Effect of firm specific factors and reinsurance on performance of Nepalese Insurance Companies

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Abstract

This study examines the effect of firm specific factors and reinsurance on performance of Nepalese insurance companies. Return on assets (ROA) and return on equity (ROE) are the dependent variables. The selected independent variables are firm size, liquidity, assets tangibility, net claim ratio, net commission ratio and ratio of ceded reinsurance. The study is based on secondary data of 16 insurance companies with 124 observations for the period from 2013/14 to 2020/21. The data are collected from the annual reports of the selected insurance companies and annual report published by Rastriya Beema Samiti. The regression models are estimated to test the significance and effect of firm specific factors and reinsurance on performance of Nepalese insurance companies.

The study shows that firm size, liquidity, net claim ratio and net commission ratio have negative impact on performance measured by return on assets and return on equity of Nepalese insurance companies. However, the study shows that, assets tangibility and ratio of ceded reinsurance have positive impact on insurance companies' performance proxied by return on assets and return on equity. Finally, the study concludes that ratio of ceded reinsurance is the most influencing factor followed by net commission ratio, assets tangibility, liquidity and firm size that determines the changes in return on assets of insurance companies. The study also concludes that assets tangibility, net commission ratio, net claim ratio and ratio of ceded reinsurance are the major determinants of return on equity of Nepalese insurance company.

Key words: Firm size, liquidity, assets tangibility, net claim ratio, net commission ratio, ratio of ceded reinsurance, return on assets and return on equity.

I. Introduction

The insurance industry is essential to the economy because it makes easier to engage in risky but lucrative business initiatives. According to Abass (2019) just as individuals, companies or businesses seek protection for their loss exposures, insurance companies also need similar

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protection for losses that exceed their retention limit or are unexpected and catastrophic. Insurance companies spread their risks and protect themselves against extraordinary or unforeseen losses through reinsurance (Soye *et al.*, 2017). Aduloju and Ajemunigbohun (2017) established that, reinsurers are at the pinnacle of insurance market environment, because the abilities of reinsurers may bring about financial unrest within the insurance industry, which could result in spillover effect in the entire economy.

According to Owolabi *et al.* (2017), financial performance of insurance companies is very vital not only to their continuous operations but to economy development of the Nation at large. Similarly, Ahamad *et al.* (2010) stated due to the acceptance of risks, the insurance industry is crucial for corporate improvement. Insurance companies accepts risks in return for premium (Morara and Sibindi, 2021). Abass and Obalola (2018) stressed that, reinsurance arrangement is fundamental to insurance companies' operations because it serves as a major risk management mechanism often used to cushion loss experience. An understanding of the reinsurance-profitability relationship assists management and risk managers to better price and determine the ratio of gross premium to be ceded to achieve target returns. So, general insurance companies need to practice prudence in their operations in order to sustain their growth and improve performance (Almajali *et al.,* 2012).

Ajao and Ogricriakhil (2018) found the firm size has negative and significant relationship with return on equity while capital structure and firm age have a positive and significant influence on the financial performance of insurance companies in Kenya. Likewise, Abhubakar *et al.* (2018) revealed firm size has positive and significant relationship with performance measured in term of return on equity while liquidity and age have significant negative impact on financial performance. Size of the insurance companies and ratio of ceded reinsurance have positive relationship with financial performance and stability of central and eastern European countries (Kramaric *et al.*, 2019). Tegegn *et al.* (2020) found premium growth rate and size, are positively related but in contrast liquidity and age negatively but significantly related with profitability of Ethiopian insurance companies. Similarly, Eladly (2022) revealed the natural logarithm of total assets has positive and significant relationship with return on assets. Firm size, Gross domestic product, the population growth rates, political stability, all lead to higher profitability in the Serbian insurance industry (Vojinovic *et al.,* 2022).

Bishaw *et al.* (2019) found that firm size, leverage and liquidity have positive and significant relationship with return on equity while company size has negative and significant relationship and liquidity has positive and significant relationship with return on assets. Similarly, Abebe and Abera (2019) revealed capital adequacy, firm size and liquidity have positive and significant relationship with both return on assets and return on equity while age of the company has negative and significant relationship with performance of insurance companies. Firm size, liquidity and leverage have positive and insignificant relationship with profitability of the insurance companies (Hemza *et al.*, 2020). Liquidity has positive and significant relationship with performance of insurance companies and expenses ratio has negative and significant

while leverage and loss ratio have negative and insignificant relationship with performance measured by return on assets (Ngunguni *et al.*, 2020). However, Bala *et al.* (2022) further revealed that, liquidity and premium to assets ratio have negative and significant relationship while size of the firm has positive and significant relationship with performance of the Nigerian insurance companies.

Derbali and Jamel (2018) found firm size has positive and significant relationship and assets tangibility and liquidity have positive and insignificant relationship while age of firm and premium growth rate have positive and significant relationship with performance measured by return on assets. Similarly, Balakrishan (2019) revealed firm size, tangibility of asset, firm growth and premium growth have positive while leverage and loss ratio/risk have negative relationship with profitability. Assets tangibility, market share, net premium, insurance leverage and gross domestic products are insignificantly and negatively related and liquidity, underwriting risk, debt to equity, equity capital, capital surplus and inflation are positively and significantly related with return on assets (Istiaq and Siddiqui, 2019). Company size and the liquidity ratio are positively and insignificantly associated with profitability and on the contrary, the loss ratio, liabilities ratio, insurance leverage ratio, and to a less extent, the company age has negative effects on the profitability of Saudi insurance companies (Ben Dhiab, 2021) Likewise, Shahi and Agnihotri (2022) found assets tangibility and firm size have positive while leverage have negative relationship with profitability of insurance companies. Also, Liquidity has negative and insignificant relationship meanwhile firm size has positive and insignificant relationship in performance.

Putra (2017) found the claim ratio has negative and significant relationship with the performance of the insurance companies measured in the form of return on assets. Similarly, Srijanani and Rao (2019) revealed claim ratio has negative and significant relationship while liquidity ratio has positive and significant relationship with return on equity. Also, Gross domestic product, share capital and solvency ratio have positive but insignificant relationship with ROE while inflation has negative and insignificant relationship with firm performance. Total claim has direct and significant effect on return on asset, expense ratio has positive with an insignificant effect on return on asset and claim loss ratio has an indirect with an insignificant effect on return on asset of quoted insurance firms in Nigeria (Olarinre *et al.,* 2020). Claim ratio and operating expense ratio have negative and significant effect on profitability while retention ratio has positive and not significant effect on profitability. Furthermore, Claim ratio, operational expense ratio and retention ratio together have a significant effect on company profitability (Hasibuan *et al.*, 2020).Bunyaminu *et al.* (2022) found the claim ratio and retention ratio have a profound adverse impact on return on asset and claim ratio and expense ratio negatively and significantly affect profitability in term of return on equity and in contrast firm size has negative and insignificant relationship with both return on assets and return on equity.

Wasike and Ngoya (2016) found that claims costs, reinsurance cost, and market penetration were negatively and insignificantly related to profitability whilst commission expenses was

positively and significantly related to profitability. Similarly, Mazvoina *et al.* (2017) revealed that commission expense ratio, net claims ratio and the size of a company significantly affect insurance companies' performance negatively whilst leverage and liquidity affect performance positively. Ratio of ceded reinsurance has positive and significant relationship while net commission ratio has positive but insignificant relationship with return on assets and return on equity but Net claim ratio and net retention ratio both have negative and significant relationship with performance of Nigerian insurance companies (Salaudeen *et al.,* 2021). Likewise, Amarasena (2021) revealed that the net claims ratio has a significantly negative effect while the ceded reinsurance ratio has a significantly positive effect on the performance of general insurance companies. Further, the net commission ratio has a positive effect, while the retention ratio negatively affects general insurance companies' performance. Claim settlement ratio, commission expenses ratio and operating expenses ratio have negative and significant relationship with return on equity (Thirupathi and Subhashini, 2022).

Aduloju and Ajemunigbohun (2017) revealed that ratio of ceded reinsurance has positive and significant relationship with both return on assets and return on equity. Likewise, Deyganto and Alemu (2019) ratio of ceded reinsurance and firm size have positive and insignificant relationship while net claim ratio has negative and significant relationship with performance. Furthermore, premium growth, solvency ratio, growth rate of gross domestic product, and inflation rate have significant effect on financial performance of the insurance companies. Ratio of ceded reinsurance has positive and no significant influence on profitability measured in term of return on assets and return on equity but reinsurance dependence ceded premium has positive and significant relationship with return on assets and return on equity (Abass, 2019). Similarly, Andoh and Yamoah (2021) found ratio of ceded reinsurance has negative and insignificant relationship with profitability measured in term of return on assets but solvency ratio, firm size, combined ratio all have negative and significant relationship with return on assets. Likewise, Barakat *et al.* (2022) positive and statistically insignificant impact of ratio of ceded reinsurance with return on assets while ratio of ceded reinsurance has negative and insignificant relationship with return on equity.

In the context of Nepal, Jaishi (2020) found that the firm size and liquidity have negative and significant relationship with return on assets while total debt ratio, equity to total assets ratio, leverage, size, liquidity and tangibility are the significant factors in determining the financial performance of Nepalese insurance companies. However, Risal (2020) revealed liquidity and net claim ratio has negative and insignificant relationship but leverage has negative and significant relationship with return on assets. Liquidity has positive and significant relationship while firm size, firm age, total debt and leverage all have insignificant relationship with profitability of insurance companies (Hamal, 2020). Similarly, Bhattarai (2020) revealed financial leverage and size of the firm has positive and significant relationship with the performance measured in term of return on equity. Insurance premium positively and significantly affects the return on assets (Pradhan and Dahal, 2021).

Bastola *et al.* (2022) found the firm size has positive and insignificant relationship with return on assets. In contrast, Mahato and Pradhan (2022) revealed the firm size has negative and insignificant while liquidity has negative and significant relationship with return on assets. Likewise, Sah and Magar (2021) found the positive and significant impact of firm size and assets tangibility on return on assets of Nepalese insurance companies. Panth *et al.* (2022) revealed the firm size has positive and significant while leverage has negative and insignificant relationship with performance of Nepalese insurance companies measured by return on assets and return on equity. Similarly, Jaishi and Poudel (2021) found the firm size and liquidity both have negative relationship with return on assets where firm size is significant but liquidity is insignificant. Also, tangibility has positive but insignificant relationship with performance measured in return on assets.

The conclusion generated from the findings of the above literature is that there is no consistency of relationship and impact of selected independent variables such as firm size, liquidity, assets tangibility, net claim ratio, net commission ratio and ratio of ceded reinsurance on performance peroxided by return on assets and return on equity. The findings of the discussed studies cannot be generalized. So, there is need for a separate study in the context of Nepal to identify the relationship and impact of the independent variables on the performance of Nepalese insurance companies so that it will be useful and beneficial for researchers, practitioners and other interested parties to develop an understanding and for efficient management of insurance companies. Hence, this study is conducted to reveal the effect of firm specific factors and reinsurance on performance of Nepalese insurance companies.

The above discussion shows that empirical evidences vary greatly across the studies concerning examines the impact of firm specific factors and reinsurance on performance of insurance companies. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to identify the determinants of market stock price movements in Nepalese insurance companies. Specifically, it examines the relationship of firm size, liquidity, assets tangibility, net claim ratio, net commission ratio and ratio of ceded reinsurance with return on assets and return on equity of Nepalese insurance companies.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

II. Research Methodology

The study is based on the secondary data which were collected from 16 Nepalese insurance companies from 2013/14 to 2020/21, leading to a total of 124 observations. The main sources of data include annual reports of Rastriya Beema Samiti and annual reports of selected

Nepalese insurance companies. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of insurance companies selected for the study along with the study period and number of observations.

Table 1

List of insurance companies selected for the study along with study period and number of observations

S. N.	Name of the insurance companies	Study period	Observations
Life Insurance Companies			
1	National Life Insurance Company	2013/14 - 2019/20	7
2	Nepal Life Insurance Company	2013/14 - 2020/21	8
3	Life Insurance Corporation (Nepal)	2013/14 - 2019/20	7
4	Met Life Insurance Company	2013/14 - 2020/21	8
5	Asian Life Insurance Company	2013/14 - 2020/21	8
6	Surya Life Insurance Company	2013/14 - 2020/21	8
7	Gurans Life Insurance Company	2013/14 - 2019/20	7
8	Prime Life Insurance Company	2013/14 - 2019/20	7
Non-life Insurance Companies			
9	United Insurance Company	2013/14 - 2020/21	8
10	Premier Insurance Company	2013/14 - 2020/21	8
11	Neco Insurance Limited	2013/14 - 2020/21	8
12	Sagarmatha Insurance Company	2013/14 - 2020/21	8
13	Prabhu Insurance Limited	2013/14 - 2020/21	8
14	IME General Insurance Company	2013/14 - 2020/21	8
15	Prudential Insurance Limited	2013/14 - 2020/21	8
16	Lumbini General Insurance Company	2013/14 - 2020/21	8
	Total number of observations		**124**

The Model

The model in this study assumes that the insurance companies' performance depends on different variables. The dependent variables are return on assets and return on equity. The selected independent variables are firm size, liquidity, assets tangibility, net claim ratio, net commission ratio and ratio of ceded reinsurance. Therefore, the model takes the following forms:

$$ROA_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 LIQ_{it} + \beta_3 AT_{it} + \beta_4 NCLM_{it} + \beta_5 NCOM_{it} + \beta_6 RCR_{it} + e_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 LIQ_{it} + \beta_3 AT_{it} + \beta_4 NCLM_{it} + \beta_5 NCOM_{it} + \beta_6 RCR_{it} + e_{it}$$

Where,

ROA = Return on assets as measured by the ratio of net income to total assets, in percentage.

ROE = Return on equity as measured by the ratio of net income to total equity, in percentage.

FS = Firm size of insurance company measured in natural logarithm of total assets.

LIQ = Liquidity ratio as measured by the ratio of current assets to current liabilities, in times.

AT = Assets tangibility ratio as measured by the total fixed assets to total assets, in percentage.

NCLM= Net claim ratio as measured by the ratio of net claim expenses to net premium earned, in percentage.

NCOM= Net commission ratio as measured by the ratio of gross commission expenses to gross premium earned, in percentage.

RCR = Ratio of ceded reinsurance as measured by the ratio of reinsurance premium paid to gross premium earned, in percentage.

e_{it} = Error term

The following section describes the independent variables used in this study along with the hypothesis formulation:

Firm Size

The concept of firm size is defined as the quantity and collection of production capability and potential a firm possesses or the quantity and diversity of services a firm can make available to its customers (Shaheen & Malik, 2012). Size of the firm has positive relationship with return on assets (Aryonindito *et al.,* 2020). Likewise, Eladly (2022) found the similar result where firm size has positive relationship with firm performance. The firm size positive and significant relationship with return on assets (Vojinvic *et al.,* 2022), Ahmeti and Iseni (2022) found that there is a positive and significant relationship between firm size and ROA. Based on it, this study develops the following hypothesis.

 H₁: There is a positive relationship between firm size and financial performance.

Liquidity

Liquidity for insurance companies shows the ability of insurers to pay current liabilities, which have the nature of operating expenses or payment of compensation in case of damage (Kripa, 2016). Abdeljawad *et al.* (2020) liquidity has positive and significant relationship with insurance companies' profitability. Similarly, Ngunguni *et al.* (2020) found liquidity has positive and significant relationship with performance measured in return on assets. Likewise, Tsvetkova *et al.* (2021) revealed liquidity affecting the performance in positive direction. Liquidity has positive and significant relationship with return on assets (Olowokudejo and Ajijola, 2022). Based on it, this study develops the following hypothesis.

 H₂: There is a positive relationship between liquidity and financial performance.

Assets Tangibility

Tangibility entails fixed assets; it is also termed as plants and machinery in financial statements of companies (Ajao and Ogieriakhi, 2018). It measures how efficiently firm is using its fixed assets to earn the profit. Isayas and Yitayaw (2020) found assets tangibility as positive and significant predictor of the firm performance. Similarly, Ben Dhiab (2021) determined the profitability is most significantly and positively affected by the assets tangibility of the firm. Likewise, Lalon and Das (2022) found tangibility of assets as most significant and positive divers on profitability. There is a positive and significant relationship between tangibility of the assets and profitability measured in term of return on assets and return on equity (Shiferaw and Gujral, 2022). Based on it, this study develops the following hypothesis.

 H_3: There is a positive relationship between assets tangibility and financial performance.

Net claim ratio

The claims ratio is measured by the number of claims in a period divided by the total premiums earned for the same period (Barakat *et al.,* 2022). It is the risk that the premiums collected will not be sufficient to cover the cost of coverage (Malik, 2011). Azmi *et al.* (2020) found net claim ratio has negative and significant relationship with firm profitability. Hasibuan *et al.* (2020) concluded that net claim ratio has negative and significant relationship with profitability. Tarsona *et al.* (2020) also found the negative and significant relationship between financial performance and net claim ratio in insurance companies. Net claim ratio has negative and significant relationship with financial performance of the insurance companies (Legass *et al.,* 2021). Bunyaminu *et al.* (2022) explored that net claim ratio has negative and insignificant relationship with performance measured in term of return on assets and return on equity. Based on it, this study develops the following hypothesis.

 H_4: There is a negative relationship between net claim ratio and financial performance.

Net commission ratio

Thurupathi and Subhashuni (2022) defined net commission ratio as net commission expenses divided by net earned premium. Soye and Adeyemo (2017) found the negative and insignificant relationship between net commission ratio and return on assets. Similarly, Muthulakshmi (2018) found commission expenses as the negative and significant predictor of the performance of insurance companies. Commission expenses ratio has a negative and insignificant relationship with performance measured with return on assets (Hussaunie and Joo, 2019). Commission expenses ratio has negative and significant relationship with financial performance of insurance companies (Thirupathi and Subhashini, 2022). Based on it, this study develops the following hypothesis.

 H_5: There is a negative relationship between net commission ratio and financial performance.

Ratio of cede reinsurance

Ratio of ceded reinsurance is one of the ways in which insurance companies effectively transfer parts of their risks arising from insurance claims (Barakat *et al.,*2022). Abass (2019) revealed that the ratio of ceded reinsurance has a positive relationship with firm performance measured in term of return on assets and return on equity. Meanwhile, ratio of ceded reinsurance has positive and significant relationship with insurance company's financial performance (Sasidharan *et al.,* 2020). Similarly, Morara and Sibindi (2021) found the ratio of ceded reinsurance has positive and significant relationship with performance measured in term of return on equity (ROE). Likewise, Soye *et al.* (2022) found ratio of ceded reinsurance has positive and significant relationship with performance of the non-life insurance firms' profitability. Based on it, this study develops the following hypothesis.

 H_6: *There is a positive relationship between ratio of ceded reinsurance and financial performance.*

III. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2013/14 to 2020/21.

Table 2

Descriptive statistics

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	-2.83	12.05	4.98	3.40
ROE	-17.29	53.66	17.17	9.89
FS	19.97	25.57	22.34	1.26
LIQ	0.82	16.68	4.34	3.74
AT	0.14	15.99	3.01	3.01
NCLM	3.02	90.56	22.67	11.79
NCOM	1.08	20.61	7.03	4.44
RCR	0.19	74.04	27.56	25.09

The table 2 shows the descriptive statistics of dependent and independent variables of 16 Nepalese insurance companies for the study period from 2013/14 to 2020/21. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are FS (Firm size as measured by the natural logarithm of total assets), LIQ (Liquidity ratio as measured by the ratio of current assets to current liabilities, in times), AT (Assets tangibility ratio as measured by the total fixed assets to total assets, in percentage), NCLM (Net claim ratio as measured by the ratio of net claim expenses to net premium earned, in percentage), NCOM (Net commission ratio as measured by the ratio of gross commission expenses to gross premium earned, in percentage) and RCR (Ratio of ceded reinsurance as measured by the ratio of reinsurance premium paid to gross premium earned, in percentage).

Clearly, return on assets ranges from a minimum of -2.83 percent to a maximum of 12.05 percent, leading to an average of 4.98 percent. The average return on equity of the Nepalese insurance companies during the study period ranges from a minimum of -17.29 percent to a maximum of 53.66 percent, leading to an average of 17.17 percent. The average firm size ranges from a minimum of 19.97 to a maximum of 25.57, leading to an average of 22.34. The average liquidity ratio ranges from minimum of 0.82 times to a maximum of 16.68 times, leading to the average of 4.34 times. Likewise, the assets tangibility ranges from minimum of 0.14 percent to a maximum of 15.99 percent, leading to an average of 3.01 percent. Similarly, the average net claim ratio ranges from a minimum of 3.02 percent to a maximum of 90.56 percent, leading to an average of 22.67 percent. However, the average net commission ratio varies from a minimum of 1.08 percent to a maximum of 20.61 percent, leading to an average of 7.03 percent. The average ratio of ceded reinsurance varies from a minimum of 0.19 to a maximum of 74.04, leading to an average of 27.56.

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3. This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 16 Nepalese insurance companies for the study period from 2013/14 to 2020/21. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are FS (Firm size as measured by the natural logarithm of total assets), LIQ (Liquidity ratio as measured by the ratio of current assets to current liabilities, in times), AT (Assets tangibility ratio as measured by the total fixed assets to total assets, in percentage), NCLM (Net claim ratio as measured by the ratio of net claim expenses to net premium earned, in percentage), NCOM (Net commission ratio as measured by the ratio of gross commission expenses to gross premium earned, in percentage) and RCR (Ratio of ceded reinsurance as measured by the ratio of reinsurance premium paid to gross premium earned, in percentage).

Table 3

Pearson's correlation coefficients matrix

Variables	ROA	ROE	FS	LIQ	AT	NCLM	NCOM	RCR
ROA	1							
ROE	0.78**	1						
FS	-0.35**	-0.02	1					
LIQ	-0.21*	-0.06	0.49**	1				
AT	0.52**	0.35**	-0.41**	-0.33**	1			
NCLM	-0.28**	-0.27**	-0.01	-0.20*	0.01	1		
NCOM	-0.57**	-0.28**	0.54**	0.55**	-0.45**	-0.18*	1	
RCR	0.60**	0.27**	-0.68**	-0.60**	0.48**	-0.03	-0.85**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent respectively.

Table 3 shows that firm size has a negative relationship with return on assets. It means that increase in firm size leads to decrease in return on assets. Likewise, there is a negative relationship between liquidity ratio and return on assets. It means that increase in liquidity ratio leads to decrease in return on assets. In contrast, assets tangibility has a positive relationship with return on assets. It shows that higher the assets tangibility, higher would be the return on assets. However, there is a negative relationship between net claim ratio and return on assets. It indicates that increase in net claim ratio leads to decrease in return on assets. In addition, net commission ratio has a negative relationship with return on assets. It indicates that increase in net commission ratio leads to decrease in return on assets. Further, this study shows that there is a positive relationship between ratio of ceded reinsurance and return on assets. It means that larger the insurance company size in terms of assets, higher would be the return on assets.

Similarly, the result also shows that firm size has a negative relationship with return on equity. It means that increase in firm size leads to decrease in return on equity. Likewise, there is a negative relationship between liquidity ratio and return on equity. It means that increase in liquidity ratio leads to decrease in return on equity. In contrast, assets tangibility has a positive relationship with return on equity. It shows that higher the assets tangibility, higher would be the

return on equity. However, there is a negative relationship between net claim ratio and return on equity. It indicates that increase in net claim ratio leads to decrease in return on equity. In addition, net commission ratio has a negative relationship with return on equity. It indicates that increase in net commission ratio leads to decrease in return on equity. Further, this study shows that there is a positive relationship between ratio of ceded reinsurance and return on equity. It means that larger the insurance company size in terms of equity, higher would be the return on equity.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4. More specifically, it shows the regression results of firm size, liquidity ratio, assets tangibility, net claim ratio, net commission ratio and ratio of ceded reinsurance with return on asset of Nepalese insurance companies.

The results of table 4 are based on panel data of 16 insurance companies with 124 observations for the period of 2013/14-2020/21 by using the linear regression model and the model is $ROA_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 LIQ_{it} + \beta_3 AT_{it} + \beta_4 NCLM_{it} + \beta_5 NCOM_{it} + \beta_6 RCR_{it} + e_{it}$ where, the dependent variable is ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage). The independent variables are FS (Firm size as measured by the natural logarithm of total assets), LIQ (Liquidity ratio as measured by the ratio of current assets to current liabilities, in times), AT (Assets tangibility ratio as measured by the total fixed assets to total assets, in percentage), NCLM (Net claim ratio as measured by the ratio of net claim expenses to net premium earned, in percentage), NCOM (Net commission ratio as measured by the ratio of gross commission expenses to gross premium earned, in percentage) and RCR (Ratio of ceded reinsurance as measured by the ratio of reinsurance premium paid to gross premium earned, in percentage).

Table 4 shows that the beta coefficients for firm size are negative with return on assets. It indicates that firm size has a negative impact on return on assets. This finding is contradict to the findings of Ahmeti and Iseni (2022). The beta coefficients for liquidity are negative with return on assets. It indicates that liquidity ratio has a negative impact on return on assets. This finding is inconsistent with the findings of Ngunguni *et al.* (2020). Similarly, the beta coefficients for assets tangibility are positive with return on assets. It indicates that assets tangibility has a positive impact on return on assets. This finding is similar to the findings of Shahi and Agnihotri (2022). Likewise, the beta coefficients for net claim ratio are negative with return on assets. It indicates that net claim ratio has a negative impact on return on assets. This finding is consistent with the findings of Legass *et al.* (2021). Similarly, the beta coefficients for net commission ratio are negative with return on assets. It indicates that net commission ratio has a negative impact on return on assets. This finding is consistent with the findings of Hussanie and

Table 4

Estimated regression results of firm size, liquidity ratio, assets tangibility, net claim ratio, net commission ratio and ratio of ceded reinsurance with return on asset

Models	Intercepts	Regression coefficients of						Adj. R_bar 2	SEE	F-value
		FSZ	LIQ	AT	NCLIM	NCOM	RCR			
1	25.956 (5.088)**	-0.939 (4.118)**						0.115	3.198	16.955
2	5.815 (12.644)**		-0.192 (2.387)**					0.037	3.337	5.695
3	3.206 (8.671)**			0.591 (6.79)**				0.268	2,908	46.107
4	6.834 (10.693)**				-0.082 (3.263)**			0.073	3.274	10.644
5	8.074 (17.104)**					-0.439 (7.735)**		0.324	2.7963	59.827
6	2.749 (7.516)**						0.081 (8.24)**	0.352	2.737	67.891
7	24.631 (4.323)**	-0.87 (3.313)**	-0.047 (0.529)					0.110	3.208	8.567
8	15.30 (3.13)**	-0.448 (2.11)*		0.518 (5.85)**	-0.08 (3.99)**		15.30 (3.13)**	0.364	2.711	24.44
9	14.201 (2.743)**	-0.384 (1.641)	-0.049 (0.622)	0.508 (5.626)**	-0.086 (4.021)**			0.361	2.718	18.337
10	8.66 (6.38)**			0.33 (4.20)**	-0.011 (5.52)**	-0.035 (3.68)**	0.008 (0.45)	0.54	2.30	37.17
11	9.16 (12.29)**			0.34 (4.38)**	-0.11 (6.06)**	-0.389 (7.31)**		0.544	2.30	49.82

Notes:
1. *Figures in parenthesis are t-values.*
2. *The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.*
3. *Credit rating is the dependent variable*

Joo (2019). Likewise, the beta coefficients for ratio of ceded reinsurance are positive with return on assets. It indicates that ratio of ceded reinsurance has a positive impact on return on assets. This finding is similar to the findings of Soye *et al.* (2022).

Table 5

Estimated regression results of firm size, liquidity ratio, assets tangibility, net claim ratio, net commission ratio and ratio of ceded reinsurance with return on equity

Models	Intercepts	Regression coefficients of						Adj. R_bar²	SEE	F-value
		FSZ	LIQ	AT	NCLIM	NCOM	RCR			
1	20.326 (1.283)	-0.141 (0.199)						0.008	9.933	0.040
2	17.847 (13.056)**		-0.155 (0.65)					0.005	9.918	0.423
3	13.709 (11.591)**			1.152 (4.14)**				0.116	9.302	17.118
4	22.364 (11.986)**				-0.229 (3.13)**			0.067	9.558	9.815
5	21.577 (13.404)*					-0.626 (3.231)**		0.071	9.536	10.439
6	14.235 (11.132)*						0.107 (3.10)**	0.065	9.565	9.619
7	28.88 (12.18)**				-0.028 (4.01)**	-0.76 (4.10)**		0.173	8.99	13.91
8	24.20 (8.52)**			0.83 (2.82)**	-0.26 (3.87)**	-0.50 (2.74)*		0.22	8.75	12.46
9	29.73 (5.79)**			0.90 (3.03)**	-0.30 (4.09)**	-0.89 (2.45)*	0.08 (1.29)	0.22	8.72	9.82
10	13.66 (3.06)**		-0.15 (1.82)	0.95 (3.01)**		-0.378 (1.07)	0.04 (0.62)	0.14	9.19	5.91
11	25.34 (1.64)	-0.133 (0.19)			-0.229 (3.12)**			0.059	9.60	4.89

Notes:

   i.   *Figures in parenthesis are t-values.*
   ii.   *The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.*
   iii. *Return on equity is the dependent variable.*

The results of table 5 are based on panel data of 16 insurance companies with 124 observations for the period of 2013/14-2020/21 by using the linear regression model and the model is $ROE_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 LIQ_{it} + \beta_3 AT_{it} + \beta_4 NCLM_{it} + \beta_5 NCOM_{it} + \beta_6 RCR_{it} + e_{it}$ where, the dependent variable is ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage). The independent variables are FS (Firm size as measured by the natural logarithm of total assets), LIQ (Liquidity ratio as measured by the ratio of current assets to

current liabilities, in times), AT (Assets tangibility ratio as measured by the total fixed assets to total assets, in percentage), NCLM (Net claim ratio as measured by the ratio of net claim expenses to net premium earned, in percentage), NCOM (Net commission ratio as measured by the ratio of gross commission expenses to gross premium earned, in percentage) and RCR (Ratio of ceded reinsurance as measured by the ratio of reinsurance premium paid to gross premium earned, in percentage).

Table 5 shows that the beta coefficients for firm size are negative with return on equity. It indicates that firm size has a negative impact on return on equity. This finding is similar to the findings of Ajao and Ogicriakhil (2018). Similarly, the beta coefficients for liquidity ratio are negative with return on equity. It indicates that liquidity ratio has a negative impact on return on equity. This finding is consistent to the findings of Bala *et al.* (2022). Likewise, the beta coefficients for assets tangibility are positive with return on equity. It indicates that assets tangibility has a positive impact on return on equity. This finding is similar with the findings of Shiferaw and Gujral (2022). Moreover, the beta coefficients for net claim ratio are negative with return on equity. It indicates that net claim ratio has a negative impact on return on equity. This finding is similar to the findings of Bunyaminu *et al.* (2022). Similarly, the beta coefficients for net commission ratio are negative with return on equity. It indicates that net commission ratio has a negative impact on return on equity. This finding is consistent with the findings of Thirupathi and Subhashini (2022). Likewise, the beta coefficients for ratio of ceded reinsurance are positive with return on equity. It indicates that ratio of ceded reinsurance has a positive impact on return on equity. This finding is similar to the findings of Sasidharan *et al.* (2020).

IV. Summary and conclusion

This study examines the impact of firm specific factors and reinsurance on performance of Nepalese insurance companies. The study is based on secondary sources of data from 16 insurance companies with 124 observations for the period of 2013/14 to 2020/21. The dependent variables used in this study are return on assets and return on equity whereas the independent variables are firm size, liquidity, assets tangibility, net claim ratio, net commission ratio and ratio of ceded reinsurance.

The result shows that firm size and liquidity have a negative impact on return on assets and return on equity. It indicates that the increase in firm size and liquidity ratio of insurance companies leads to decrease in return on assets and return on equity of Nepalese insurance companies. Similarly, the study showed that net claim ratio and net commission ratio have a negative impact on return on assets and return on equity. It means that increase in net claim ratio and net commission ratio leads to decrease in return on assets and return on equity of insurance companies in Nepal. Moreover, the study also showed that assets tangibility and ratio of ceded reinsurance have a positive impact on return on assets and return on equity. It indicates that the increase in assets tangibility and ratio of ceded reinsurance leads to increase in return on assets and return on equity of Nepalese insurance companies.

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