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Effect of Income Diversification on Risk-Adjusted Profitability of Commercial and Development Banks in Nepal

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Abstract

This study analyses the impact of income diversification on risk adjusted profitability of commercial and development banks in Nepal. Risk adjusted profitability is measured in terms of risk adjusted return on assets (RAROA) and risk adjusted return on equity (RAROE). The regression analysis shows Herfindahl Hirschman Index (HHI), equity multiplier, non-interest income and foreign holding have significant positive impact on RAROE of commercial banks. Whereas the size of commercial banks has a significant negative impact on RAROE. There is a significant positive impact of HHI, non-interest income on RAROA in case of commercial banks. Size of commercial banks also has a significant negative impact on RAROA. Debt ratio does not have significant impact in case of RAROE of commercial banks and equity multiplier, debt ratio and foreign holding do not have significant impact on RAROA of commercial banks. The regression analysis of development banks showed there is significant positive impact of HHI and equity multiplier on RAROE of development banks. The study concludes that income diversification, non-interest income and size of the commercial banks are the major determinants of risk adjusted profitability of commercial banks.

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1. Introduction and Study Objectives

Business of financial intermediation is hugely impacted by the banking business around the world. Banks are transcending their normal business operations and diversifying their activities in response to economic and financial sector reforms. The banking business has grown over a period of time resulting in diversity and complex operations. Mixing a wide variety of investment within a portfolio is a great way to reduce risk which is also known as Diversification. Its main motive is to maximise returns.

Banks have progressed from normal line of business to intermediate services which are non-interest earning in nature. The normal line of business included mobilising deposits and whereas intimidation services include provision of financial guarantees, insurance and other financial services (Damankah, Olivia, Musah, & Nuhu, 2015). Banks can diversify their income by offering more products and services.

The financial crisis of 2008 has planted many lessons in the banking industry. One of the lessons is the diversification of income sources and reducing the reliance on traditional lending activities. This along with risk exposure has been addressed by researchers, largely in developed countries (Lepetit et al., 2008; Meslier et al., 2014). Diversified banks can attain the economies of scope by spreading fixed cost over multiple products. Diversification of non-interest income such as fees, commission and discount income will increase total operating income of the banks since they are not correlated with the net interest income of the banks. (Gurbuz, Yanik, & Ayturk, 2013). DeYoung and Rice (2004) found that risk-adjusted performance is negatively affected by increasing focus on non-interest income. They can increase levels of earnings, however increased volatility results in reduced risk-adjusted performance measures.

2. Literature Review

Lozano-Vivas and Pasiouras (2010) showed fee income has become an increasingly relevant aspect of bank's income composition as the non-traditional banking components of a bank's financial statements in estimating their performances. Additionally, DeYoung and Rice (2004) found that non-interest income is believed to increase banks profitability. However, it also found that the risk is higher as it is associated with the increase in earnings volatility

Nepali (2017) revealed that both equity to total assets ratio as well as loan to total assets have inverse relationship with both risks adjusted return on assets and risk adjusted return on equity. In addition to this, equity to total assets ratio and loan to total assets ratio also have an inverse effect on the risk adjusted performance of Nepalese commercial banks.

Gajurel and Pradhan (2012) showed more competitiveness in the market of interest-based income when compared with the market of fee-based income.

In addition, it also shows a negative effect on revenue generation in Nepalese banking industry caused by equity capital. The Nepalese banking industry has been seen steadily shifting away from traditional sources of revenue like loan-making etc., towards non-traditional activities that generate fee income, service charges, trading revenue and other types of non-interest income. The above discussion shows that the studies dealing with income diversification and risk adjusted financial performance of greater significance. Though there are various findings as discussed above in the context of different countries, not many findings exist in terms of development and commercial banks in the context of Nepal.

Thus, this study attempts to analyse the relationship between income diversification and risk adjusted financial performance of Nepalese commercial and development banks. Specifically, it examines the effect of noninterest income, income diversification, equity ratio, debt ratio, foreign ownership/level and bank size on risk adjusted performance of commercial and development banks in Nepal. However, this kind of study for both commercial and development banks have not been initiated in the context of Nepalese banks.

Ismail et al. (2014) used the pooled ordinary least square regression analysis, the study has tried to investigate the relationship between performance of 14 banks operating in Pakistan within 2006-1013 and income diversification. The study claims that by using interest and non-interest income as their income generating sources, the banks can increase their performance with more diversification. Moreover, the study's results also showed that the bank size, loan size, loan ratio and equity ratio have a positive impact on the performance of the bank.

The relationship between non-interest income and financial performance in the United States banking sector for the period of 1989-2001 was examined by DeYoung and Rice (2004). They found a negative relationship between non-interest income and risk-adjusted financial performance of the U.S. banks. The study showed that marginal increase in the non-interest income has been linked with higher profits, more variable profits and on net which is the deterioration of risk-return trade-off for the average commercial banks.

Smith et al. (2003) carried out a research to examine the variability of interest and non-interest income and also their correlation. It analysed the banking system of the 15 EU countries during the period of 1994-1998 for the research. For each country, it considered commercial, saving, cooperatives, and mortgage banks as well as large and small banks. It also studied the correlation of income sources. Results show that majority cases of stabilized profits are caused by the increased reliance on activities that generate non-interest.

A broad diversification of income sources can reduce the financial performance of banks. Non-interest based indulged income diversification can bring new risks which requires specialized managerial expertise. In case of negligence of management of these risks, the performance can be adversely affected (Sahoo & Mishra, 2012).

Pennathur et al. (2012) analysed Indian banks over the period of 2001-2009 for the impact of ownership on income diversification. Both non-interest income and impact of diversification on various profitability and insolvency risk measures for public sector, private domestic and foreign banks are examined by the study. It showed that fee-based income significantly reduces risk, measured by profitability variables for the public sector banks. In addition, it also showed that the default risk is lower for these banks and diversification benefits India's public sector banks.

Meslier et al. (2014) analysed about the presence of advantages from diversification of bank incomes in developing market economies. The study used comprehensive information on non-interest income including data on 39 banks of the Philippines for the period of 1995-2005. The study found that there is extended dependence on non-interest sources of income. Doing so expands the benefit of banks as well as improves risk adjusted returns.

Zhou (2014) examined the impact of income diversification on bank risk using panel data for 62 Chinese commercial banks during 1997-2012. The study found that deposit to total assets ratio and equity to total assets ratio has a positive impact on the bank risk. This shows increment in above factors increase in risk. Be that as it may, loan to assets ratio has a negative effect on the bank's risk showing the expansion in loan to assets ratio diminishes the bank's risk.

Foreign banks are less cost productive moderately than medium and small banks. The entry of foreign bank enhanced rivalry which powers banks to lessen cost, diversify products through advancement offer better types of assistance to customer base to minimise risk and to hold customers (Panta & Bedari, 2015).

Hang et al. (2017) analysed the impact of income diversification on profitability and risk of commercial banks of Vietnam. The study found that deposit ratio, loan ratio and size have a negative impact on risk adjusted performance. Equity ratio has a positive relationship with the SDROA whereas it has negative relationship with the SDROE. The study further concludes that the diversification of income is not beneficial for commercial banks in Vietnam.

Nepali (2017) examined an impact of income diversification on the risk return trade off of 20 Nepalese commercial banks. The study used the secondary data assembled from 2009 to 2015. The regression models were estimated to test the significance of income diversification. The result showed non-interest income and bank size are positively correlated to risk adjusted return on equity. Further, Herfindahl- Hirschman Index- HHI has a positive impact on risk adjusted performance. The equity to total assets ratio and loan to total assets ratio have a negative effect on the risk adjusted performance of Nepalese commercial banks. The study concludes that income diversification-HHI followed non-interest income, equity to total assets ratio are the most dominant factors that affect the risk return trade off in the context of Nepalese commercial banks.

This study follows an approach adopted by Nepali (2017) which considered certain factors important to see the effect of income diversification on risk adjusted profitability. So, the following conceptual framework is drafted to conduct the study.

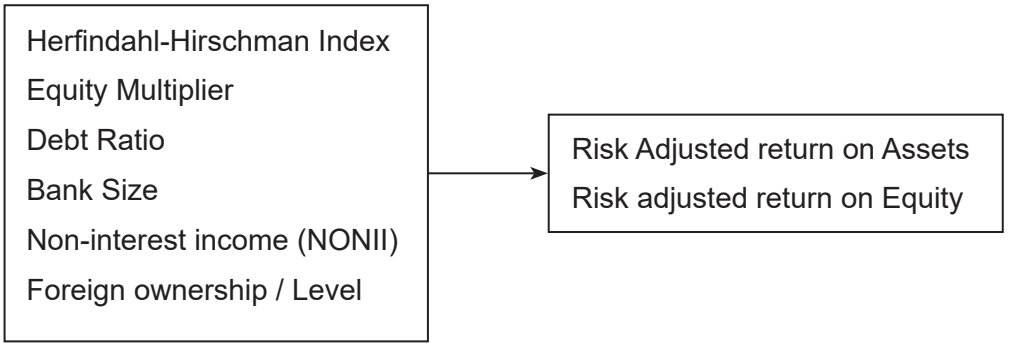

Figure 1. *Conceptual Framework*

Risk Adjusted Return on Assets (RAROA) defines an investment's return by measuring how much risk is involved in producing that return. It is the ratio of ROA to standard deviation of ROA over the sample period (Milani et al., 2008; Goddard et al., 2008). **Risk Adjusted Return on Equity (RAROE)** is the ratio of ROE to standard deviation of ROE over the sample period (Hang et al., 2017; Gurbuz et al., 2013). **Non-interest Income (NONII)** is the income generated by banks other than loan generation. It is derived primarily from fees including deposit and transaction fees, ATM charges, monthly account service charges, inactivity fees, and so on. **Herfindahl- Hirschman Index (HHI)** is a measuring tool of income diversification which measures the level of revenue diversification in the composition of net operating income (Gurbuz et al., 2013). Net operating income (NOI) captures the total value of NETII and NONII. HHI varies between 0.5 and 1.00. HHI value of 0.50 indicates complete income diversification in a bank, while HHI value of 1.00 represents the lowest level of income diversification.

Equity Multiplier measures a company's financial leverage by using a ratio of the company's total assets to its stockholders' equity. **Debt Ratio** determines the total amount of loan relative to assets. The higher the ratio, the higher the degree of leverage (DOL) and, consequently, financial risk. **Total Assets** is used as a proxy of bank size. **Foreign Ownership** refers to the significant stake of foreign banks or companies in the capital structure of the bank. In this study, it is used as a dummy variable where dummy variable 1 is for foreign banks, 0 otherwise. **Level** is used for different levels of Development banks categorised by Nepal Rastra Bank**.** Development banks in Nepal are classified as national level development banks and district level development banks. If the bank has its branches in more than 10 districts, then it is termed as national level banks whereas there are ten districts development banks, three district development banks and one district development banks. But, in this

study development banks are classified as national development banks and rest other as district level development banks. Further, it is used as a dummy variable; 1 is for national level development banks and 0 otherwise.

3. Study Methods

This study was based on the quantitative method. Financial information of commercial and development banks is collected from publication of NRB, annual report, and websites of respective banks. An effort is made to describe the nature of 10 commercial banks and 11 development banks during the fiscal year 2010/11 A.D. through 2016/17 A.D. with respect to income diversification variables and risk adjusted performance of commercial and development banks. There are 28 commercial banks out of which 8 foreign banks and 20 non-foreign banks. Similarly, out of 33 development banks, 11 are national development banks and 22 are regional development banks (Nepal Rastra Bank, 2017).

The study considered the sample banks which are still in operation. In case of commercial banks, two public commercial banks are not considered for the study as these banks presented outliers in the data structure.

For validity of data, autocorrelation test is carried out which showed that the model is statistically fit. Similarly, Variance Inflation Factor (VIF) test is also performed on the explanatory variables to test whether the data can be used in regression model. If the VIF value is less than 10, it is acceptable for multivariate regression model. Als,o Durbin Watson (DW) test was conducted.

As a sample, 10 commercial banks are selected for the study with the study period of 2010/11 to 2016/17. So, there are 70 observations in total. The commercial banks considered for this study are Nepal Bank Limited, Nepal Investment Bank Limited, Standard Chartered Bank Nepal Limited, Nepal SBI Bank Limited, Nepal Bangladesh Bank Limited, Everest Bank Limited, Bank of Kathmandu Limited, NIC Asia Bank Limited, Machapuchhre Bank Limited, and Kumari Bank Limited.

Similarly, 11 sample development banks are selected for the study with the same study period of 2010/2011 to 2016/17. But the study period of Kailash Bikash bank is 2012/13 to 2016/17 because it was established in that year only. The sample development banks are Gandaki Development Bank, Excel Development Bank, Miteri Development Bank, Tinau Bikas Bank, Muktinath Bikas Bank, Kankai Bikas Bank, Shangrilla Bikash Bank, Shine Resunga Bikas Bank, Garima Bikash Bank, Jyoti Bikash Bank, and Kailash Bikash Bank.

Data Analysis Methods

At first descriptive statistics of sample observations including mean, standard deviation, minimum, maximum values of the observations are dealt. Test of significance, standard error of estimate and multicollinearity is tested to make

results more valid. All observed relationships and findings are interpreted to derive the meaningful conclusions regarding the relationship between income diversification and risk adjusted performance of banks.

The following regression model is used in this study to examine the empirical impact of income diversification on risk adjusted profitability of selected banks. Thus, the following model equation is designed to test the hypothesis. From the conceptual framework the function of dependent variables (i.e. risk adjusted performance) takes the following form:

Risk adjusted performance= f (NONII, HHI, Equity Multiplier, Debt Ratio, Size, Foreign ownership/ Level)

The underlying models for commercial banks are:

$$\text{RAROA} = \beta 0+\beta 1\text{HHI}+\beta 2\text{EquityMultiplier}+\beta 3\text{Debt Ratio}+\beta 4\text{size}+\beta 5\text{NONII}+\beta 5\text{Foreign holding}+e$$

$$\text{RAROE} = \beta 0+\beta 1\text{HHI}+\beta 2\text{EquityMultiplier}+\beta 3\text{Debt Ratio}+\beta 4\text{size}+\beta 5\text{NONII}+\beta 5\text{Foreign holding}+e$$

The underlying models for development banks are:

$$\text{RAROA} = \beta 0+\beta 1\text{HHI}+\beta 2\text{EquityMultiplier}+\beta 3\text{Debt Ratio}+\beta 4\text{size}+\beta 5\text{NONII}+\beta 5\text{Level}+e$$

$$\text{RAROE} = \beta 0+\beta 1\text{HHI}+\beta 2\text{EquityMultiplier}+\beta 3\text{Debt Ratio}+\beta 4\text{size}+\beta 5\text{NONII}+\beta 5\text{Level}+e$$

4. Data Analysis and Results

The study used secondary data especially from that of Nepal Rastra Bank, the central bank of Nepal. This section presents the data analysis and the results.

Table 1.

Descriptive Statistics for Selected Commercial Banks

	Unit	Minimum	Maximum	Mean	Std. Deviation
RAROE	%	0.42	7.21	3.93	1.85
RAROA	%	0.47	9.87	4.83	2.15
HHI	%	0.50	0.71	0.61	0.05
Equity Multiplier	%	6.70	23.63	13.17	3.13
Debt Ratio	%	0.67	0.94	0.90	0.04
Size	Amt (Rs.)	18,322.08	162,896.60	64,164.70	33,725.54
NONII	Amt (Rs.)	191.42	2,181.47	742.46	438.79
Foreign holding	%	0.00	1.00	0.50	0.50

Note. Nepal Rastra Bank, 2017

The result shows the descriptive statistics of dependent and independent variables for the selected commercial banks. Clearly, risk adjusted return on equity ranges from minimum 0.42 to maximum of 7.21 leading to an average of 3.93.HHI ranges from a minimum of 0.50 to a maximum of 0.71 leading to an average of 0.61. It indicates that, on an average, the majority of the banks are approaching 0.50 which is an indicator of the income diversification. Similarly, the risk adjusted return of assets ranges from a minimum of 0.47 to a maximum of 9.87 leading to an average of 4.83. The deviation on RAROA (2.15) is more than RAROE (1.85).

Table 2

Descriptive Statistics for Selected Development Banks

	Unit	Minimum	Maximum	Mean	Std. Deviation
RAROE	%	0.31	6.87	3.40	1.36
RAROA	%	1.25	10.01	4.25	1.87
HHI	%	0.51	0.82	0.71	0.07
Equity Multiplier	%	0.92	24.35	10.86	3.37
Debt Ratio	%	0.15	1.51	0.85	0.13
Size	Amt (Rs.)	455.89	22037.72	5808.95	5343.96
NONII	Amt (Rs.)	5.00	255.00	55.44	58.95
Level	%	0.00	1.00	0.54	0.50

Note. Monthly statistics published by Nepal Rastra Bank

The result shows the descriptive statistics of dependent and independent variables for the selected development banks. Clearly, RAROE ranges from minimum 0.31 to maximum of 6.87 leading to an average of 3.40 with the standard deviation of 1.36. Similarly, the RAROA ranges from a minimum of 1.25 to a maximum of 10.01 leading to an average of 4.25 with a standard deviation of 1.87. HHI ranges from a minimum of 0.51 to a maximum of 0.82 leading to an average of 0.71. It indicates that, in comparison to commercial banks, development banks are relatively backward approaching to an indicator of the income diversification.

4.1 Correlation Analysis of Commercial Banks

Pearson correlation coefficients are computed and the results of commercial banks are presented in Table 3 whereas the results of development banks are presented in Table 4. More specifically, it shows the correlation coefficients of dependent and independent variables for selected commercial and development banks.

Table 3
Pearson Correlation Matrix for Commercial Banks

	X1	X2	X3	X4	X5	X6	X7
X1	1	.680**	0.133	.539**	.279*	.310**	.386**
		0.000	0.274	0.000	0.020	0.009	0.001
X2		1	-0.036	-0.007	-0.001	.335**	.526**
			0.77	0.955	0.997	0.005	0.000
X3			1	.419**	0.202	0.077	-.294*
				0.000	0.094	0.528	0.013
X4				1	.453**	0.167	-0.042
					0.000	0.168	0.728
X5					1	-0.08	-0.136
						0.512	0.261
X6						1	.856**
							0.000
X7							1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
Source. Nepal Rastra Bank
Note. Monthly statistics published by Nepal Rastra Bank

The above table shows the correlation matrix between dependent variable and independent variables, where, X1 = RAROE, X2= RAROA, X3= HHI, X4= Equity Multiplier, X5= Debt Ratio, X6=Size of commercial banks, and X7= NONII.

The result reveals there is significant positive correlation between equity multiplier, size, NONII and RAROE. It indicates that increase in equity multiplier, size, NONII leads to increase in RAROE. The result is significant at the 1 per cent level of significance. Higher the debt ratio, higher will be RAROE significant at 5 per cent level of significance. Also, there is significant positive correlation between size of commercial bank, NONII, and RAROA. It indicates that increase in size and NONII leads to increase in RAROA.

4.2 Correlation Analysis of Development Banks

The above table shows the correlation matrix between dependent variable and independent variables, where, X1 = RAROE, X2= RAROA, X3= HHI, X4= Equity Multiplier, X5= Debt Ratio, X6=Size of development banks and X7= NONII.

Equity multiplier is positively correlated to RAROE. It indicates that increase in noninterest income leads to increase in RAROE. Similarly, NONII is positively correlated to RAROA which indicates increase in NONII will increase RAROA of development banks.

Table 4

Pearson Correlation Matrix for Selected Development Banks

	X1	X2	X3	X4	X5	X6	X7
X1	1	.688**	0.099	.456**	0.076	0.216	0.154
		0.000	0.397	0.000	0.512	0.062	0.183
X2		1	-0.068	-0.141	-0.195	0.189	.300**
			0.558	0.225	0.092	0.101	0.009
X3			1	-0.077	.356**	0.146	-0.155
				0.507	0.002	0.209	0.183
X4				1	0.216	-0.025	-0.14
					0.061	0.832	0.226
X5					1	0.186	-0.002
						0.108	0.985
X6						1	.896**
							0.000
X7							1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Note. Data from the monthly statistics published by Nepal Rastra Bank

4.3 Regression Analysis of Independent Variables on RAROE of Commercial Banks

Table 5

Estimated Regression of Independent Variables on RAROE of Commercial Banks

Model	Beta	t-value	Sig.	VIF
(Constant)	-5.561	-1.103	0.274	
HHI	13.494	3.823	0.000	2.106
Equity Multiplier	0.25	4.623	0.000	1.802
Debt Ratio	3.074	0.755	0.453	1.308
LnSize	-2.099	-3.131	0.003	8.075
LnNONII	2.696	4.075	0.000	9.457
Foreign holding	1.583	4.908	0.000	1.664
R-square	0.707			
F	25.305			
Sig	0.000			

Note. Monthly statistics published by Nepal Rastra Bank

On the basis of above findings following regression have been developed:

RAROE = -5.561+ 13.494 HHI + 0.25 Equity Multiplier + 3.074 Debt ratio - 2.099 LnSize + 2.696 LnNONII + 1.583 Foreign holding

Coefficient regression in Table 5 shows HHI, equity multiplier, NONII and foreign holding has significant positive impact on RAROE whereas size of commercial banks has negative significant impact on RAROE. Regression coefficient of HHI in the regression coefficient analysis is 13.494 which indicates that if we increase HHI by 1 per cent, RAROE will increase by 13.494 per cent. Similarly, if we increase equity multiplier level by 1 per cent, the average influence on RAROE will increase by 0.25 per cent. Further, if we increase in total assets of commercial banks by 1 per cent, the average influence on RAROE will decrease by 2.099 per cent. Likewise, if we increase in NONII by 1 per cent, the average influence on RAROE will decrease by 2.696 per cent. And, if the bank has foreign holding RAROE will increase by 1.583 per cent.

But there is no any significant impact of debt ratio on RAROE in contradiction to correlation analysis. It is because correlation analysis shows association or the absence of relationship between variables but regression analysis assumes that there is mathematical relationship between the dependent and independent variables.

Moreover, R-square is 70.7 per cent which states that the independent variables explain dependent variable by only 70.7 per cent. It consists many other factors as well that influence the dependent variable. This regression coefficient explains 70.7 per cent of the dependent variable. Also, F value and significance level are 25.305 and 0.000 which states that this regression equation is acceptable.

HHI has significant positive impact on RAROE. This finding is consistent with the findings of Gurbuz et al. (2013) as it showed the income diversification, measured through HHI improves risk adjusted profitability. Above finding is similar to the findings of Meslier et al. (2014) too. Foreign ownership has significant positive impact on RAROE. This finding is not consistent with the findings of Hafidiyah and Trinugroho (2016), and Vinh. The equity multiplier has positive significant impact on RAROE. The finding is consistent with Hafindiyah and Trinugroho (2016); found equity multiplier is positively associated with the proxy for risk adjusted return. But this finding is in contrary to the findings of Ismail et al. (2014). Similarly, the negative regression coefficient for bank size shows that bigger the bank's size, lower would be RAROE. This finding is consistent with the findings of Stiroh (2004). But, Vinh et al. (2016) found that the bank size has positive relationship with risk adjusted return. The result further shows that NONII has significant positive impact on RAROE. This finding is consistent with Nepali (2017) but inconsistent with DeYoung and Rice (2004); found that an increased focus on non-interest income is associated with a decline in risk-adjusted performance.

Regression Analysis of Independent Variables on RAROA of Commercial Banks

Table 6

Estimated Regression of Independent Variables on RAROA of Commercial Banks

Model	*Beta*	*t- value*	*Sig.*	*VIF*
(Constant)	-1.223	-0.155	0.878	
HHI	21.366	3.86	0.000	2.106
Equity Multiplier	-0.019	-0.222	0.825	1.802
Debt Ratio	1.475	0.231	0.818	1.308
LnSize	-3.928	-3.737	0.000	8.075
LnNONII	5.379	5.184	0.000	9.457
Foreign holding	0.507	1.003	0.320	1.664
R-square	0.47			
F	9.324			
Sig	0.000			

Note. Monthly statistics published by Nepal Rastra Bank

On the basis of above findings following regression have been developed:

RAROA= -1.223 + 21.366 HHI – 0.019 Equity Multiplier + 1.475 Debt Ratio – 3.928 size + 5.379 NONII + 0.507 Foreign holding

Coefficient analysis Table 6 shows HHI, and NONII have positive significant impact on RAROA whereas size of commercial bank has negative significant impact on RAROA. But equity multiplier, debt ratio and foreign holding does not have any significant impact on RAROA.

If there is increase in HHI by 1 per cent, the average influence on RAROA will increase by 21.366 per cent. Similarly, if there is increase in total assets of commercial banks by 1per cent, the average influence on RAROA will decrease by 3.928 per cent. And, if there is increase in NONII by 1 per cent, the average influence on RAROA will increase by 5.379 per cent.

Moreover, the independent variables explain dependent variable by only 47 per cent. It consists many other factors as well that influence the dependent variable.

It showed the regression coefficients are positive for NONII and HHI. This finding is consistent with the findings of Nepali (2017). But the regression coefficient is negative for debt ratio. These findings contradict the findings of Goddard et al. (2008) but it is consistent with the findings of Nepali (2017). Likewise, the regression coefficient is negative for bank size which shows that bigger the bank's size, lower would be RAROA. This finding is consistent with the findings of Goddard et al. (2008), Nepali (2017). The equity multiplier does not have significant impact on RAROA of commercial banks. This finding is not consistent

with the findings of Acharya et al. (2006).

Regression Analysis of Independent Variables on RAROE of Development Banks

When regression analysis of Independent Variables on RAROE of Development Banks was calculated, size of development banks and NONII have VIF more than 10 which means independent variables show multi-collinearity. So variable size has been dropped as it has highest VIF, i.e., 11.076. Hence, below regression analysis is derived.

Table 7

Estimated Regression of Independent Variables on RAROE of Development Banks After Dropping Independent Variable-Size.

Model	*Beta*	*t-value*	*Sig.*	*VIF*
(Constant)	-2.359	-1.349	0.182	
HHI	4.487	2.028	0.046	1.226
Equity multiplier	0.224	5.043	0.000	1.213
Debt Ratio	-1.281	-1.078	0.285	1.244
LnNONII	0.314	1.747	0.085	1.571
Level	0.220	0.629	0.532	1.674
R-square	0.301			
F value	6.039			
Sig	0.000			

Note. Monthly statistics published by Nepal Rastra Bank

RAROE = -2.359+ 4.487 HHI + 0.224 Equity Multiplier – 1.281 Debt ratio + 0.314 NONII + 0.22 Level

Coefficient analysis in Table 7 shows HHI, equity multiplier has significant positive impact on RAROE whereas debt ratio, NONII and level do not have significant impact on RAROE.

If there is increase in HHI by 1 per cent, RAROE will increase by 4.487 per cent. Similarly, if there is increase in equity multiplier level by 1 per cent, the average influence on RAROE will increase by 0.237 per cent. This regression coefficient explains 30.7 per cent of the dependent variable.

Comparing with the commercial banks, the result of RAROE of commercial banks and development banks is consistent in case of HHI, equity multiplier. There is positive significant relationship of HHI, equity multiplier. But there is significant positive relationship of NONII of commercial banks on RAROE but there is no any significant relationship of NONII of development banks on RAROE.

As the HHI of both commercial banks and development banks have significant positive impact on RAROE banks should diversify their income rather than interest

income only. Higher the income from non-interest sources higher will be the risk adjusted return on equity. Equity multiplier too has significant positive impact on RAROE in both classes of banks. Debt ratio does not have any significant impact on RAROE.

But in case of commercial bank total size of the banks matters as it has significant positive impact but in case of development banks this variable is removed due to multi-collinearity. Similarly, foreign holding commercial banks have significant positive impact on RAROE but in case of development banks whether the banks are national level or district level it does not have impact on its RAROE.

Regression Analysis of Independent Variables on RAROA of Development Banks

When regression analysis of Independent Variables on RAROA of Development Banks was calculated, size of development banks and NONII have VIF more than 10. So, independent variables show multi-collinearity. Hence variables, NONII and size has been dropped as their VIF is greater than 10. Hence, below regression analysis is derived.

Table 8

Estimated Regression of Independent Variables on RAROA of Development Banks

Model	*Beta*	*t-value*	*Sig.*	*VIF*
(Constant)	5.351	2.219	0.030	
HHI	0.800	0.244	0.808	1.20
Equity multiplier	0.007	0.102	0.919	1.21
Debt Ratio	-2.869	-1.616	0.110	1.23
Level	1.286	2.979	0.004	1.13
R-square	0.154			
F value	3.236			
Sig	0.017			

Note. Monthly statistics published by Nepal Rastra Bank

On the basis of above findings following regression have been developed:

RAROE = 5.351+ 0.8 HHI + 0.007 Equity Multiplier – 2.869 Debt ratio + 1.286 Level

Coefficient analysis in Table 10 shows only the level of development bank has significant positive impact on RAROA. Remaining variables like HHI, equity multiplier, and debt ratio does not have significant impact on RAROA. This regression coefficient explains 15.4per cent of the dependent variable. Comparing the result with commercial banks, only the foreign holding has positive impact on RAROA of development banks. But in case of commercial bank HHI and NONII

has significant positive impact and size of the commercial bank has significant negative impact on RAROA.

As the HHI of commercial banks have significant positive impact on RAROA but there is no impact in case of development banks. As it is proxy for the measurement of income diversification, there is no impact of income diversification on RAROA of development banks.

Similarly, in case of commercial bank total size of the banks matter as it has significant negative impact on RAROA but in case of development banks this variable is removed due to multi-collinearity.

The only independent variable which has significant impact on RAROA is level of development banks. If the bank is national level development bank, then RAROA increases and vice versa.

5. Conclusion and Implications

The major conclusion of the study is income diversification, non-interest income and size of the commercial banks are the major determinants of risk adjusted profitability of commercial banks. There is positive impact of diversification on the risk adjusted performances of the commercial banks. It shows Nepalese commercial banks are in process of diversifying their income. Non-interest income has positive and significant impact on risk adjusted performance of commercial banks. It indicates commercial banks should focus on generating non-interest income through modern banking activities to generate higher risk adjusted return. But there is negative impact of size of commercial banks on risk adjusted performance of commercial banks. It means larger the size of the banks smaller will be the risk adjusted profitability. Foreign holding banks seem to have higher Risk adjusted return on equity as its beta is significant whereas there is no significant difference in foreign holding bank and domestic bank for risk adjusted return on assets.

The result of RAROE of commercial banks and development banks is consistent in case of HHI, equity multiplier. Equity multiplier too has significant positive impact on RAROE in development banks. Generally, a lower equity multiplier indicates a company has lower financial leverage. Hence, higher the equity multiplier or lower shareholders' equity than its assets, higher will be the RAROE. The HHI of commercial banks have significant positive impact on RAROA but there is no impact in case of development banks. As it is proxy for the measurement of income diversification, there is no impact of income diversification on RAROA of development banks. The only independent variable which has significant impact on RAROA is level of development banks. If the bank is national level development bank, then RAROA increases and vice versa.

This study provides additional evidence regarding the search of performance drivers of financial institutions from an academic point of view. Similarly, the study

has policy implications for commercial and development banks in that they should not only focus on interest as a source of income and diversify their income source from non-interest income as well as it helps to improve risk adjusted profitability for them. The regulator should not restrict financial institution from charging for other important facility that they provide to their customer like mobile banking, debit and credit card facility; fees and commission from letter of credit, bank guarantee, life and non-life insurances, bank assurance, etc., as it increases return of banks with less volatility. Besides this, regulators should encourage modern banking practices, which increase non-interest income leading to increase profitability of banks

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