

## **IMPACT OF NON INTEREST INCOME ON BANKING PERFORMANCE IN TANZANIA**

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### **Abstract**

*The study investigated impact of noninterest income on bank performance in case of Tanzanian banking sector using Fixed effect model (FEM) for the period of 2002 to 2012. The sample of 25 banks with more than 90 percent market share based total assets was used. The findings suggest that relying on noninterest income activities may adversely affect bank performance. Besides the study found that interest income has positive impact on performance. However due to improvement of technology, competition, existences of interest forbidden society, deregulation then focus only on interest income activities in this modern age might not be viable. Thus diversification might be the best alternative because findings confirmed hypothesis that diversification is good for the banking sector performance in Tanzania.*

*Keywords: Bank Performance, Noninterest Income, Interest Income, Diversification, Fixed Effect Model, Random Effect Model*

### **INTRODUCTION**

Fundamentally financial flows of commercial banks are from the intermediation process (e.g., interest paid on deposits, interest received from loans and securities, and the resulting net interest margins). However, over the decade commercial banks especial in developed countries gradually expanded beyond these tradition sources of revenue towards fee-earning, trading profit and loss, commissions and other non interest income sources. For example, the share of non-interest income on operating income increased from 19% in 1980s to 43% in 2001 for US commercial banks (Stiroh, 2004) whereas there was an increase from 26% in 1989 to 41% 1998 for European banks (ECB, 2000)

Previous studies revealed that increased competition, technological advancement, and financial market integration, country's specific regulatory and legislative innovation are among factors contributing to this diversification trend (DeYoung & Roland, 2001). Moreover, the introduction of Islamic banks or windows aiming to accommodate interest forbidden society has also contributed to the trend (Karakaya & Er, 2013). These factors created pressure on traditional banking activities and necessitated banks to react by diversifying into new revenue sources.

There are two different contrasting schools of thought on optimal bank scope. One sets of arguments holds that restricting banking scope to their traditional activities reduces likelihood of failure related to risk businesses while the second set argue that diversification enhance bank profitability and reduces idiosyncratic risk (Saunders, Schmid, & Walter, 2014). The contradicting views attracted researchers' attentions especially in Europe and US. The study noted that topic is widely documented for U.S and European banking Industry but little is known in Tanzania. Thus this study focuses on nexus between noninterest income and bank performance in Tanzania. Noninterest income makes an important component of bank's revenue in Tanzania. Recently indicates increasing trend where noninterest income accounted about 38.3% of Gross income in 2006 but increased to 44.7% in 2010 as extracted from (Ernst&Young-Tanzania, 2010)

### **Overview of Tanzanian banking sector**

The banking sector started to develop after the 1991 reforms following enactment of banking and financial institutional Act of 1991. The act established mechanism for enhancing competition and efficiency through liberalization and proper supervisory power. Prior to the reform the banking sector was state owned and its performance was not impressive. The sector had only few financial institutions i.e. only one bank known as National Bank of Commerce accounted for almost 90-percent of the total assets of the banking sector (ADF-Tanzania, 2000). However as a result of reform more banks were established from 4 banks in 1991 to 52 banks in 2013 (BOT-Tanzania, 2014). The reform measures brought remarkable development. To highlight few indicators; there has been continued increase in total assets e.g. TZS 5,294/=billion in 2006 to TZS 18,935/= billion in 2013. Also increased customer deposit from TZS 4,239/= billion in 2006 to TZS 14,411/= billion in 2013 (Ernst&Young-Tanzania, 2013)

Despite these impressive development indicators, the study noted a challenge to be addressed. Data extracted from different survey reports reveal sector's return on asset (ROA) trend to be not impressive, e.g. it has decreased from 2.5% in 2006 to 1.6% in 2013. On the other hand noninterest income component in the sector continued to increase from TZS 172/= billion in 2006 to TZS 620/= billion in 2013 (Ernst&Young-Tanzania, 2011 &2013). Therefore the

aim of this study was to find empirical link between noninterest income and risk adjusted return on assets and equity.

Banking sector in Tanzania can be categorized in a number of ways. Classification may either depend on size, ownership or origin. Depending on size there are large banks and small banks. The sector has eight large banks dominating the sector with more than 75 percent market share based on total assets (see table 1, methodology section). On the other hand the sector composes foreign and domestic banks. Based on the sample of 25 banks out of 49 existing in 2012 (see list of names in appendix 1) revealed that foreign bank account about 54 percent market share compared to 46 percent of domestic banks. In addition following the reform there are few state owned banks and the sector is dominated by private sector which account more than 95 percent market share based on total assets (see table 2, methodology section).

Across all types of banks study found increased share of non interest income may adversely affect the return on assets and equity. Therefore sector should consider diversification as the best alternative to ensure good return on assets and equity. On the other hand study found a share of net interest income to have positive impact on performance, however, focus on interest income activities in this modern age might not be viable because of the existing challenges i.e. improved technology, competition, interest forbidden society, regulation etc making difficult to rule out noninterest income activities.

The rest of the study is structured as follows. Section II review of Literature, hypothesis development and Section III Methodology, Section IV presents findings and discussion and Section V point out conclusion and suggestion for future research

## REVIEW OF LITERATURE

In many studies profitability of the bank has been used to gauge performance (Amin, Sanusi, Kusairi, & Abdallah, 2014; Swai & Mbogela, 2014; Qin & Pastory, 2012). This is perhaps because profitability has a tendency to absorb risks and shocks that banks may face (Qin & Pastory, 2012). On this regard return on assets and return on equity are widely used as a proxy for profitability to cite few (Chiorazzo, Milani, & Salvini, 2008; Karakaya & Er, 2013; Sanya & Wolfe, 2011).

Capital structure, assets size, operating expenses, provision and contingencies are among the factors influencing bank profitability (Bodla & Verma, 2007), Apart from that Bodla & Verma explained that non-interest income is also among the significant factor influencing bank profitability. Traditionally banks have been long earning noninterest income in providing traditional banking services such as checking, trust, letter of credits and cash management but

recently banks have been earning noninterest from new sources (DeYoung & Roland, 2001). This new source on none interest income opportunity can be highly traced from securitization of mortgage, credit cards and other loan products presents banks. Other sources are such as insurance and mutual fund sales.

Theories suggest that if interest and non interest income are negatively or weakly correlated then diversification is desirable for risk management and profitability enhancement (Elton et al 2003 p44). Similarly to diversify across income sources is desirable for risk management and efficiency which bring profitability enhancement (Chiorazzo, Milani, & Salvini, 2008; Klein and Saidenberg, 1997; Morgan & Samolyk, 2003). Though on contrary (DeYoung & Roland, 2001) argue that inefficiencies may increase (especially with geographical diversification) because with the distance between bank holding companies headquarters and its subsidiaries which gives leeway for mismanagement. That means DeYoung & Roland highlighted different diversification strategy such as loan portfolio diversification in different industries and geographical areas. The other is diversification strategy towards noninterest revenue sources. This study covers diversification strategy towards the second strategy.

The recent increasing trend towards increasing noninterest income generating activities has been promoted by a number of factors like increased competition, technological advancement, and financial market integration, country's specific regulatory and legislative innovation (DeYoung & Roland).

Moreover, introduction of Islamic banks or windows aiming to accommodate interest forbidden society has also contributed to the trend (Karakaya & Er, 2013).. Perhaps this recent trend may also be explained by the need to exploits excess banks-specific assets such as brand names, managerial skills, consumer loyalty, technological innovation, service quality, etc (Markides 1996)

There are two different contrasting schools of thought on optimal bank scope. One sets of arguments holds that restricting banking scope to their traditional activities reduces likelihood of failure related to risk businesses while the second set argue that diversification enhance bank profitability and reduces idiosyncratic risk(Saunders et al., 2014). Therefore this attracted researchers especially in Europe and US.

The table 1 above depicts contradicting empirical results on interrelationship between noninterest income and bank performance. Significant number of studies on US banking sector e.g. (Stiroh, 2006; Stiroh, 2004; DeYoung & Roland, 2001) show noninterest unfavorably affect bank performance either by reducing return or increasing income volatility. However the study by (Saunders et al., 2014) with more large sample of US banks found noninterest income to be associated with higher profitability across all banks groups. Perhaps negative influence of

noninterest income on bank performance may be explained by managerial diseconomies where transaction costs outweigh the benefit (Markides, 1996).

Table 1: Summary of the studies on nexus between banks' performance and noninterest income

| AUTHOR                          | METHODOLOGY   | FINDINGS   |
|---------------------------------|---|--|
| (Nguyen et al., 2015)           | Sample: 32 Vietnamese domestic banks. Period 2005 – 2012 Method: Panel regression model. REM and FEM with Hausman test robust check     | Bank with high non-interest income present lower risk than those with mainly interest income. In addition small banks impacts of income diversification are not confirmed clearly  |
| (Saunders et al., 2014)         | Sample: 10,341 US banks. Period: 2002-2013. Method: Fixed effect Panel regression   | Higher ratio of non-interest income to interest income is associated with a higher profitability across the banking sector and under different market regimes. The results hold across bank size groups.                             |
| (Karakaya & Er, 2013)           | Sample; 30 Turkey banks. Period 2005 – 2010. Method; Panel regression model using OLS and GLS. Hausman test and LLC unit root test used | Noninterest income increases equity capital adequacy.  |
| (Sanya & Wolfe, 2011)           | Sample: 226 listed banks across 11 emerging economies. Period; 2000 – 2007. Method: Panel regression method used System-GMM             | Diversification across and within both interest and non-interest income generating activities decrease insolvency risk and enhance profitability   |
| Sherene A. Bailey-Tapper (2010) | Period: 1999 – 2010. Method: SUR model to panel data  | Stronger performance in non-interest income not only leads to increased profitability but also increased variability in performance  |
| (Chiorazzo et al., 2008)        | Sample; 85 Italian banks. Period: 1993 – 2003 Method: Panel regression model  | First; Income diversification increase risk adjusted return consistent to EU studies but differ to US. Second small banks can make gain on increasing noninterest income but only when have little share to start with.              |
| (Ebrahim & Hasan, 2008)         | Period: 1993 – 2002: Method: Multivariate analysis  | Annual abnormal returns have more significant positive relation with changes in the noninterest component of bank earnings compared with changes in the interest component of earnings. The results are more obvious for small banks |
| (Hayden et al., 2007)           | Sample: German banks Period; 1996 to 2002. With 3,529 total observations. Method: Panel regression model                                | Diversification tends to be associated with reductions in bank returns, even after controlling for risk  |
| (Stiroh, 2006)                  | Sample: 635 US banks Period: 1997 -2004. Method: Cross section analysis and Panel regression model                                      | Banks most reliant on activities that generate noninterest income do not earn higher average equity returns, but are much more risky as measured by return volatility (both total and idiosyncratic) and market betas.               |

|                          |  |   |
|--------------------------|--|---|
| (Stiroh, 2004)           | Sample: 4552 US community banks. Period:1984 – 2000. Method: Cross section regression using OLS using average values | Increased focus on noninterest income generating activities is associated with declines in risk adjusted performance of community banks   |
| (Acharya et al., 2002)   | Sample: 105 Italian banks. Period: 1993–1999. Method: Panel regression   | Industrial loan diversification reduces bank return while endogenously producing riskier loans. Geographical diversification result in an improvement in the risk–return trade-off for banks with low levels of risk. |
| (DeYoung & Roland, 2001) | Sample: 472 U.S. commercial banks. Period: 1988 to 1995. Method: Cross section regression analysis using OLS         | Replacing traditional lending activities with fee-based activities is associated with higher earnings volatility.   |

On the other hand table 1 shows studies conducted in other countries other than US e.g. Vietnam (Nguyen, Vo, & Nguyen, 2015), Turkey (Karakaya & Er, 2013), cross country study (Sanya & Wolfe, 2011) and Italian banks study (Chiorazzo et al., 2008) found noninterest income positively affect bank performance. The review identified one study for German banks by (Hayden, Porath, & Westernhagen, 2007) which was contradictory to many in the region arguing diversification to be associated with reduction in bank return.

Thus review provides evidence that there is no consensus on the role of noninterest income on bank performance. Also noted this type of study is limited in the context of Tanzania. This necessitates similar studies in different context to bring more light on nexus between banking sector performance and non interest income.

## Hypothesis

Based on large number of reviewed articles which found a positive impact of noninterest income on banks performance such as (Chiorazzo et al., 2008) (Karakaya & Er, 2013), (Nguyen et al., 2015). Therefore we hypothesize that;

**H1: *There is a positive relationship between noninterest income and Bank's performance.***

On the other hand this study has considered increasing expansion towards noninterest income as a diversification strategy. Hence by adapting second school of thought highlighted by (Saunders et al., 2014) that diversification enhance bank profitability and reduces idiosyncratic risk, we hypothesize that;

**H2: *There is a positive relationship between diversification and Bank's performance.***

These hypotheses were tested by regression analysis where proxy for performance were Return on Assets (ROA) and Return on Equity (ROE) and diversification was Herfindahl-Hirschman Index. These variables have been adapted from a number of studies such as (Stiroh, 2004 Hayden, Porath, & Westernhagen, 2007, Chiorazzo et al., 2008 Karakaya & Er, 2013 and Nguyen, Vo, & Nguyen, 2015)

## METHODOLOGY

### Description of Data

The study used data from individual banks' annual reports submitted to the Central bank of Tanzania (BOT). The study selected a sample of 25 banks out of 49 which were operating during 2002 to 2012 making a total of 275 observations. The sample represents more than 90 percent of market share of the whole banking sector in Tanzania based on total assets. This is evidenced on table 2 where eight large banks included in a sample account more than 75 percent of the sector's total assets. The other seventeen small banks included in sample accounted more than 15 percent of market share. While excluded banks from this study take less than five percent of the market share.

Table 2: Market Share of Eight Large Banks in Tanzanian Banking Sector

| DETAILS/YEARS                               | 2006      | 2007      | 2008      | 2009      | 2010       | 2011       | 2012       |
|---|-----------|-----------|-----------|-----------|------------|------------|------------|
| Total asset (in TZS millions)               | 5,294,029 | 6,903,832 | 8,276,512 | 9,817,271 | 12,364,754 | 14,281,738 | 16,644,786 |
| Large banks total assets (in TZS millions)  | 4,462,185 | 5,714,641 | 6,655,811 | 7,651,599 | 9,351,262  | 10,565,638 | 11,901,164 |
| Large banks share of total assets in sector | 84%       | 83%       | 80%       | 78%       | 76%        | 74%        | 72%        |

Source: Compiled by Author from various sources

The sample was split into subgroups; based on size there are seventeen banks considered small and eight banks considered to be large. On the basis of origin ten banks were domestic and fifteen banks foreign. Lastly in terms of ownership pattern where four banks are state owned and twenty one banks are privately. (For list of names see appendix 1). Table 3 next provide a summary description of each sub group.

Table 3: Sub Samples Description Based On Average For The Period Of 2002 To 2012

|  | Large | Small | Total       | Private | Public | Total       | Domestic | Foreign | Total       |
|--|-------|-------|-------------|---------|--------|-------------|----------|---------|-------------|
| Number of banks                              | 8     | 17    | <b>25</b>   | 21      | 4      | <b>25</b>   | 10       | 15      | <b>25</b>   |
| Share of total assets out of 25 banks        | 81%   | 19%   | <b>100%</b> | 95%     | 5%     | <b>100%</b> | 46%      | 54%     | <b>100%</b> |
| Share of Non interest income out of 25 banks | 84%   | 16%   | <b>100%</b> | 96%     | 6%     | <b>100%</b> | 43%      | 57%     | <b>100%</b> |

Source: Calculated based on Individual banks report submitted to Central bank of Tanzania (BOT)

### Description of variables

The performance of the bank is expressed using two dependent variables. The risk adjusted Return on Asset (SHROA) and Return on equity (SHROE) were used. The formula for calculating these variables are below as adapted from (Chiorazzo et al., 2008)

$$SHROA_{i,t} = \frac{ROA_{i,t}}{\sigma_{ROA_i}}$$

(1)

$$SHROE_{i,t} = \frac{ROE_{i,t}}{\sigma_{ROE_i}}$$

(2)

In order to examine the impact of noninterest income on proxy for bank performance eight independent variables were used. It is important to note that the study has used two independent variables which are components of operating income i.e. share of noninterest income (NONIs) and share of net interest income (NINs) on operating income as entirely separate. NONIs includes only foreign exchange trading Profit / Loss, Commissions and Fees-Foreign Operations, Other Commissions & Services Charges and Securities Trading Gain/Loss. NINs includes interest receivable minus interest payable. However (DeYoung & Roland, 2001) argued that it is difficult to do complete separation among the two because financial statements includes some loans or deposits-related fees (e.g., fees from loan commitments, standby letters of credit, loan servicing, accounts charges) in the noninterest income category. DeYoung & Roland also argued that the more the separation the more the insight on specific line of business with regard to the banking performance. Therefore this study excluded accounts



charges to reduce elements of interest related fees in non interest income. The formula below used to calculate NONIs and NINs as also adapted from (Chiorazzo et al., 2008).

$$NONIs = \frac{NONI}{NONI + NIN}$$

(3)

$$NINs = \frac{NIN}{NONI + NIN}$$

(4)

Where NIN and NONI are net interest income and noninterest income respectively and their sum (NIN+NONI) is operating income.

The other independent variable used is diversification index (DIV) calculated using Herfindahl-Hirschman Index, see formula in equation 5 below. DIV score ranges from 0 to 0.5, where zero means the bank has not diversified at all while 0.5 means perfect diversification among the two activities. This variable is used to explore the impact of banks' simultaneous participation in both noninterest income activities and interest income activities on bank performance.

$$DIV = 1 - (NONIs^2 + NINs^2)$$

(5)

Other independent variables as cited from (Acharya, Hasan, & Saunders, 2002; Chiorazzo et al., 2008) used are the controlling on banks performance. There are macro economic variables such as Inflation rate (INFL) and GDP growth (GDPGR), others are bank/industry specific controlling variables i.e. the ratio of book value of Equity to total assets (EQTY/TAST), ratio of total assets to GDP (TAST/GDP), ratio of total loans to total assets (TLON/TAST) and natural logarithm of total assets (LNTAST) during the analysis.

### Model specification

To test our hypothesis the panel regression models were applied. This modeling technique normally is applied to a data set comprising both cross section and time series elements. The superiority of panel data in question is because it contain more information, it incorporates variability among cross section units and across time (Gujarati, 2004 p638). Models applied in this study are shown in equation 6 and 7 below as adapted from (Karakaya & Er, 2013).

$$Y_{i,t} = c + \sum_{i=1}^k \lambda_i D_i + \sum_{j=1}^k \beta_j X_{i,t} + \sum_{j=1}^k \phi_j Z_{i,t} + \mu_{i,t}$$

(6)

$$Y_{i,t} = c + \sum_{j=1}^k \beta_j X_{i,t} + \sum_{j=1}^k \phi_j Z_{i,t} + \mu_{i,t}$$

(7)

Equation 6 represents fixed Effect model (FEM) while equation 7 represents random effect model (REM). Where Y stands for dependent variables, X stands for a set of independent variables and Z is a set of controlling variables, D is a set of banks' fixed effect dummies, while  $\lambda$ ,  $\beta$ ,  $\phi$  represent coefficients for stated variables. All variables are explained in section 3.2 above. The subscript i represent cross section units and t represent time from 2002 to 2012.

This study employed both FEM and REM in the estimation process however Hausman test was carried out to check robustness among the two. It was found FEM model to be more appropriate as reported in table 4.3 and 4.4 below. Hausman test normally assumes REM and FEM estimators do not differ substantially in a null hypothesis. Alternatively FEM is appropriate assuming there is correlation between error term and explanatory variables. Decision rule is i.e. under 5% significant level, if calculated Hausman statistic has probability less than 0.05 then it is possible to reject null hypothesis meaning FEM is appropriate.

Conventionally three panel regression models are commonly used i.e. pooled OLS regression model, fixed effect regression model (FEM) and random effect model (REM). However it is not straightforward to state the optimal model (Nguyen et al., 2015). The selection would depend on the assumptions made. These assumptions are based on intercept, the slope coefficients and error term. Pooled OLS regression model is appropriate if intercept and slope coefficients are assumed constant across time and space and the error term captures the differences over time and individuals. (Gujarati, 2004 p638). However this is highly restrictive method as it assumes that all individuals equally behave in response to the changes in independent variables. Fixed effect regression model (FEM) is more practical because it assume heterogeneity across individuals. It captures individuals' differences through intercepts. Normally it introduces individual's dummies in the model. Time dummies may also be introduced in the model to capture varying intercept across individuals and over time. However FEM may suffer multicollinearity problem due to introduction of many dummy variables. Thus Gujarati, (2004 p638) state that some of FEM problem may be sorted out by Random Effect Model (REM). The major difference between FEM and REM is that each cross unit has its own intercept in FEM while under REM assume mean intercepts for all cross section units. It is shown that the appropriate method of estimation for REM is generalized least square (GLS) because it assume error term correlation between two cross section units on two point in time.

## EMPIRICAL FINDINGS AND DISCUSSION

### General variables assessment

Multicollinearity and panel unit root tests were conducted as part of preliminary assessment of variables. Table 4 represents correlation matrix for overall sample, small banks sample and large banks sample. The matrix aims to test multicollinearity among independent and controlling variables. The table revealed same conclusion across all samples. NINs and NONIs were perfectly negatively correlated which necessitated not to enter simultaneously in the model. DIV depicted high level of collinearity with NONIs and NINs however its inclusion in the model significantly improved R-square as proved by stepwise regression hence was not dropped. In addition TAST/GDP and LNTAST were highly correlated but also were not dropped because their inclusion improved the R-square and Durbin Watson statistic.

Table 4. CORRELATION MATRIX

|           | NINS    | NONIS   | DIV     | TAST_GDP | INFL    | TLON_TAST | LNTAST  | GDPGR  | EQTY_TAST |
|-----------|---------|---------|---------|----------|---------|-----------|---------|--------|-----------|
| NINS      | 1.0000  |         |         |          |         |           |         |        |           |
|           | -1.0000 |         |         |          |         |           |         |        |           |
|           | -1.0000 |         |         |          |         |           |         |        |           |
| NONIS     | -1.0000 | 1.0000  |         |          |         |           |         |        |           |
|           | -0.7950 | 0.7950  |         |          |         |           |         |        |           |
|           | -0.7972 | 0.7972  |         |          |         |           |         |        |           |
| DIV       | -0.7943 | 0.7943  | 1.0000  |          |         |           |         |        |           |
|           | -0.0240 | 0.0240  | 0.1231  |          |         |           |         |        |           |
|           | -0.0330 | 0.0330  | 0.0871  |          |         |           |         |        |           |
| TAST_GDP  | 0.3018  | -0.3018 | -0.2159 | 1.0000   |         |           |         |        |           |
|           | 0.1253  | -0.1253 | -0.0842 | 0.0967   |         |           |         |        |           |
|           | 0.1250  | -0.1250 | -0.0487 | 0.4746   |         |           |         |        |           |
| INFL      | 0.1321  | -0.1321 | -0.2300 | 0.1736   | 1.0000  |           |         |        |           |
|           | 0.4693  | -0.4693 | -0.3616 | -0.0914  | 0.3119  |           |         |        |           |
|           | 0.5104  | -0.5104 | -0.4119 | 0.1123   | 0.3295  |           |         |        |           |
| TLON_TAST | 0.3117  | -0.3117 | -0.1000 | 0.0240   | 0.2804  | 1.0000    |         |        |           |
|           | -0.0311 | 0.0311  | 0.1353  | 0.8030   | 0.4367  | 0.0273    |         |        |           |
|           | 0.0557  | -0.0557 | 0.0290  | 0.8878   | 0.6870  | 0.2144    |         |        |           |
| LNTAST    | 0.2428  | -0.2428 | -0.2508 | 0.8037   | 0.5928  | 0.1324    | 1.0000  |        |           |
|           | -0.0517 | 0.0517  | 0.0453  | -0.0676  | -0.5696 | -0.1115   | -0.2556 |        |           |
|           | -0.0628 | 0.0628  | 0.0224  | -0.3024  | -0.5694 | -0.1135   | -0.4025 |        |           |
| GDPGR     | -0.0239 | 0.0239  | 0.1382  | -0.1279  | -0.5698 | -0.1103   | -0.3441 | 1.0000 |           |
|           |         |         |         |          |         |           |         | 0.0422 |           |
|           | 0.0902  | -0.0902 | -0.1973 | -0.2020  | -0.0653 | -0.0589   | -0.2446 | 0.0836 |           |
|           | 0.0890  | -0.0890 | -0.1644 | -0.0075  | -0.1313 | -0.1297   | -0.1339 | -      |           |
| EQTY_TAST | -0.1861 | 0.1861  | -0.0976 | -0.0588  | 0.3808  | 0.1395    | 0.2048  | 0.2373 | 1.0000    |

Note: The table comprise correlation matrix for three samples, overall, small bank and large bank samples. First row in each cell represents correlation based on overall sample, second row represent small sample and third row is for large sample

The results for panel unit root are presented in table 5. Prior the panel data analysis is necessary to check all variables whether are stationary or not. Because estimating non stationary variables may lead to pseudo results (Sims, 1980) as cited from (Karakaya & Er, 2013). There are different types of panel unit root test such as Levin-Lin-Chu test (LLC), Im-Pesaran & Shin test (IPS), Breitung's test, Fisher-type test and Residual based LM test. There is no dominant performance between these tests. The choice would depend on assumptions, benefit and limitation for each. LLC is said to have high power if time dimension is large however its major limitation is to assume all cross section units have a unit root in a null hypothesis. Whereas IPS it less restrictive because it allows heterogeneous coefficients. On the other hand Fisher-type test is said to outperform IPS with respect to size adjustment. Breitung's test use same procedure as LLC but doesn't include deterministic trend because it reduces the power of all test considerably. Therefore this study has considered LLC panel unit root test because sample was split into groups of banks with similar features hence the assumption that all cross section units have a unit root did not matter.

The table shows none of the variables were non stationary across all subsamples except INFL found not stationary at level across all subsamples. The study found variables that were found not stationary at level in a particular sample found to be stationary in first difference. Therefore all variable were included in the model after correction of unit root problem by taking first difference to avoid spurious regression.

Table 5: PANEL UNIT ROOT TEST

|                  | SMALL     | LARGE     | FOREIGN   | DOMESTIC  | PRIVATE  | PUBLIC     | STATIONARY                    |
|------------------|-----------|-----------|-----------|-----------|----------|------------|-------------------------------|
| SHROA            | -8.7786*  | -2.1283** | -8.3628*  | -2.0997** | -8.2172* | -2.2107*   | AT LEVEL                      |
| SHROE            | -7.3240*  | 4.4252*D  | -4.0664*  | -3.3272*  | -4.8322* | -3.6521*   | AT LEVEL EXCEPT<br>IN LARGE   |
| <b>NONIs</b>     | -3.6503*  | -4.1314*  | -4.5554*  | -3.3339*  | -5.3609* | -2.1276*   | AT LEVEL                      |
| <b>NINs</b>      | -3.6503*  | -4.1314*  | -4.5554*  | -3.3339*  | -5.3609* | -2.1276**  | AT LEVEL                      |
| <b>DIV</b>       | -2.6455*  | -3.1081*  | -3.3956*  | -2.3645*  | -4.5774* | 16.631**pp | AT LEVEL                      |
| <b>LNTAST</b>    | -3.1792*  | -5.4192*  | -3.0988*  | -5.6094*  | -6.2601* | -7.6494*D  | AT LEVEL EXCEPT<br>IN PUBLIC  |
| <b>EQTY/TAST</b> | -6.3958*  | -2.1998** | -5.9534*  | -3.1144*  | -6.7261* | 16.808**pp | AT LEVEL                      |
| <b>TLON/TAST</b> | -4.1658*  | -2.9052*  | -5.0908*  | -2.0162** | -5.6229* | -4.6152*D  | AT LEVEL EXCEPT<br>IN PUBLIC  |
| <b>INFL</b>      | -17.8784* | -11.353*  | -16.818*  | -12.6929* | 19.300*  | -8.028*    | 1ST DIFFERENCE                |
| <b>GDPGR</b>     | -4.1152*  | -2.4164*  | -3.8702*  | -2.7016*  | -4.5657* | -1.7087**  | AT LEVEL                      |
| <b>TAST/GDP</b>  | -9.5246*  | -4.1045*  | -8.6295*D | -3.9922*  | -3.3950* | 21.575*pp  | AT LEVEL EXCEPT<br>IN FOREIGN |

\* and \*\* show that LLC statistic is statistical significant at 0.01 and 0.05 respectively  
pp indicates Fisher-PP test at level. D indicates LLC statistics but at 1<sup>st</sup> Difference

*Note: Exceptional cases where variables were found not stationary due to low power LLC due to small sample size especially Public banks sample then Fisher-PP was used.*

### **Regression findings of risk adjusted return on asset**

Table 6 below represents regression findings on bank performance measured by risk adjusted return on assets against noninterest income across all subsamples. The estimation was conducted using both FEM and REM depicted on equation 6 and 7. However, only FEM results are reported because Hausman test result indicates FEM to be appropriate. At 1% significant level F statistic for across all samples found to be significant which signifies the relevance of the model. Moreover a result indicates independent variables explain in a range of 57% to 82% of a total change in risk adjusted return on assets.

The table shows noninterest income has a significant negative impact on risk adjusted return on asset across all subsamples. This is ascertained at 1% significant level for all subsamples except large bank sample which is significant at 5%. Besides, the magnitude of impact differs depending on the type of bank. Small banks found to be highly affected than large banks i.e. that a unit change of noninterest income lead a decrease of 4.4 in small banks and 3.9 in large to a return on assets. On the other hand domestic banks is as twice negatively affected by increase in noninterest income activities compared to foreign banks i.e. a unit change in noninterest income lead to almost 6 unit decrease of risk adjusted return on assets for domestic banks compared to 2.9 units decrease of risk adjusted return on assets for foreign banks. In addition public banks found to be highly affected by the noninterest income than private banks.

Besides the table indicates diversification is positively related to return on asset. This confirms the hypothesis number two. This is in line with diversification theory stipulating a stable return for negatively correlated activities. However this was more significant to a small banks sample where a unit change in diversification led to a 3.4 units increase in return on assets. These results imply that the focus to noninterest income should be limited and encourage balanced participation on both noninterest income activities and interest income activities. The results on net interest income not reported on table because are similar to that of noninterest income with exception on direction of impact. Using same regression model interest income found to have positive impact on risk adjusted return with the same magnitude to that of noninterest income. This results were not a surprise because correlation matrix presented on table 4 already depicted a perfectly negatively correlation among the two.

Table 6: The panel data analysis findings of risk adjusted return on assets

|                        | SHROA<br>SMALL | SHROA<br>LARGE | SHROA<br>FOREIGN | SHROA<br>DOMESTIC | SHROA<br>PRIVATE | SHROA<br>PUBLIC |
|------------------------|----------------|----------------|------------------|-------------------|------------------|-----------------|
| NONIS                  | -4.3677***     | -3.8996**      | -2.8515***       | -5.9565***        | -3.0185***       | -5.7204***      |
| DIV                    | 3.3786**       | 3.2369         | 2.2513           | 3.5236            | 2.3163           | 5.6862          |
| TAST_GDP               | -56.987        | 57.297**       | 50.363           | 24.8639           | -                | -275.97         |
| INFL                   | -              | 0.0465         | -                | 0.0241            | 0.0042           | 0.0526          |
| TLON_TAST              | -              | -1.9135        | 1.2873           | -0.8764           | 1.1363*          | -0.2953         |
| LNTAST                 | 0.1614*        | -1.2881***     | 0.0759           | -0.1909           | 0.0207           | 1.543           |
| GDPGR                  | 0.3818***      | -              | 0.1763           | 0.4709**          | 0.2167           | 0.8649**        |
| EQTY_TAST              | -              | 28.5995***     | 1.1413           | -                 | -0.9389          | 1.5091          |
| C                      | -5.5445*       | 33.546***      | -2.3406          | 4.0724            | -0.8085          | -2.8483         |
| <b>DIAGNOSTICS</b>     |                |                |                  |                   |                  |                 |
| R <sup>2</sup>         | 0.7305         | 0.8244         | 0.736338         | 0.8117            | 0.7946           | 0.5782DW        |
| F-statistic            | 18.97***       | 21.799***      | 16.889***        | 22.357***         | 25.938***        | 3.489***        |
| Hausman statistic      | 2.1044         | 55.598***      | 3.9511           | 0.0000            | 0.0000           | N/A             |
| Model Reported         | FEM            | FEM            | FEM              | FEM               | FEM              | FEM             |
| Cross section included | 17             | 8              | 15               | 10                | 21               | 4               |
| Total observation      | 169            | 80             | 149              | 100               | 209              | 40              |

Note \*, \*\* and \*\*\* show the statistical significance levels at 0.10, 0.05 and 0.01 respectively

### Regression findings of risk adjusted return on equity

The panel data analysis of risk adjusted return on equity is presented in Table 7. F statistic is significant across all subsamples. It also indicates that independent variables were able to explain changes in risk adjusted return on equity in the range of 46% to 76% depicted by R-squared score. Table shows increased share of noninterest income has a negative impact on risk adjusted return on return on equity. However results found to be more significant to small banks, private banks and foreign banks. But results indicate insignificance to large banks, public banks and domestic banks. This is contrary to regression results on risk adjusted return on assets indicated in table 6 where significance was ascertained to all types bank.

On the other hand table 7 show that diversification has a positive impact on risk adjusted return on equity but only significant to small banks, private banks and foreign banks. This also implies diversification is more desirable than a focus to noninterest income activities. The interest income activities found to have positive impact to risk adjusted return on equity with the same magnitude of that of noninterest income this is because there is a perfect negative correlation between these two sources of income reported in table 4.

Table 7: The panel data analysis findings of risk adjusted return on equity

|                           | SHROE     | SHROE     | SHROE      | SHROE     | SHROE      | SHROE    |
|---------------------------|-----------|-----------|------------|-----------|------------|----------|
|                           | SMALL     | LARGE     | FOREIGN    | DOMESTIC  | PRIVATE    | PUBLIC   |
| NONIS                     | -4.613*** | -3.3253   | -4.5251*** | -1.9545   | -4.4534*** | -2.8378  |
| DIV                       | 5.4137*** | 4.626     | 4.3997**   | 3.9197    | 5.4644***  | 7.1399*  |
| TAST_GDP                  | -58.983   | 49.878*   | 93.565***  | -51.378** | -          | -186.596 |
| INFL                      | -0.0056   | 0.0465    | -          | 0.00094   | 0.0103     | 0.0213   |
| TLON_TAST                 | -0.2946   | -2.9729** | -          | 0.6046    | -0.7403    | 0.9003   |
| LNTAST                    | 0.1895*   | -1.334*** | 0.1680     | -0.03799  | -          | 1.4397   |
| GDPGR                     | 0.2674*   | -         | 0.2000     | 0.3087    | 0.2831**   | 0.2631   |
| EQTY_TAST                 | -0.9107   | 10.69*    | -          | -         | -1.5482*   | -0.8907  |
| C                         | -6.0529*  | 36.356*** | -4.699     | 0.0122    | -0.6324    | -0.4799  |
| <b>DIAGNOSTICS</b>        |           |           |            |           |            |          |
| R <sup>2</sup>            | 0.6945    | 0.7458    | 0.760914   | 0.7588    | 0.758      | 0.4636DW |
| F-statistic               | 13.64***  | 13.62***  | 21.61***   | 16.32***  | 21.93***   | 2.2001** |
| Hausman<br>statistic      | 4.956667  | 0.000     | 2.595645   | 21.496733 | 0.0000     | N/A      |
| Model<br>Reported         | FEM       | FEM       | FEM        | FEM       | FEM        | FEM      |
| Cross section<br>included | 17        | 8         | 15         | 10        | 21         | 4        |
| Total<br>observation      | 169       | 80        | 149        | 100       | 209        | 40       |

Note \*, \*\* and \*\*\* show the statistical significance levels at 0.10, 0.05 and 0.01 respectively

## CONCLUSION

This study investigated the impact of non interest income on bank performance in Tanzania. The proxies used to estimate performance were risk adjusted return on assets and risk adjusted return on equity. The analysis considered the presence of different types of banks in the sector i.e. small banks, large banks, domestic and foreign banks, public and private banks. The study used a sample of 25 banks out of 49 and fixed effect panel regression model (FEM). The findings indicated that increase in share of noninterest income has negative impact on bank performance across all types of banks. Similarly results support the hypothesis that diversification is better for the performance of the bank than focusing on non interest income activities. However, small banks, domestic banks and public banks are highly affected especially in risk adjusted return on equity.

On the other hand study found a share of net interest income to have positive impact on performance, however focus on interest income activities in this modern age might not be viable because of the existing challenges i.e. improved technology, competition, interest forbidden society, regulation etc making difficult to rule out noninterest income activities. Therefore

diversification might be the best alternative because findings confirmed hypothesis that diversification is good for the banking sector performance in Tanzania. The findings are beneficial to bank managers, regulators and supervisors in ensuring sustainable banking sector performance.

The study considered only profitability measures as a proxy for bank performance, so future research should consider cost efficiency of non interest and interest income activities in Tanzanian banking sector.

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## APPENDIX

### LIST OF BANKS USED IN THE STUDY

| S/N | BANK NAME | SIZE <sup>a</sup> | ORIGIN <sup>b</sup> | OWNERSHIP <sup>c</sup> |
|-----|-----------|-------------------|---------------------|------------------------|
| 1   | ABC       | Small             | Foreign             | Private                |
| 2   | AKIBA     | Small             | Domestic            | Private                |
| 3   | AZANIA    | Small             | Domestic            | Private                |
| 4   | BARCLAYS  | Large             | Foreign             | Private                |
| 5   | BOA       | Small             | Foreign             | Private                |
| 6   | CBA       | Small             | Foreign             | Private                |
| 7   | CITIBANK  | Large             | Foreign             | Private                |
| 8   | CRDB      | Large             | Domestic            | Private                |
| 9   | DCB       | Small             | Domestic            | Private                |
| 10  | DIAMOND   | Small             | Foreign             | Private                |
| 11  | EXIM      | Large             | Domestic            | Private                |
| 12  | FBME      | Small             | Foreign             | Private                |
| 13  | HABIB     | Small             | Foreign             | Private                |
| 14  | I & M     | Small             | Foreign             | Private                |
| 15  | ICB       | Small             | Foreign             | Private                |
| 16  | KCB       | Small             | Foreign             | Private                |
| 17  | NBC       | Large             | Foreign             | Private                |
| 18  | NIC       | Small             | Foreign             | Private                |
| 19  | NMB       | Large             | Domestic            | Private                |
| 20  | PBZ       | Small             | Domestic            | State                  |

|    |                    |       |          |         |
|----|--------------------|-------|----------|---------|
| 21 | STANBIC            | Large | Foreign  | Private |
| 22 | STANDARD CHARTERED | Large | Foreign  | Private |
| 23 | TIB                | Small | Domestic | State   |
| 24 | TPB                | Small | Domestic | State   |
| 25 | TWIGA              | Small | Domestic | State   |

<sup>a</sup> Banks size is described based asset size. Banks reported average total assets less than 300bn for the period of 2002 to 2012 were considered as small banks. Otherwise it was a large bank.

<sup>b</sup> All subsidiary banks of MNBs are considered as foreign banks while locally established banks as domestic banks

<sup>c</sup> Banks with more than 50% government ownership are considered state owned otherwise Private