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# DETERMINANTS OF FOREIGN EXCHANGE RISKS IN COMMERCIAL BANKS; A CASE OF SELECTED BANKS IN IRINGA

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**KeyWords:** Foreign Exchange Risks, Transaction Exposure, Economic Exposure, Translation Exposure.

## ABSTRACT

The purpose of the study was to examine the determinants of foreign exchange risks in commercial banks in Tanzania, namely EXIM, NMB, NBC and CRDB Bank in Iringa municipality. Specifically, the study intended to examine the effect of transaction exposure, economic exposure and translation exposure on foreign exchange risk in commercial banks in Iringa municipality. This was a case study design whereby the research employed quantitative research approach to gather data and answer the research problem and summarize the results. A sample size of 36 observations was taken from selected commercial banks in Iringa municipality. Stratified random sampling technique was used for the selection of respondents. Linear Regression using Ordinary Least Square Estimator was used for data analysis. The study revealed that transaction exposure, translation exposure and economic exposure have positive relationship with foreign exchange risk. T-tests show that transaction exposure, translation exposure and economic exposure have significant impact on foreign exchange risk with p-value less than 0.05. Moreover, the regression result shows that all variables have a significance relationship with foreign exchange risk in commercial banks in Iringa Municipality. The co-efficient of determination, the adjusted R<sup>2</sup>, is to 0.545, which shows that the independent variables explain about 54.5% of the variation in the dependent variable. The study concludes that foreign exchange risk is caused by inter alia, transaction exposure, translation exposure and economic exposure. The study recommends that, there is a need therefore for commercial banks in Iringa Municipality to use effectively these determinants in managing foreign exchange risks. The study also recommends that despite concerns that foreign exchange among commercial banks entail new market risks that need regulatory intervention, However, market risk does vary considerably across the banks; therefore, more efforts should be putted on the use of transaction exposure, translation exposure and economic exposure in managing foreign exchange risks in commercial banks.

## INTRODUCTION

Foreign exchange risk is the likelihood that unexpected change in exchange rates will alter the home currency value if foreign currency cash payment and receipts are expected from a foreign source. For instance, a sudden depreciation of one currency against the other can increase the cost of servicing an obligation especially for business whose input resources are imported. Taggart and McDermott (2015) assert that forex related firms are subject to foreign exchange risk on the payables and receipts in foreign currencies. They define foreign exchange risk management as a program of assessment (identification and quantification) and counterstrategies to mitigate exchange rate risk and save firm's economic value. Kirt (2015) further adds that foreign exchange risk is a financial risk management intended to manage value creation and loss prevention in a firm by internal and external financial tools.

Foreign exchange risk arises when fluctuation in the relative values of currencies affects the competitive position or viability of an organization (Featherson, et al., 2016). If financials of a firm's project are exposed to forex risk, then they depend on unanticipated exchange rates changes. Generally, companies are exposed to transaction exposure, economic exposure and translation exposure (El-Masry, 2016; Salifu et al, 2017).

Transactional exposure arises from future cash flows and where the value of existing obligations is affected by changes in forex rates. Economic exposure relates to adverse impact on entity income for both domestic and foreign operations because of sharp, unexpected change in exchange rate. Translation exposure occurs through currency mismatch and it is related to assets or income derived from offshore enterprise (Madura, 2017).

Forex risk comes about as a disparity between the assets held by a bank and the loans that fund its financial position. An unex-

pected depreciation of the local currency against the USD, for instance, can dramatically increase the cost of servicing debt relative to revenues. The creditworthiness of the bank (hence the ability to raise new funds) can also be negatively affected and even generate a negative net revenue which affects the long-term financial stability of the bank (Moles, 2018). Banks are more vulnerable to forex risk in developing countries where the risk of currency depreciation is high. Forex risk management practices differ among banks depending on aspects such as the bank size, the nature and complexity of its activities. However, a broad forex risk plan should deal with at least good management information systems, contingency planning, and other managerial and analytical techniques.

Tanzania, being among the most open countries in the world in terms of international trade reflects the degree of Tanzania's exposure to foreign exchange risk. Foreign exchange risk in this case arises due to fluctuating exchange rates. Moreover, exchange rate variability is a source of cash flow risk for firms with foreign denominated assets and liabilities as well as firms with overseas operations (Salifu et al., 2017). The exchange rate is an important trade related instrument in that it directly affects the prices of exports and imports. In simple terms an appreciation of the exchange rate increases the prices of Tanzanian exports, damaging competitiveness and decreases the price of imports; a depreciation of the exchange rate has the opposite effect. According to BoT report (2018), the exporter faces two kinds of foreign exchange risks. The first is the risk of depreciation of the foreign currency in which an exporter has invoiced the export contract. If the currency depreciates, the exporter would receive less money in the home currency. The second is the risk of appreciation of the foreign currency in which the exporter holds a due. This would affect the exporters' product making it more expensive abroad.

Moreover, Abor (2019) asserts that foreign exchange fluctuations expose companies to foreign exchange risk. What originally seemed a profitable venture could turn out to be a loss due to exchange rate fluctuations. Such risks are quite common in international trade and in financial institutions as well. We have seen a lot of volatility with the Tanzanian Shilling recently, resulting into uncertainty to those with foreign exchange exposure as a result. According to BoT report (2018), the Bank of Tanzania participated in the market for liquidity management purposes, and sold USD 83.0 million. The Shilling depreciated against the USD by 0.5 percent, trading at an average rate of TZS 2,330.3 per USD in March 2018, from TZS 2,325.8 per USD in the preceding month. On annual basis, the Shilling depreciated by 4.5 percent from an average of TZS 2,290.4 per USD recorded in March 2017.

In this respect, exchange rate volatility creates a risky business environment in which there are uncertainties about future profits and payments. These are especially exacerbated in countries where financial instruments for hedging against foreign exchange risk are not developed, which is the case in many developing countries, including Tanzania (World Bank, 2020).

The problems in the Tanzanian banking industry emanates from their nature of target customers and the informal system of operations. The rapid increase in private sector makes foreign currency risk practices an important topic for commercial banks. A very large percentage of cross-border, fixed-income investments are denominated in foreign currencies (meaning currencies other than the currencies in which the banks are operating), leaving banks with significant foreign exchange exposure. During the recent American financial crisis, some banks that depend on foreign currency-denominated debt for their business suffered hefty forex losses that threatened their overall viability (Littlefield and Kneiding, 2019).

There are many effects of foreign exchange risk in commercial banks, not only in lower middle income countries but also in the higher income countries. Similar studies such of Ubindi (2016); Marshall, (2010); and Hommel, (2015) on foreign exchange risk in commercial banks have been done in Tanzania and found that commercial banks uses forward contracts (most frequently used), money market hedge, currency swap, and currency option to mitigate foreign exchange risk when commercial banks are more affected with transaction, translation and economic exposures. On the other hand, the financial markets differ from country to country whereby financial procedures cannot be equally applied. In regards to the currency volatility, appreciation and depreciation of the Tanzanian shilling against the USD in light of the sophisticated nature of conventional foreign exchange risk management techniques, no concrete studies focused on the risk management in Tanzania. For that matter, this compelled the researcher to examine the determinants of foreign exchange risks in commercial banks in Tanzania taking Iringa based banks as a case.

## LITERATURE SURVEY

### The Effects of Transaction Exposure on Foreign Exchange Risk in Commercial Banks

Omagwa (2015) studied on "Foreign Exchange Risk Management Practices by Foreign Owned Commercial Banks in Kenya". The study involved commercial banks with 10 years of observation. A time series data was employed whereby descriptive analysis was used in data analysis. The study found that most banks consider credit/default risk to be the most critical of all the financial risks, foreign exchange risk is the most critical risk for most firms. For most banks, foreign exchange risk management systems are governed by guidelines set by at head office (highly centralized foreign exchange risk management systems). Most banks, regardless of their size, extensively utilize most of conventional hedging instruments. Transaction exposure was rated as the most critical to most banks when compared to translation and economic exposures. Some hedging practices were considered by most banks to be more important than others; foreign currency option and forward contracts were most frequently used; natural hedging/ matching strategy, leading and lagging were also used. Most banks preferred the selective hedging strategy as compared to hedging all open positions immediately.

Ubindi (2016) studied on "Foreign Exchange Risk Management by Forex Bureaus in Tanzania". The study employed a case study design and three banks were involved with 10 years of observation. A descriptive analysis was used in data analysis. The study found that transaction exposure was rated as most critical compared to others. Transaction exposure was through buying and selling foreign currencies, cross currency dealings and investing and financing in foreign currencies. The US dollar, sterling pound and Euro were currencies that were greatly traded and thus had the greatest contribution to foreign exchange risk. The foreign exchange risk management practices they used to mitigate foreign exchange risk were forward contracts (most frequently used), money market

hedge, currency swap, and currency option. Most forex bureaus indicated that their foreign exchange risk management systems were governed by guidelines set by the Central Bank of Tanzania as well as their individual decisions.

Hudon (2006) studied on "Risk Management and Financial Performances of Microfinance Institutions in UK". A case study was employed and four financial institutions were included. Primary data were collected from 36 respondents whereby descriptive analysis was used in data analysis. The study found that financial institutions including MFI's still exhibit better management ratings. The technical, organizational and communication competencies of top managers are the most important management dimensions to explain all financial results. Under this dimension of management, the professional skills of top managers must be emphasized. Therefore the institutions were effective in risk management performance.

The Effects of Translation Exposure on Foreign Exchange Risk in Commercial Banks

Marshall (2010) conducted a study on "The Effects of Industry Growth Structure on Translation Exposure in Commercial Banks in Tanzania". A survey study was conducted and four banks were observed. Primary data was collected from 50 respondents whereby descriptive analysis was used in data analysis. The study points out that currency swaps are better for hedging against translation risk, while forwards are better for hedging against transaction risk. This study also provides subjective evidence that pricing policy is the most popular means of hedging economic exposures. These results however can differ for different currencies depending in the sensitivity of that currency to various market factors. Regulation in the foreign exchange markets of various countries may also skew such results.

Bennet (2013) studied on "Bank Share Prices and Profit Stability in Sydney". The study employed a case study survey and three banks were included for 6 months. Primary data was collected from 45 respondents whereby descriptive analysis was used in data analysis. The study found that the structure of the translation exposure is related to the accounting principles used in the company. However, survey results have indicated that it is often being hedged. Hedging by the existence of management compensation schemes which are often tied to financial statements are affected by translation gains and losses. From the point of view of foreign exchange exposure management often a more practical way of differentiating among exposure types is to divide them into contractually based and forecasted exposures. In this way the focus is on real future exposures and the usefulness of this will become apparent in calculating foreign exchange exposure positions.

Siraji (2014) conducted a study on "Tanzania's Foreign Exchange Risk Management in Commercial Banks". The study was exploratory and descriptive research design was used whereby four banks were studied. Primary data was collected from 45 respondents for 3 months and descriptive analysis was used in data analysis. Based on the findings, commercial banks under study indicated translation exposure was the most common amongst the banks. As per the all current rate method, all assets and liabilities are translated at the rate in effect on the balance sheet date and all items on the income statement are translated at an appropriate average exchange rate or at the rate prevailing when the various revenues, expenses, gains and losses were incurred. Some of the executives interviewed were of the opinion that the all current rate method eliminates the variability of net earnings due to translation gains or losses and the relative proportions of individual balance sheet accounts remain the same. Economic exposure is rarely covered and most of the respondents felt that the key determinant of economic exposure is the competitive structure of the firm in which it operates. Even the companies which do not have any foreign subsidiary are also facing translation exposure because of their foreign currency assets and liabilities.

The Effects of Economic Exposure on Foreign Exchange Risk in Commercial Banks

Ahmed (2017) studied on "Microfinance: Realizing the Social Role of Islamic Finance in Arabic Nations". Cross-sectional study was employed and three banks were examined for 5 months. Data were collected from 36 respondents whereby regression analysis using Ordinary Least Square Estimator technique was used in data analysis. The study found that microfinance banks has to create various reserves to cover various risks arising due to the nature of its assets and liabilities since assets and liabilities has a positive relationship to risk management in microfinance. Some observations and suggestions stated that risk management has become more important now and its importance will continue to grow in the future. Factors such as the increasing competition in markets and the integration of new technology into the industry further reinforce the importance of risk management in banks. However, it is disturbing to note that systematic risk management is still not as widespread as it should be.

Wanjohi (2013) did a study on "The Effect of Financial Risk Management on the Financial Performance of Commercial Banks in Kenya". To assess the financial risk management practices, a self-administered survey questionnaire was used across five banks. Data were collected from 2008-2012 whereby regression analysis using Ordinary Least Square Estimator technique was used in data analysis. Return on Assets (ROA) was averaged for five years (2008-2012) to proxy the banks' financial performance. The study found out that majority of the Kenyan banks were practicing good financial risk management and as a result the financial risk management practices mentioned herein have a positive correlation to the financial performance of commercial banks in Kenya.

Hommel (2015) studied on "Governing the Corporate Risk Management Function; Risk Management in Scandinavian". A case study research design was employed and three commercial banks were involved. Primary data were collected from 75 respondents whereby descriptive analysis was used in data analysis. The study found that foreign exchange rate changes on the competitive environment consider a company with a foreign subsidiary. In the case that the exchange rate of the local currency of the subsidiary changes it will affect the costs of its production factors and thus the margins on its outputs. Should the subsidiary have a foreign competitor whose production factors and thus margins were not affected by the parity shift then the competitive position between the two competitors has changed. The effects, however, continue as the net profits of the subsidiary are transferred to its parent company. To put it simply parity changes in currency pairs can affect the competitive position of subsidiaries, their net profits converted to home currencies of parent companies. It is also noteworthy that virtually every company irrespective of whether it is involved in foreign trade or not has economic exposure. As a simplification, however, economic exposure can be thought of as future

cash flows that are exposed to potential currency exchange rate changes that will eventually, when they are identifiable, change into transaction exposures.

## METHODOLOGY

This was a case study design whereby the research employed quantitative research approach to gather data and answer the research problem and summarize the results. A sample size of 36 observations was taken from selected commercial banks in Iringa municipality. Stratified random sampling technique was used for the selection of respondents. Linear Regression using Ordinary Least Square Estimator was used for data analysis.

## RESULTS & DISCUSSION

### Multiple Regression Analysis

Multiple regression linear analysis was also conducted to examine how multiple independent variables (transaction exposure, economic exposure and translation exposure) are related to the dependent variable (Foreign exchange risk) whereby 36 observations were used. According to Weiers (2015), a multiple regression analysis is an analysis that involves one dependent variable and two or more independent variables. In other words, it is an analysis of association in which the effects of two or more independent variables on a single, interval-scaled dependent variable are investigated simultaneously (Zikmund, 2015).

### The Economic Theory Test Analysis

Similar studies such of Ahmed, (2017) and Wanjohi (2013) used multiple regression analysis by using ordinal least square estimator as a technique to analyze causal relationship between variables. Thus, the model used, as shown from the conceptual model, was linear regression;

That is

$$FXR = f(TSE, TLE, ECE)$$

Where,

FXR = Foreign Exchange Risk; TSE= Transaction Exposure; TLE= Translation Exposure; and ECE= Economic Exposure  
And

$$dFXR/(d TSE) > 0, dFXR/(d TLE) > 0, dFXR/(d ECE) > 0,$$

$$\text{The estimated linear model was } FXR = 6.992 + 0.623TSE + 0.647TLE + 0.732ECE$$

$$(9.087) \quad (3.874) \quad (4.281) \quad (4.965)$$

$R^2 = 0.545$ ,  $F = 22.545$ , and  $t$  values are in parentheses

Table 1: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	T	
1	(Constant)	6.992	7.673			9.087
	Transaction exposure	.623	.560	.440	3.874	.002
	Translation exposure	.647	.562	.555	4.281	.000
	Economic exposure	.732	.688	.536	4.965	.000

### a. Dependent Variable: Foreign Exchange Risk

The estimated regression model indicates that a one percentage increase in transaction exposure leads to a positive change of 0.623 in foreign exchange risk. A one percentage change in translation exposure leads to a positive change of 0.647 in foreign exchange risk. A unit change in economic exposure leads to a positive change of 0.732 in foreign exchange risk. All three parameter estimates are statistically significant at 5% level. Moreover, all algebraic signs of the parameter estimate for transaction exposure, translation exposure and economic exposure conform to the hypothesized signs.

### T-Statistical Test

The t-statistics are greater than 2.0 in absolute terms. Therefore, according to the rule of thumb, parameter estimates are statistically significant, thus they determine foreign exchange risk in commercial banks.

Table 2: Analysis of Variance – ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	43.334	2	42.111	22.545	.006 <sup>b</sup>

Residual	67.156	33	12.044
Total	110.490	35	

a. Dependent Variable: Foreign exchange risk

b. Predictors: (Constant), Transaction exposure, Translation exposure, Economic exposure

#### Interpretation

This was used to test the overall significance of the regression results.

The hypothesis is:

HO:  $\beta_1 = \beta_2 = \beta_3 = 0$  (model insignificant)

HA:  $\beta_1 \neq \beta_2 \neq \beta_3 \neq 0$  (model is significant)

The level of significance is 5% = 0.05 with 95% confidence interval.

The calculated 'F' as shown in Table 4.2 is 22.545 and the critical F-value (from tables) is 3.15

Since the calculated 'F' is greater than critical 'F', the researcher rejects null hypothesis in favor of the alternative hypothesis; that is,  $\beta_1$ ,  $\beta_2$  and  $\beta_3$  are statistically different from zero implying that transaction exposure, translation exposure, and economic exposure determines foreign exchange risk in commercial banks.

Table 3: Model Explanatory Power

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.873 <sup>a</sup>	.674	.545	7.20916	.474	22.545	2	33	.006

a. Predictors: (Constant), Transaction exposure, Translation exposure, Economic exposure

b. Dependent Variable: Foreign exchange risk

#### Interpretation

This test was used to explain the total variations in the dependent variable i.e. foreign exchange risk caused by variations in the independent variables i.e. transaction exposure, translation exposure and economic exposure. In the case of the regression output the adjusted R<sup>2</sup> = 0.545, implying that the model explains about 54.5% of variations in the foreign exchange risk hence the model does half in explain variations in foreign exchange risk.

Also, R coefficient is 0.873 meaning that there is a correlation of 87.3% between the independent variables (transaction exposure, translation exposure, economic exposure) and dependent variable (foreign exchange risk). This shows that the independent variables (transaction exposure, translation exposure, economic exposure) are significant predictors of the dependent variable (foreign exchange risk) in commercial banks in Iringa Municipality.

## FINDINGS BASED ON THE SPECIFIC OBJECTIVES

### The Effect of Transaction Exposure on Foreign Exchange Risk in Commercial Banks in Iringa Municipality

From the study it was revealed that transaction exposure has a positive and significance effect on foreign exchange risk since the p-value was less than 0.05. If transaction exposure is well used by commercial banks, the banks will be more likely to manage foreign exchange risks effectively. The higher the magnitude of using transaction exposure well, the higher foreign exchange risk management by commercial banks; therefore, transaction exposure determines foreign exchange risk in commercial banks in Iringa Municipality.

The findings in this study are similar to the study done by Omagwa (2015) who found that most banks consider credit/default risk to be the most critical of all the financial risks, foreign exchange risk is the most critical risk for most firms. For most banks, foreign exchange risk management systems were governed by guidelines set by at head office (highly centralized foreign exchange risk management systems). Most banks, regardless of their size, extensively utilized most of conventional hedging instruments. Transaction exposure was rated as the most critical to most banks when compared to translation and economic exposures.

Therefore, findings show that there is a positive relationship between transaction exposure and foreign exchange risk and the p-value was less than 0.05.

### The Effect of Translation exposure on Foreign Exchange Risk in Commercial Banks in Iringa Municipality

The study revealed that translation exposure has positive and statistically significance effect on the foreign exchange risk since the p-value was less than 0.05. Having the foreign subsidiaries or other real assets in foreign countries increases the risk of foreign exchange because the financial statements of foreign subsidiaries, which are stated in foreign currency, are converted into the parent company's reporting currency, for the company to prepare consolidated financial statements. Therefore, translation exposure determines foreign exchange risk in commercial banks if well managed for instance using currency swaps.

These findings are related with Siraji, (2014) who found that commercial banks under study indicated translation exposure was the most common amongst the banks. As per the all current rate method, all assets and liabilities are translated at the rate in effect on the balance sheet date and all items on the income statement are translated at an appropriate average exchange rate or at the rate prevailing when the various revenues, expenses, gains and losses were incurred. Some of the executives interviewed were of the opinion that the all current rate method eliminates the variability of net earnings due to translation gains or losses and the relative proportions of individual balance sheet accounts remain the same. Even the companies which do not have any foreign subsidiary are

also facing translation exposure because of their foreign currency assets and liabilities.

Therefore, findings show that there is a positive relationship between translation exposure and Foreign exchange risk and the p-value was less than 0.05.

#### The Effect of Economic Exposure on Foreign Exchange Risk in Commercial Banks in Iringa Municipality

The study revealed that economic exposure is positive significance related to the foreign exchange risk since the p-value was less than 0.05. Economic exposure measures any change in the present value, of a company, resulting from changes in the future operating cash flows caused by any unexpected change rates. The study finds that there is a positive and strong significant relationship between economic exposure and foreign exchange risk in commercial banks. Currency fluctuations affect the commercial banks future sales volumes, prices and costs, cause the change in value. Therefore, economic exposure determines foreign exchange risk in commercial banks in Iringa Municipality.

These findings are similar to the study done by Ahmed, (2017) who found that microfinance banks has to create various reserves to cover various risks arising due to the nature of its assets and liabilities since assets and liabilities has a positively relationship to risk management in microfinance. Some observations and suggestions stated that risk management has become more important now and its importance will continue to grow in the future. Factors such as the increasing competition in markets and the integration of new technology into the industry further reinforce the importance of risk management in banks.

Therefore, findings show that there is a positive relationship between economic exposure and foreign exchange risk and the p-value was less than 0.05.

## Conclusion

Transaction exposure, translation exposure and economic exposure have significant effect on foreign exchange risk as indicated by regression results. Therefore, foreign exchange risk is caused by inter alia, transaction exposure, translation exposure and economic exposure.

## RECOMMENDATIONS

### Recommendations for Action

The study recommends that there is a need for commercial banks in Iringa Municipality to use effectively these determinants in managing foreign exchange risks as explanatory variables showed that they all have a positive relationship and significant effect on managing foreign exchange risks.

The study also recommends that despite concerns that foreign exchange among commercial banks entail new market risks that need regulatory intervention, the profitability and generally performance of the commercial banks has not changed so much. However, market risk does vary considerably across the banks; therefore, more efforts should be putted on the use of transaction exposure, translation exposure and economic exposure in managing foreign exchange risks in commercial banks.

### Recommendations for Further Studies

The study suggests that other studies should be done on other independent variables that affects foreign exchange risks in commercial banks using different models and estimation techniques, as the study variables explains only 54.5% of the model. All the aspects of foreign exchange risks in the banking sector should be studied so that better results can be obtained.

This study covers a shorter period and few commercial banks in Iringa Municipality. A study should be done covering a longer period which may give different results from the ones obtained in this study. Also, Moreover, other studies should be done in other regions or municipality on determinants of foreign exchange risks in commercial banks.

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