

Non-interest Income, Profitability and Risk of Commercial Banks in Bangladesh

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Abstract: *Commercial banks are diverting from core banking to non-interest income business with the advancement of technology. The study has been conducted to find out the relationship of non-interest income, profitability and risk of 10 commercial banks which have been listed in DSE in Bangladesh from 2012 to 2017. Size of the firm, interest income, customer deposits, risk exposure, liquidity, capital adequacy ratio, inflation rate, prime rate and off balance sheet amount have been considered as independent variables for the study model and non-interest income has been considered as the dependent variable for the study. The Stata-12 software has been used for analyzing and testing the data. The finding of the study is that risk exposure, liquidity of the bank, inflation of the economy and prime rate have positively influenced on non-interest income. Customer deposit is negatively related with the non-interest income of the bank. ATM services, online shopping, bill payment services, off balance sheet activity and other fees generating activity are going more popular sources of income for the bank to sustain in the competitive market. Non-interest income has positive relation on profitability and has also positive impact on risk. Due to the off balance sheet activity, banks are facing more risk and they put more provisions for off balance sheet activity. Provision for loan losses and other provisions decrease the firm's profitability as well as firm's financial stability.*

Key Words: Non-interest income, off balance sheet activity, Commission, Risk exposure, Liquidity.

1.0 Introduction

Banking business is a financial business that deals with money. Banks collect the fund from the surplus units and provide that fund to the deficit units in the society. Bank earns the interest spread from borrowing and lending activities. Bank is an institution which makes bridge between the deficit unit and surplus unit. Banks are collecting fund from surplus units and lends to the deficit units with higher interest rate. The interest spread is the earnings of the bank for doing core banking activity. Bank's profitability depends on the lending of the deposited fund. The core activity

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of the bank is collecting fund and lending to make profit from the operation. In Bangladesh, banks are operating under the Banking Company Act, 1991 where commercial and Islamic banks are run their operation. Islamic banks are interest free which is based on the Sharia Law. Islamic banks are fully depended on the non-interest income from their activity (Karakaya & Er, 2013). Commercial banks are operated by government, foreign company and privately. Commercial banks are borrowing and lending to earn profit from the interest spread. It provides all kind of financial services to its customers. Commercial banks earn fees and commissions as well as the interest income. Banks earn non-interest income by providing the extra services except the borrowing and lending. Bank are generally earn their non-interest income from the fees from collection services, credit fees, deposit account charges, maintenance fees, Cheque book issue fees, ATM service fees, foreign exchange trading gain, stock market trading gain etc. Non-interest income is increasing in Bangladesh after the technological revolution. Third generation and after that all banks are using the technology to provide additional services to retain the customer.

Now-a-days banks are diverting their core lending activities to other service providing activities. They are providing non-core activities such as bill collection, import export standby letter of credit, foreign currency trading, and locker services. Banks collect fees and commission for their customer's services. The advancement of the technology, banks are providing more non-core banking activity such as ATM services, online fund transfer, MICR cheque services etc. Banks are providing these services to sustain in the competitive market in Bangladesh. High non-interest earning source of income is the commission and fees from the off balance sheet activity. The off balance sheet activity helps to earn more which also increases the riskiness of the bank. Regulatory body is concerned about the off balance sheet risk and for that they are formulating the rules and regulation.

Banks are diversifying their activity after the financial liberation where banks are executing all type of banking activity. In the touch of globalization, banks are expanding their non-interest income activities where the rules and regulation is less strict. For expanding the non-interest income activity, banks have not maintained or reserved any capital and it does not increase the CAR ratio. Banks are expanding their non-core activity to reap the growth and capture the market share from the competitors. Risk is managed by diversifying their banking activity and other non-interest income activity. After the liberalization of banking industry, banks are more concentrated in the off balance sheet activities which increases their profitability. Non-interest income increases the bank's profitability and it also manages the risk of the bank loan portfolio. Banks are researching to provide innovative services to customer who helps to retain the market share and profitability of the bank. Technological advancement in banking sector increases the fee based services and

efficiently manages the risk. Non-interest income activity stimulates the bank's profitability and provides the light of hope to sustain in the competitive banking industry. Most of the noninterest income comes from the off-balance sheet activity of the banks. Now, banks are diverting to noninterest income activity for their survival in the competitive market (Bian et.al. 2015). It is also an important source of generating revenue.

1.1 Objective of the study

The study has been conducted to find out the relation of noninterest income activity of financial institutions with performance and risk. The following research objectives are formulated-

- i. To find out the relation and impact of noninterest income on the profitability of the bank.
- ii. To find out the relation of noninterest income with risk.
- iii. To find out the relation between off balance sheet activity and noninterest income.

2.0 Literature Review

Many scholars have shown the relation between noninterest income and performance of the bank. Diamond (1991), Rajan (1992), Saunders and Walter (1994), and Stein (2002) have found that banks are collecting information during lending process. Banks are doing more nontraditional activity which promotes lending of the bank. Non-traditional activity increases the profitability of the bank. Banks are reducing the risk by diversifying the activity and achieving the economics of scope which improves the performance of the bank.

DeYoung et al. (2003) conducted a study on the financial performance and the non-interest income on the selected commercial banks in United States. The researchers have found that banks which are efficient in core banking are expanding the non-interest income activities to tradeoff the risk. They have also concluded that non-interest income activities are not replacing with the core banking activity but these activities help the financial performance of the bank. Non-interest income activities are positively correlated with the firm's earning.

Smith et al. (2003) explained that commission, fees and trading charge are the main component of the noninterest income of the bank. They argued that commission and fees of the services are more consistence in the bank rather interest income. They also concluded that trading income is volatile based on the economy.

Staikouras and Wood (2003) studied on the diversification effects of noninterest income over 15 countries in Europe. They found that noninterest income is more volatile than the traditional interest income of the bank. They found a negative

correlation of interest income and noninterest income of the bank and concluded that noninterest income helps to stabilize the profitability of the bank.

DeYoung and Rice (2004) explained that banks are diverting traditional activity to non-traditional activity over last two decades. The motive for the transformation is the advancement of technology, deregulation of the rules of the bank. Deregulation has increased the competition of bank and non bank financial institutions. Banks are using modern technologies to provide better services in the competitive market. Modern technologies help banks to earn noninterest income. Technology has brought a revolutionary change in banking industry to provide the banking services to the customer (Ankrah, 2012).

Stiroh (2004) studied on the motives of the banking sector in U. S. to divert from traditional activity to noninterest income activity. The researcher found that banks are diverting to nontraditional activity for diversification. The noninterest income is highly related with the net interest income. When the net interest income becomes volatile, noninterest income such as fees, commissions helps to balance the net income of the bank.

Craigwell and Maxwell (2005) investigated the determinants of noninterest income of bank in Barbados. The researcher found that ATM technology and characteristics of bank are the important factor of noninterest income of a bank. They also concluded that banks are motivated to increase the noninterest income activity to increase the profitability.

Baele et al. (2007) have done a research on the diversification of operating income by noninterest income activity of the bank. They found that banks which have high involvement in noninterest income activity increase the expected return of the bank. They also argued that high involvement in noninterest income activity increase the systematic risk of the bank.

Mercieca et al. (2007) have conducted a study on the risk, profitability and noninterest income of the small-sized bank. The researchers have taken 15 countries from European Union for the time period of 1997 to 2003 to find out the relation among risk, profitability and noninterest income. They have found that noninterest income has positive influence on the profitability of the bank but noninterest income has negative relation with risk. They have concluded that noninterest income increases the insolvency risk of the bank.

Chiorrazzo et al. (2008) have done a research on the Italian bank to find out the relation between noninterest revenue and profitability of the firm for the time frame 1993 to 2003. The outcome of the research is that diversification of income helps to earn more risk adjusted return. Only the larger banks get the diversification benefit. The result shows that small banks may be more benefitted from noninterest income activity but large banks get it by its market share.

Lepetit et al. (2008) found that noninterest income activity increases the risk of the financial institutions but it has a positive relation with the profitability. They found a strong correlation among fees, commissions and performance of the bank in the market.

Bailey and Tapper (2010) investigated the relation of the performance of the bank with the noninterest income and macro economy for the time during 1999 to 2010 in Jamaica. The researchers found by analyzing the regression model that ATM technology, foreign exchange rate volatility, loan quality, interest rate and personal lending have positive impact on the noninterest income of the bank.

Mnasri and Abaoub (2010) conducted a study to find out the impact of noninterest income on the profitability of the bank. The result shows that noninterest income activity reduces the performance of the bank. Moreover, banks which are more diversified of their activity face more systematic risk.

Williams and Prather (2010) conducted a study on the impact of noninterest income on the bank's risk and return. The authors collected data from 49 banks in Australia for the time period of 1987-2004. They found that noninterest income is riskier than the margin income of the bank. They concluded that noninterest income activity provides the diversification benefit of the bank.

Hidayat et al. (2012) conducted a study in Indonesia and found that high dependence on the noninterest income activity increases the risk for the small-sized bank because noninterest income activity has high insolvency risk. Large-sized banks are less vulnerable by doing noninterest income activity because they have huge capital to reduce the risk. The researchers added that commissions and fees income activity might increase the risk but the risk of trading income is less visible for the bank. Pennathur et al. (2012) found that noninterest income activity enhances the risk for the private banks but it mitigates the risk of the government owned banks.

Karakaya and Bunyamin, (2012) has investigated to find out the relationship between noninterest income and the performance of the bank. The study has done in Turkey for the time period from 2005 to 2010. Capital adequacy, noninterest income, credit rate, credit provision rate and size of the bank have been selected as the determinants of baker performance. Noninterest income has positive impact on the performance of the bank in Turkey. The author found that capital adequacy, credit rate and size of the bank increase the profitability and general expense reduces the profitability.

Rahman et. al. (2015) conducted a study on the determinants of a firm's profitability by taking a sample of 25 commercial banks. Noninterest income, off-balance sheet activities, bank size, capital adequacy ratio, credit risk, ownership structure, cost efficiency, liquidity and inflation has been chosen as independent variable for the time frame of 2006 to 2013. The outcome of the study is that off balance sheet

activity and cost efficiency has negative impact on the profitability of the bank. They also found that noninterest income is important factor for the profitability of the bank.

Doumpos et al. (2016) conducted a study to find out the relationship between assets diversification and financial stability of the banks in South Asian countries. They have found that assets diversification of banks reduces the risks and increases the financial stability. They have concluded that noninterest sources of income are helpful for financial stability for the bank of developing countries than that of developed countries.

Maudos (2017) found that asset diversification has negative impact on the financial stability of financial institutions. The researcher concluded that increase of noninterest income activity will reduce the profitability of the European banks. The researcher also concluded that noninterest income activity increases the risk and reduces the financial stability of the bank compared to the traditional banks.

Al-Tarawneh et. Al. (2017) have conducted a study on the noninterest income and financial performance of banks in Jordan for the time frame of 2000-2015. They have found that noninterest income increases the non-operating income and helps to increase the retained earnings of the stockholders. Noninterest income has positive relation with profitability and positive impact on the equity capital.

Ahamed (2017) investigated the non-interest income activities of Indian banks. The researcher divide the noninterest income in two groups such as fee based income and commission based income. The conclusion of the study is that noninterest income activity increases the profitability of the banks and reduces the risk which endures the financial stability of the bank.

Ashraf et al. (2017) compare the financial stability of traditional interest generating banks and noninterest generating banks along with the traditional banking activities. They have found that those banks which have highly involved in off-balance sheet activities and noninterest income generating have more financially stable than that of traditional interest generating banks.

Sun et al. (2017) conducted a study on the noninterest income and financial performance of commercial bank in China. They found a nonlinear relationship between noninterest income and financial performance of the bank although noninterest income has negative correlation with the profitability. They concluded that negative impact will reduce on financial performance of the bank if the noninterest income activity increases. They also suggested that noninterest income activity should be controlled to make the bank financially stable in the economy.

Based on the previous study, noninterest income activity increases the profitability of the bank but it also increases the risk. Most of the large sized banks are involving

in the noninterest activity to diversify the portfolio of the bank's income. The related researches have been done in different country but there has been a little work in Bangladesh.

3.0 Methodology of the Study

3.1 Data and Sampling

For the study, the sample size is 10 commercial banks among the 57 banks in Bangladesh. The time frame for the study is started from 2012 and ended to 2016. The data are collected from secondary sources. For the analysis the information of the variables are collected from the published annual report of the bank. The dataset is panel data where the selected banks for five years. The data is collected from the bank website and Dhaka Stock Exchange library. Data collection from the secondary source is taken for the study. The annual report data is used in the study. The quantitative approach is most appropriate method to analyze the data.

3.2 Model of the Study

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_{2i,t} + \beta_3 X_{3i,t} + \beta_4 X_{4i,t} + \beta_5 X_{5i,t} + \beta_6 X_{6i,t} + \beta_7 X_{7t} + \beta_8 X_{8t} + \beta_9 X_{9i} + \varepsilon$$

Where;

Y = Non-interest income (NII) in percentage form for firm i at time t ; the percentage of total non-interest income (fees and commission as well as other income) to total assets (TA).

α = Intercept

$X_{1i,t}$ = Bank size (S) for firm i at time t .

$X_{2i,t}$ = Interest income (INI) for firm i at time t .

$X_{3i,t}$ = Customer deposits (CD) for firms i at time t .

$X_{4i,t}$ = Exposure to risk (ExpR) for firm i at time t .

$X_{5i,t}$ = Liquidity (Liq) for firm i at time t .

$X_{6i,t}$ = Capital adequacy ratio (CapRatio) for firm i at time t .

X_{7t} = Inflation (Inf) at time t .

X_{8t} = Prime rate (PrmR) at time t .

$X_{9i,t}$ = Off Balance sheet amount (Obs) for firm i at time t .

ε = Error variable

3.3 Definition of the variables

3.3.1 Non-interest income (NII)

Noninterest income means the income generated by bank except by lending. Commissions, fees, trading gain and other service fees etc are the sources of noninterest income. Noninterest income is generally comes from the non-core activities of the bank. Noninterest income is used for the study as the ratio of non-interest income to the total asset.

3.3.2 Bank size (S)

Size may be weight or height but size of the firm infers the market capitalization share. Size of the firm has positive influence on the profitability. Large size bank can expand the non-core activity along with the core activity to generate more income and diversify the risk. Large banks have more fund and labor to adapt any technology. Total asset of the bank is used as a proxy of the size of the firm. Natural logarithm of total assets is used as size for the study.

3.3.3 Interest income (INI)

Banks are doing business by lending the fund to the deficit unit and charge a rate for the fund. The interest charge over the borrowers by the bank is the interest income for the bank. The most core activity of the bank is lending and the interest income is the key determinants of bank's profitability. Interest income is negatively related with noninterest income. Interest income is used as the ratio of net interest income to total assets of the bank.

3.3.4 Customer deposits (CD)

Surplus unit deposit their fund to the bank to earn extra and to ensure the safety of the fund. Customer deposit infers to the core activity involvement of the bank. If banks have more deposit, it can lend more and will be busy with the core activity. Customer deposit has negative relationship with the noninterest income of the bank. Customer deposits are used as the total deposit divided by the total asset.

3.3.5 Exposure to Risk (RE)

Risk is the difference between expected and actual income. It is also defined as the uncertainty of income of the bank. Bank has a high risk of default if the lending is not properly analyzed. Both core and noncore activity involves risk. Banks are taking many measurements to reduce the risk. Like that banks are keeping provision for loan loss to minimize the credit risk. Risk exposure is shown as the ratio of provision for loan losses to total asset of the bank.

3.3.6 Bank Liquidity (LIQ)

Liquidity refers to the ability to pay cash without taking much time. Bank's

reputation depends on the liquidity of the bank. Banks can achieve customer's trust by quickly honoring their cheques. High liquidity of a bank reduces risk but it also makes a obstacle for profitability of the bank. Bank should trade off the liquidity and profitability. Liquidity is expressed as the ratio of total current asset divided by the total asset of the bank.

3.3.7 Capital Adequacy (CAR)

Capital adequacy ratio (CAR) refers to the minimum level of capital need by a bank to cope up the risk. It is calculated the tier I and tier II capital divided by the risk weighted asset. Higher CAR refers that the bank can absorb loan losses risk which may arise from noncore activity. But more capital adequacy is harmful to the profitability of the bank. CAR is measured as the ratio of the minimum capital with the risk weighted asset of the bank.

3.3.8 Inflation (INF)

Inflation is the increase of price level of the commodity. It reduces the purchasing power of the buyer. Inflation badly affects the economy. Profitability of the bank is negatively affected by inflation as interest rate increase. In the time of inflation banks are diverting their core activity to the non-core activity to stabilize the income. Yearly inflation rate is used for the study.

3.3.9 Prime Rate (PR)

Prime rate means the base interest rate charged a bank without adding and risk premium. Prime rate has positive influence on the both lending and borrowing rate. Based on this prime rate, many banks are engaging to non-core activities. Prime rate is negatively related with the profitability of the bank. Annual average prime rates of the Bangladesh Bank is used as a proxy of prime rate.

3.3.10 Off-Balance Sheet (OBS)

Off- balance sheet items are not shown in the balance sheet because those items are contingent in nature. Off balance sheet activities are standby letters of credit; interest rate swaps; foreign exchange forward options; repurchase agreements; loan commitments; and recourse associated with sales of assets. Banks are diverting their business to the off balance sheet activity to generate more income. Although off balance sheet activity has high risk, it is being more popular to bank for extra earning. The off balance sheet amount is considered for the study by converting natural log of off balance sheet volume.

4.0 Empirical Analysis

Different attempts have been taken to find out the relationship with the dependent and independent variables with the help of different statistical tools. The analysis of the research has been drawn by using the Stata-12 software.

4.1 Correlation

Correlation refers to the relationships involving dependence; generally it refers to the extent to which two variables have a linear relationship with each other.

Table 1 : Correlation matrix

	NII	S	INI	CD	RE	LIQ	CAR	INF	PR	OBS
NII	1.0000									
S	-0.0760	1.0000								
INI	0.0263	-0.5999	1.0000							
CD	-0.0286	-0.2510	0.1549	1.0000						
RE	0.0499	0.4249	-0.1944	-0.0983	1.0000					
LIQ	0.7068	-0.2435	-0.0825	0.1893	-0.2255	1.0000				
CAR	0.0770	0.1829	-0.3149	-0.3692	0.0762	0.0591	1.0000			
INF	0.4135	-0.4217	0.6701	0.1925	-0.2917	0.2079	-0.2702	1.0000		
PR	0.1726	-0.1942	0.3502	-0.0592	0.1348	-0.0720	-0.1494	0.1762	1.0000	
OBS	-0.1456	0.8059	-0.2646	-0.2999	0.4621	-0.4071	0.1248	-0.2157	0.0362	1.0000

The correlation table infers to the linear relationship between two variables. The relationship can be positive or negative with other variable. Here noninterest income is dependent variable which is correlated with 9 independent variables. Interest income, risk exposure, liquidity, CAR, inflation and prime rate has positive relation with the noninterest income. Size of the bank, customer deposit and off-balance sheet activity has negative relation with noninterest income. When the customer deposit increases in the bank, the trading activity will reduce and the noninterest income will also decrease. Liquidity of the bank has highest positive correlation with noninterest income. When the inflation increases, the lending rates will also increasing that infers lower general banking transaction and higher trading activity.

4.2 Multicollinearity Tests

Table 2 : Variance inflation factor

Variable	VIF	1/VIF
Size	5.56	0.179984
Off-Balance sheet exposure	4.40	0.227174
Interest income	3.37	0.297048
Inflation	2.26	0.443390
Liquidity	1.50	0.668190
Risk exposure	1.41	0.708664
CAR	1.31	0.764198
Customer deposit	1.31	0.766154
Prime rate	1.28	0.779484
Mean VIF	2.49	

Multicollinearity problem occurs when independent variables are highly correlated each other in the research. Variance inflation factor (VIF) is used to measure the multicollinearity problem in the regression model of the study. The standar value of VIF is 10. When the value of VIF is higher than 10 the variable or the model is biased with the multicollinearity problem. By using the Stata command, the table shows that the regression model of the study is free from multicollinearity problem because the value of VIF of all variables is less than 10. Size of the bank has highest VIF among the selected independent variables. As the variables are free from multicollinearity problem, the model is fitted for the study.

4.3 Regression Analysis

Table 3 : OLS regression

Variable	Net interest margin
Size (S)	0. 010203 (0.0074295)
Interest income (INI)	-0.0650385 (0.0010743)
Customer deposit (CD)	-0.0265364** (0.0127307)
Risk exposure (RE)	0.4506434*** (0.1465153)

Variable		Net interest margin
Liquidity (LIQ)		0.0774475*** (0.0099007)
CAR (CAR)		0.0340115 (0.0474825)
Inflation (INF)		0.4850931*** (0.0983181)
Prime rate (PR)		0.192805 (0.0787038)
Off-Balance sheet exposure (OBS)		-0.0041839 (0.003743)
Constant	10	-0.0893984 (0.06399)
N (Observations)		60
F		16.80
R-squared		0.7515
Adjusted R-squared		0.7068
*** Significant at the 1% level, ** significant at the 5% level, * significant at the 10% level. Notes: Robust standard errors are reported in parentheses.		

The research model is statistically valid because the probability of F is less than 5%. The F value of the model is 16.80 where the probability of F value is 0.00. This output table shows that the study on the noninterest income is relevant. The R-square for the ordinary least square regression model is 75.15% which infers that 75.15% of the variation in the profitability on no-interest income is explained by the selected nine independent variables. Adjusted R-square considers all adjustment to the model. Adjusted R-square is more reliable to explain dependent variable of noninterest income with the change of independent variable. The adjusted R-square for the model is 70.68% which indicates that noninterest income is influenced by the change in selected independent variables.

From the analysis, customer deposit, risk exposure, liquidity of the bank, inflation of the economy and prime rate are statistically significant variables for this model. Customer deposits have negative relation with the noninterest income of the bank. When the clients are saving their funds and depositing their fund in the bank, banks are generating income from interest income. If the customers invest their fund in the stock market, customer deposits reduce and increase the noninterest income of the banks. Exposure to risk has positive relation with noninterest income. When the

default risk increases, banks like to increase the provision and try to diversify their risk. For that reason banks are diverting from their traditional activity to the non-traditional activity. Liquidity of the bank has also positive relation with the noninterest income. Banking business operates on the belief of liquidity. Inflation in the economy stimulates the price level of the commodity in the market. Inflation increases the lending rate and motivates banks to earn more from the nontraditional sources. Prime rate of the bank has positive influence on the noninterest income. If the prime rate increases, the lending rate will also increase which stimulate the banks to find out new source of income.

Although size of the bank, capital adequacy ratio and off-balance sheet activities are not statistically significant for this study, those variables has great influence on the profitability of the bank. The relationship of profitability on non-interest income with asset size of the bank is positive. Large banks are likely to engage more nontraditional activity to diversify their risk and generating more income. The most appealing non-interest income source is off balance sheet activity. Fees and other incomes are collected from the non-core banking activity. Off- balance sheet activities are the most lucrative source of noninterest income although these activities involve high risk for the bank. Inflation and risk exposure of the bank have highest influence on the noninterest income.

4.4 Fixed Effect and Random Effect

In fixed effect model, the individual-specific effect is a random variable that is allowed to be correlated with the explanatory variables. Here, the F is less than 5% level of significance which indicates that the model is significant where the independent variables interest income, liquidity, inflation and prime rate are statistically significant independent variable. The R-square value within the variable is 70.60%.

Random Effect is the individual-specific effect is a random variable that is uncorrelated with the explanatory variables. In this model, the chi-square result is significant. Here the five independent variables are statistically significant where risk exposure, liquidity, inflation and prime rate of the bank have positive relationship with the noninterest income and negative relation with customer deposit. The within R square is 56.48% that explains the independent variables.

4.5 Hausman Test

Table 4 : Hausman Test

Coefficients				
	(b) Fixed	(B) Random	(b-B) Difference	sqrt (diag(V_b-V_B)) S.E.
Size	-.0101707	.010203	-.0203736	.0064259
Interest income	-.1867671	-.0650385	-.1217286	.0164915
Customer deposit	-.0187406	-.0265364	.0077958	0
Risk exposure	.2711169	.4506434	-.1795265	0
Liquidity	.0359903	.0774475	-.0414572	.0072643
CAR	.0088258	.0340115	-.0251857	.0075367
Inflation	.4377123	.4850931	-.0473809	0
Prime rate	.1551013	.192805	-.0377037	0
Off-Balance sheet exposure	-.0131908	-.0041839	-.0090069	.0061034
b = consistent under Ho and Ha; obtained from xtreg B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 41.98 Prob>chi2 = 0.0000				

Hauseman Test is a statistical test which is used to identify the best model to fit the study. This test differentiates between random effect model and fixed effect model of the research. The hypothesis for this test is that

Ho: Random Effect is appropriate

H1: Fixed Effect is appropriate

From the hauseman test table, the chi-square is less than 5% which indicates that the alternative hypothesis can't be rejected. So the fixed effect is appropriate for this model where the independent variable's individual-specific effect is correlated with the dependent variables. To view the relationship noninterest income with the independent variables, the single variable can be explained the whole research model.

4.6 Fixed Effect Model

Table 5 : Fixed effect regression model

Variable	Net interest margin
Size (S)	-0.0101707 (0.0098229)
Interest income (INI)	-0.1867671*** (0.0587629)
Customer deposit (CD)	-0.0187406 (0.012136)
Risk exposure (RE)	0.2711169* (0.1465153)
Liquidity (LIQ)	0.0359903*** (0.0122798)
CAR (CAR)	0.0088258 (0.0480769)
Inflation (INF)	0.4377123*** (0.085001)
Prime rate (PR)	0.1551013** (0.0672767)
Off-Balance sheet exposure (OBS)	-0.0131908* (0.0071597)
Constant	0.2615483*** (0.0941037)
N (Observations)	60
Number of groups	10
F	10.94
R-squared	within = 0.7060 between = 0.1846 overall = 0.3613
*** Significant at the 1% level, ** significant at the 5% level, * significant at the 10% level. Notes: Robust standard errors are reported in parentheses.	

When the individual-specific effect of a random variable is allowed to be correlated with the explanatory variables, it is called fixed effect of the regression. After Hausman test, the fixed effect model is appropriate for this study. The model is statistically significant where the probability of F is less than 5% level of significance. For this study different banks are referred as code. The R-square within the code is 0.7060 which refers that 70.60% of noninterest income is explained by the selected variables within bank. R-square between banks is 0.1846 for the study. The overall R-square is 0.3613. Alpha of the study is statistically significant and explains that 26.15% of the noninterest income of the bank will be constant. Interest income, liquidity, inflation and prime rate are statistically significant at 5% level of significance. Risk exposure and off-balance sheet activity are also significant at 10% level of significance. Noninterest income is negatively influenced by interest income of the bank. When interest income increases, banks are not willing to divert their activities. Liquidity, inflation rate and prime rate have positive impact on the noninterest income of the bank.

5.0 Findings of the study

Non-interest income activity has positive relation with profitability and risk of the banks. Off balance sheet activity has negative impact on the profitability and positive influence on risk of the bank in the economy. Non-interest income increases the liquidity of the bank. From the observation of the study, noninterest income model is statistically significant. That means the models we used in this analysis succeed to fulfill the research objective. It has found from the analysis that non-interest income increases the profitability as well as the risk of the firm. The non-interest income accelerates the economic growth of the country and makes easy of financial activity to the customers. Banks are encouraged to doing the non-interest income bearing activity such as ATM services, online shopping, bill payment services, off balance sheet activity etc. OLS regression finds that customer deposit, risk exposure, liquidity of the bank, inflation of the economy and prime rate are the significant variables to explain noninterest income of the bank in Bangladesh. Size of the firm has positive influence on the noninterest income. Large banks are likely to engage more nontraditional activity to diversify their risk and generating more income. Interest income is negatively related with noninterest income and infers that more traditional activity is less stimulating to divert to the nontraditional risky activity. When the customer deposits increase, banks are less motivated to do noninterest income bearing activity in the market. Banks are doing noninterest income activity to diversify the risk of the business. It reduces the income risk. Economic factors such as inflation rate and prime rate are positively related with the noninterest income activity. Off balance sheet activity helps to generate earning but in this study shows it has negative relation with the noninterest income. Off-balance sheet activities increase the default risk of the bank. Liquidity of the bank helps to maintain goodwill of the bank which positively helps to earn more for the bank.

6.0 Conclusion

Commercial banks are using the blessings of technological. Due to more competitiveness in capturing market share, banks are diversifying their banking activity to increasing revenue and reduce the risk. Some banks are doing more non core banking activity such as off balance sheet activity and other fees generating activities. The growing of non-interest income generating activity is less regulation and no need to put additional capital for these activities. Noninterest income activity adds more profit for the bank. Along with profit, off-balance sheet activity increases the risk exposure of the banking sector. Banking industry is highly vulnerable in Bangladesh where loan default rate is high. Bank has limited access to invest in the stock market. Banks can earn extra income from non-core activity over the core banking activity of deposit collection and loan disbursement. Interest income is negatively related with noninterest income. Banks are trying to introduce new product or services to compete in the competitive market. Noninterest income activity provides more liquidity for the banks. Large banks are more concentrated in nontraditional activity where they can generate more income over small size banks which are doing the traditional activity to secure the income level. Due to the off balance sheet activity, banks are facing more risk and they put more provisions for this activity. Provision for loan losses and other provisions decrease the firm's profitability. Inflation of a country is a macro variable which has negative relation with the profitability of the bank but has a positive relation with the noninterest income. Because of long term loan rate is fixed but it can't adjust due to high inflation and reduces the income. Inflation increases the lending rate and motivates banks to earn more from the nontraditional sources. The non-interest income accelerates the economic growth of the country and makes easy of financial activity to the customers. Banks are encouraged to doing the non-interest income bearing activity such as ATM services, online shopping, bill payment services, off balance sheet activity etc. Noninterest income activity creates new risk for the banking industry. Central bank and policymakers should facilitate these activities but the risk level should be considered and formulated rules and regulation for the non-interest income bearing activity. Further research may be conducted on the off-balance sheet activity's risk and return of the bank.

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