between capital change and risk change implying that increment in capital ratio was effective to limit commercial banks risk by putting in place adequacy regulation. They also concluded that bank size has a positive effect on changes in capital.

Laeven and Levine (2008) empirically studied the theories of bank ownership structures, bank industry regulations and bank risk taking. Particularly, they concentrated between owners- managers agency problem over bank risk-taking decisions. Their study found that major owner's control rights and bank risk-taking are positively related implying that bank risk-taking goes parallel with control rights of main shareholders. The findings also show that bank risk-taking is also dependent on banks' corporate governance structure.

4. Methodology

4.1 Data

The data used in this paper are collected from the respective banks' published quarterly financial reports for the period under study (2009-2014). Our sample includes all 8 large commercial banks operating in Tanzanian banking sector as categorized by EY (2015) based on their capital levels. These banks include Barclays, Citibank, CRDB, Exim, NBC, NMB, Stan Chart and Stanbic. Such banks dominate the financial services and control over

75% of the market shares as reported in survey done by Serengeti Advisors (2015).

4.2 Model Specification and Variable Definition

The paper primarily aims at examining the reaction of Tanzanian commercial banks to regulatory pressure of decision related to capital and risk. We apply simultaneous equation model, a version developed by Shrieves and Dahl (2003). Since the bank capital and risk are usually correlated (they are endogenous)and are explanatory variables to each other in their respective equations, we apply a two-stage least squares regression analysis (2SLS) assuming that banks make decisions related to capital and risk simultaneously. A central aspect of this methodology is that it recognizes that changes in both capital and risk have endogenous and exogenous components.

Before applying either OLS or 2SLS we test the endorgeinity of capital and risk using Durbin-Wu-Hausman Test. In this study we estimate the following systems of simultaneous equations

1. Capital Equation

$$\mathbf{CARit = a_0 + a_1*BSZ_{it} + a_2*ROA_{it} + a_3*ROE_{it} + a_4*PRES_{it} + a_5*CRSK_{it} + a_6*INFL_{it} + a_7*GDP_{it} + e_{1it}}$$

2. Risk Equation

$$\mathbf{CRSK_{it} = b_0 + b_1*BSZit + b_2*ROA_{it} + b_3*ROE_{it} + b_4*PRES_{it} + b_5*CAR_{it} + a_6*INFL_{it} + a_7*GDP_{it} + e_{1it}}$$

Where;

CAR=Capital Adequacy; the share of equity on total assets of the bank. Capital Adequacy shows the strength of bank capital against the vagaries of economic and financial environment

BSZ (Size of the bank): logarithm of total assets of the bank. Size can show the economies of scale. ROA (Profitability): Returns on Assets; this is the ratio of net profit before tax to total asset. ROA depicts how the bank uses its assets to generate profits

ROE (Profitability) = Returns on Equity

CRSK= Credit Risk; measured as the ratio of net loans to total assets

PRES= Regulatory Pressure; Measured as the dummy variable which takes the value 1 when the bank's capital ratio is within the minimum required capital requirement and 0 otherwise as depicted by Rime (2001). In Tanzania according to Banking and Financial Institutions Act (2014) a bank or any financial institution at any time has to maintain;

c) Core capital of not less than twelve and one half per cent of its total risk-weighted assets and off balance sheet exposure; and

d) Total capital of not less than fourteen and one half per cent of its total risk weighted assets and off balance sheet exposure

The variables used in this study are summarized in table 1 below

Table 1: Definitions and sources of variables

Variable	Definition	Adapted From
ROA-Returns on Assets	Net profit before tax to total asset	Chin, (2011); Naceur, 2003; Ongore and Kusa, (2013)).
Bank size (BSZ)	The natural logarithm of total assets	Boyd et al, (2009).
ROE-Returns on Equity	Net profit after tax to owners' equity	Khrawish, (2011);
Regulatory pressure (Pres):	Dummy variable, which takes 1 if the bank's capital ratio is 12.5% , and zero otherwise	Banking and Financial Institutions Act (2014)
Capital Adequacy	Equity-to-total assets	Gul, (2011)
Credit risk	Net loans to total assets	Gul, (2011)

5. Empirical Findings and Discussions

This part of the paper reports the empirical results obtained from this study from the simultaneous equation framework specified in the methodology part where capital is an endogenous variable in risk equation while risk is an endogenous variable in capital equation. The 2SLS estimation has been applied to take care of the endogeneity problem. In this study, the balanced panel model has been utilized.

5.1 Descriptive Statistics

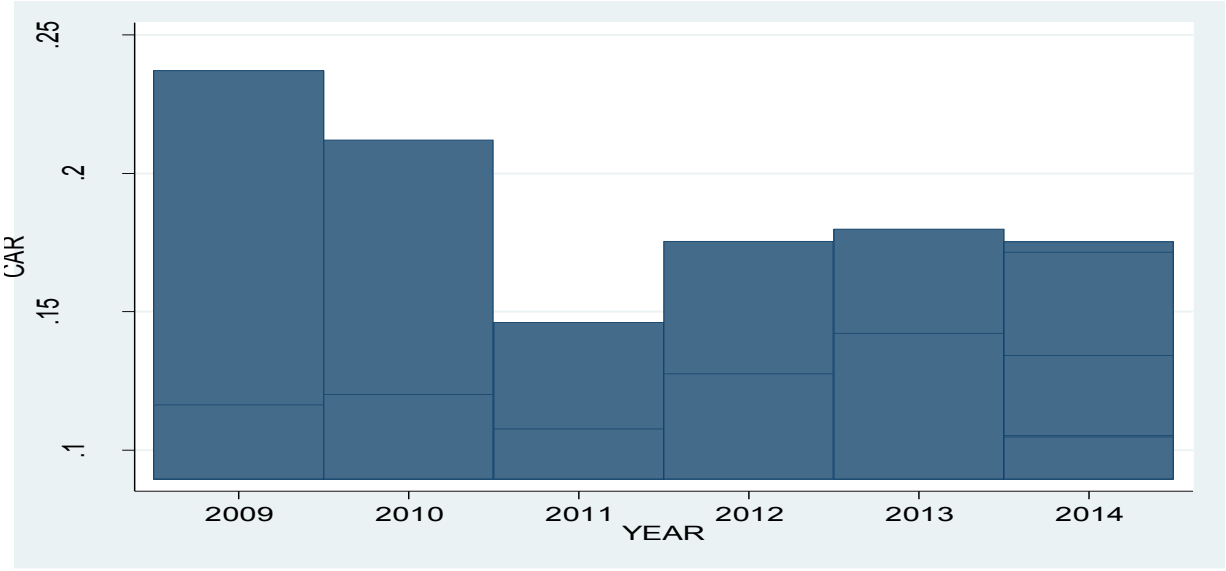
The descriptive statistics is presented in the table 2 below. It can be observed from table 2 below that average bank capital is 12.6% with minimum of 23.7% and minimum value of 8.9%. This shows that the average bank capital in the sample of larger commercial banks in Tanzania is within the capital requirement level of 12.5% set by BOT although the minimum value is below the regulatory requirements. However, the capital ratio in Tanzanian large commercial banks is well above the minimum regulatory capital stipulated in Basel I-III. Average bank credit risk is roughly 48% with maximum of 71% and minimum of about 18%. Average

profitability measured as ROA is about 2% and that measured in terms of ROE is about 16%.

Table 2: A descriptive statistics table

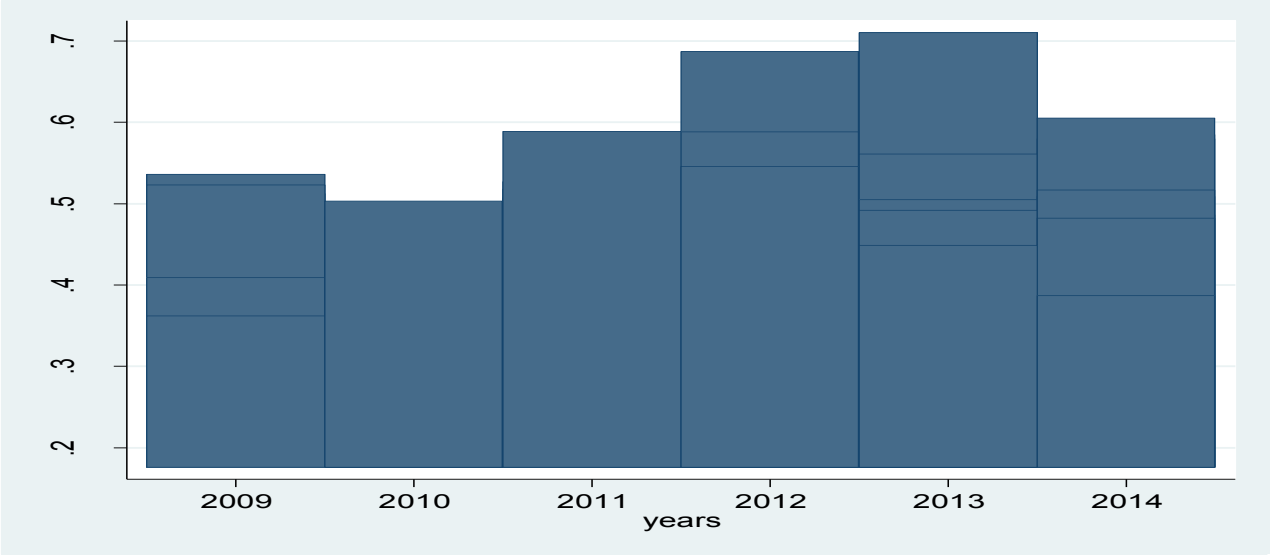
```
. summarize car loanstacr roa roe size infl gdp

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
         car |        48    .1264725    .0301037   .0895609   .2371712
    loanstacr|        48    .4782708    .1022776       .176        .71
         roa |        48    .0201331    .0152364  -.0207176   .0532177
         roe |        48    .1559192    .1132833  -.1742008   .3292395
        size |        48    13.90863    .6163424    13.1305   15.23251
-------------+--------------------------------------------------------
        infl |        48       7.025     .591608          6        7.9
         gdp |        48    .0926042    .0259137       .062       .127
```

The trend of capital ratios has been up and down for the period of the study. Graph 1 below shows that between 2009 and 2011 the level of bank assets has been on a decline side from 23.7% to almost 15% but the ratio picked up again to around 18% and remained fairly around this figure until 2014



Graph 1: Trend of Bank Capital Ratios for 2009-2014

On the other hand the average bank credit risk measured by net loans-to- total assets has been increasing consecutively since 2010-2013 and then dropped in 2014 as presented in graph 2. From the two graphs we can see that the fall in capital ratio from 2009-2011 may have resulted in the increase in credit risk in 2010-2013.



Graph 2: Trend of Bank credit risk for 2009-2014

5.2 Regression Analysis

Before estimating our systems of simultaneous equation we decided to make a decision of checking the consistence of a set of estimates obtained by least squares. According to Davidson and MacKinnon (1993) an augmented regression test (DWH test) is appropriate for this purpose. Here we included the residuals of each endogenous right-hand side variable, as a function of all exogenous variables, in a regression of the original model. So we first perform a regression: $CAR_{it} = c_0 + c_1*BSZ_{it} + c_2*ROA_{it} + c_3*ROE_{it} + c_4*PRESit + c_5*CRSK_{it} + a_6*INFL_{it} + a_7*GDP_{it} + e_{3it}$ and the regression results presented in table 3 below.

Table 3: Regression of original model

```
. reg  car dummycar loanstacr roa roe size infl gdp

      Source |       SS       df       MS              Number of obs =      48
-------------+------------------------------           F(  7,    40) =   48.75
       Model |      .038124     7  .005446286           Prob > F      =  0.0000
    Residual |  .004468803     40   .00011172           R-squared     =  0.8951
-------------+------------------------------           Adj R-squared =  0.8767
       Total |  .042592803     47   .00090623           Root MSE      =  .01057

------------------------------------------------------------------------------
         car |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    dummycar |   .0158109   .0041882     3.78   0.001     .0073462    .0242755
   loanstacr |   .0368027   .0166093     2.22   0.032     .0032341    .0703714
         roa |   3.992975   .4034455     9.90   0.000     3.177582    4.808369
         roe |  -.4565915   .0549062    -8.32   0.000     -.567561    -.345622
        size |    .000348   .0033053     0.11   0.917    -.0063322    .0070282
        infl |   .0024189   .0027825     0.87   0.390    -.0032048    .0080426
         gdp |  -.0298794   .0602713    -0.50   0.623    -.1516922    .0919334
       _cons |    .074347   .0467647     1.59   0.120    -.0201679    .1688619
------------------------------------------------------------------------------
```

After that we got residuals *CARit_res,* and then performed an augmented regression; $RSKit = d_0 + d_1*CARit + d_2*CARit\_res, + e_{4it}$ to test the endogeneity between capital and risk as presented in table 2:

Table 2: Testing Endogeneity

```
. reg car car_res

      Source |       SS       df       MS              Number of obs =      48
-------------+------------------------------           F(  1,    46) =  387.11
       Model |  .038069075     1  .038069075           Prob > F      =  0.0000
    Residual |  .004523728    46  .000098342           R-squared     =  0.8938
-------------+------------------------------           Adj R-squared =  0.8915
       Total |  .042592803    47   .00090623           Root MSE      =  .00992

------------------------------------------------------------------------------
         car |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     car_res |           1   .0508257     19.68   0.000     .8976932    1.102307
       _cons |  -1.47e-09   .0065855     -0.00   1.000    -.0132559    .0132559
------------------------------------------------------------------------------

. test car_res

 ( 1)  car_res = 0

       F(  1,    46) =  387.11
            Prob > F =    0.0000

.
```

Because d_2 in the augmented regression is significantly different from zero, then OLS is inconsistent since error terms of capital equation and risk equations correlate with independent variables of each equation. The endogeneity of the both capital and risk equations is take care by two-stage least squares (2SLS) methodology which ensures consistent parameter estimates as presented in table 3

5.3 Regression Results

The results presented in table 4 shows that; banks' capital ratio in Tanzanian Large commercial banks is directly related to the bank risk- taking. The table shows that the positive relationship between capital and risk is statistically significant at statistically significant at 5% significant level. This shows that as the level of banks' risk increases bank managers tend to increase the bank capital ratios so as to protect a bank from violating the regulatory minimum capital requirements. A positive association between risk and capital is not a surprise as such kind of relationship holds in banks with average capital ratios in excess of the regulatory minimum capital requirement as in our case where the average banks capital ratio is 12.6% while the regulatory minimum required by BOT is 12.5%. Other studies with similar results on risk-capital nexus are Aggrawal and Jacques (2001), Rime (2001) & Shrieves and Dahl (2003).

Another interesting result is the relationship between regulatory pressure (a variable which take a value of 1 if a bank meets regulatory minimum capital requirement and 0 otherwise.) and capital as well as risk. Table 4 shows that regulatory pressure has a positive and statistically significant relationship with capital at 1% significant level but this variable has no significant relationship with bank risk. This results show that, in the capital equation, banks whose capital ratio comes closer to minimum requirements increase the proportion of risk-based assets in their portfolio unlikely in the risk equation where banks approaching the minimum capital requirements do not either increase or decrease the share of risk-based assets. This result is similar to the one presented by Rime, (2001)

The positive impact of regulatory pressure on bank capital shows that Tanzanians larger commercial banks approaching the minimum capital requirements are inclined to improve their capital base so as to circumvent the penalties resulted from violation of the legal requirements of keeping minimum capital. This finding is in line with capital buffer theory previously discussed which envisages that due to a worry to incur costs associated with the violation of capital requirements bank approaching the regulatory minimum capital ratio may increase capital and reduce risk.

Further results from table 4 shows a positive and significant association between profitability measured by Returns on Asset (ROA) consistent to other studies such as Alsbbagh (2004) and negative relationship between Capital and Return on Equity (ROE) similar to Bokhari and Ali (2009); Büyüksalvar and Abdioğlu (2011). Both relationships are statistically significant at 1% significant level. The coefficient attached to ROA shows that as one unit of in profitability increases bank capital increases by 3.99 units units. Likewise, a unit increase in profitability measured by ROE reduces the banks' capital by 0.46 units. A positive relationship between banks' earnings and banks' capital implies that, as the profitability of banks increases they retain more earnings to increase the level of their capital. On the other hand, GDP growth has negative impact on capital but positive on risk and inflation has a positive impact on both capital and risk but these relationships are statistically insignificant.

Table 4: Two-Stage Least Square Regression Results

Two-stage least-squares regression

Equation	Obs	Parms	RMSE	"R-sq"	F-Stat	P
car	48	7	.0105698	0.8951	48.75	0.0000
loanstacr	48	7	.0949607	0.2664	2.07	0.0558

	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
car						
dummycar	.0158109	.0041882	3.78	0.000	.0074761	.0241456
loanstacr	.0368027	.0166093	2.22	0.030	.0037492	.0698563
roa	3.992975	.4034455	9.90	0.000	3.190093	4.795857
roe	-.4565915	.0549062	-8.32	0.000	-.5658583	-.3473248
size	.000348	.0033053	0.11	0.916	-.0062297	.0069257
infl	.0024189	.0027825	0.87	0.387	-.0031185	.0079563
gdp	-.0298794	.0602713	-0.50	0.621	-.1498231	.0900642
_cons	.074347	.0467647	1.59	0.116	-.0187177	.1674116
loanstacr						
car	2.97055	1.340628	2.22	0.030	.3026162	5.638484
dummycar	-.0253688	.0436369	-0.58	0.563	-.112209	.0614713
roa	-19.95045	5.946451	-3.36	0.001	-31.78427	-8.116637
roe	2.35219	.7250466	3.24	0.002	.9093012	3.795078
size	-.0218862	.0294969	-0.74	0.460	-.080587	.0368145
infl	.0026338	.0252303	0.10	0.917	-.0475762	.0528438
gdp	-.0433896	.5431056	-0.08	0.937	-1.124204	1.037425
_cons	.4374562	.4276551	1.02	0.309	-.4136046	1.288517

Endogenous variables:
Exogenous variables: car dummycar loanstacr roa roe size infl gdp

6. Conclusions

The motive of this study was to examine the relationship between capital and risk-taking behavior of Tanzanian commercial banks during the period 2009-2014 using the Two Stage Least Square (2SLS) method of estimation. The empirical findings reveal a direct relationship between capital ratios and bank risk-taking behavior. This implies that as the level of banks' risk increases bank managers tend to increase the bank capital ratios so as to prevent banks from violating the regulatory minimum. This finding is consistent with the fact that banks whose capital ratio is approaching minimum regulatory capital requirement level would tend to increase their risk level so as to take advantage of possible proceeds that the banks could use to improve and strengthen their capital base.

Furthermore, the study found that regulatory pressure has a positive and statistically significant relationship with bank capital but has no significant relationship with bank risk-taking. The positive impact of regulatory pressure on bank capital shows that Tanzanians larger commercial banks approaching the minimum capital requirements are inclined to improve their capital base so as to circumvent the penalties resulted from violation of the legal requirements of keeping minimum capital, the results consistent with capital buffer theory.

The study also found a positive and significant association between profitability and bank capital. A positive relationship between banks' earnings and banks' capital shows that as the profitability of banks increases they retain more earnings to raise the level of their capital. Hence, it is concluded that banks' improvement in profitability helps to increase their capital ratios so as to protect them from failure when they take additional risks.

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