Vol. 1, Issue 11 | Nov 2026 | Open Access — Original Research Article

REINSURANCE CESSION, UNDERWRITING MARGINS AND PROFITABILITY: A CENSUS OF LISTED INSURERS IN BANGLADESH

Najifa Tasneem Teesha*

Department of Finance, Southeast Business School, Southeast University, Dhaka, Bangladesh

*Corresponding author: Najifa Tasneem Teesha, A3 City Axis Quaderia, 34 Segun Bagicha, Dhaka-1000, Bangladesh.
Email: najifa_teesha@hotmail.com | ORCID: https://orcid.org/0009-0008-2029-767X

***Abstract*—**This study reveals the profitability and reinsurance practice/policies of the listed companies of Bangladesh from 2021 to 2024 and how their growth has been turning. The financial data is hand-compiled from all 58 listed insurers' annual reports (43 non-life, 15 life). Each entry was put into a standard unit and checked for consistency across itself, and entries which failed this test were not corrected, and 33 non-life (131 company-years) and nine life insurers were analysed. The median non-life ROA decreased from 6.3% in 2021 to 4.3% in 2024 (Wilcoxon signed-rank p = .005), and the median underwriting margin decreased from 26% to 17%. The insurers that shared a higher percentage of premium with reinsurers achieved lower ROA: an increase of 0.7 percentage points in ROA per 10 percentage points increase in cession ratio (wild cluster bootstrap p = .025). The association is lost when adding fixed effects (p = .84), indicating an association that is persistent between insurers rather than the effect of an insurer changing the insurer that they are changing. Life is much more focused than non-life – the 3 largest of the 9 retained life insurers account for 77% of premium. Results are associations in a short panel and are not causal estimates.

Index Terms*—Insurance Profitability, Reinsurance, Return on Assets, Market Concentration, Bangladesh, Life and Non-Life Insurance.*

I. INTRODUCTION

Insurers make profit from underwriting and from investment, and manage risk by retaining some and transferring the remainder to reinsurers to retain that risk. The answer is an empirical question, and it depends on the market, which of these options separates the good from the bad insurers. It has been found that the size is a key factor in differentiating between healthy insurers and the less healthy ones (studies by Chen and Wong [1] on insurers in Asia); however, there is no basis for differentiating the performance of healthy insurers from weaker ones in Bermuda studies (Adams and Buckle [2] study). There is therefore no automatic transfer of findings between markets.

Bangladeshi evidence is based on small samples. Barua et al. [3] and Lalon [4] state that the number of non-life insurers selected in panel studies are 16 companies from 1999 to 2014 and 7 companies from 2011 to 2020 respectively, with the second finding no significant association between reinsurance dependence and profitability. Taiwan, on the other hand, is where Lee and Lee [5] found that the higher the reinsurance dependence, the worse the performance. The insurance sector is a competitive market in Bangladesh, where there are dozens of insurance companies and a study on all of the listed insurance firms and not just a few can contribute meaningful information.

The following article will examine four questions:

(i) What is the trend in the profitability and cost structure for the listed non-life sector from 2021 to 2024?

(ii) Is there an association between the use of reinsurance and profitability and is this association a difference between firms and/or a change in the firm?

(iii) How high is the concentration of the non-life and life segments and how fast do these segments grow?

(iv) What is the sensitivity of the conclusions to the quality of the financial information?

The study makes three contributions:

- The sample is drawn from the full population of listed insurers, and includes 33 non-life insurers, compared with the panels of Bangladeshi non-life insurers listed above.
- Separates the between-firm from the within-firm variation of the cession–profitability relationship.
- It says how much conclusions depend on screening decisions; because the raw data were manually gathered from reports with varying format and units.

II. LITERATURE REVIEW

A. Reinsurance and Performance

Mayers and Smith [6] use the example of the demand for reinsurance of property–casualty insurance for firms and demonstrate that ownership structure, firm size, geographic concentration, and the concentration of line of business affect the amount of reinsurance that a property–casualty insurance firm buys. Cole and McCullough [7] re-studied the causes of that demand. Based on statutory returns for non-life insurers in the UK for the period 1985 to 2002, Shiu [8] finds that, as expected, insurers with higher leverage purchase more reinsurance, and studies the reverse causation from

reinsurance to the capital structure, which is consistent with reinsurance and balance-sheet choices being interdependent.

The most recent study that is most similar to this is the analysis of Taiwanese property–liability insurers performed by Lee and Lee [5] for the years 1999–2009. They discover that the higher an insurer's ROA, the less reinsurance it buys, and the higher an insurer's reinsurance dependence, the worse its performance, thus there is a tradeoff between lower insolvency risk and lower potential profitability. About 42% of the premium in the Taiwanese sample studied here is sacrificed in the Taiwanese market, a figure close to the median of the 40% mean of the Bangladeshi sample.

B. Other Determinants of Insurer Performance

In the case of Asian general insurers, size, investment performance, liquidity, growth in surplus, combined ratio and operating margin are significant, while for life insurers the factors are size, change in asset mix, investment performance and change in product mix, according to Chen and Wong [1]. In contrast to their expectation, Adams and Buckle [2] show that less liquid companies perform better and that performance is positively correlated with underwriting risk for Bermuda. Barua et al. [3] employ static and dynamic panels in Bangladesh, and find that the ratio of investment to sales positively affects profitability, and that minimizing underwriting mistakes would enhance that profitability. The leverage and size are reported to be significant by Lalon [4], while there is no significant relation between profitability and reinsurance dependence.

C. Hypotheses

H1. An increasing cession ratio is correlated with a decreasing ROA as premium and margin are taken off by reinsurers and a higher cession ratio could indicate lower capital or underwriting [5], [8]. If reinsurance and performance are both judged, they are tested both between firms and intra-firm.

H2. A higher claim ratio and expense ratio are related to lower ROA [1], [3].

H3. There is a positive correlation between investment yield of the company and ROA [1], [3].

H4. The size of the company is associated with ROA. Previous research contradicts this [1], [2], [4] and there is no prediction of a sign.

III. DATA AND METHODOLOGY

A. Population and Source

The study includes all the insurers available in Bangladesh; 58 insurers, including 43 non-life business and 15 life business. The financial data have been hand-compiled from the published annual reports of each company, for 11 items (gross premium, reinsurance ceded, net premium income, net claims paid, outstanding-claims liability, management expenses, agency commission, underwriting profit, investment income, net profit after tax and total assets) over five fiscal years (2021-2025). The analysis period is 2021-2024 (232 company-years) because only 10 records have a value for 2025.

B. Standardisation and Consistency Checks

There are different ways of expressing numbers in the reports such as Indian digit grouping ("1,03,40,648"), different thousands and decimal separators, unit suffixes ("million, billion, Tk") and unlabeled millions. Entries were all converted to BDT million using a parser and text flags, percentages, ranges and partial-period figures were coded as missing. The converted data was then checked for internal consistency, and the data which failed was not corrected and not used in the affected calculations.

TABLE I. CONSISTENCY CHECKS ON THE COMPILED DATA

Check	Result
Company-years in window (2021–2024)	232
Complete on eight core variables	161 (69%)
Most-missing variables	Outstanding claims 25%, underwriting profit 21%, commission 19%
Records where gross − ceded differs from net premium by more than 10% of gross	40 of 192 (21%)
Duplicated data blocks	Central and Eastern; Rupali Life and Sunlife; Prime Islami General 2021
Columns that contradict each other	Takaful Islami, Federal, Dhaka (gross below net premium in 2021–22)
Single-year company	Fareast Islami Life
Companies with near-uniform growth in every line item	6

The purpose of the last check is as follows. The year-on-year growth rates of all eleven items were pooled (33 observations per company) for each company. The standard deviation of these rates for Purabi General, Reliance, Pragati Insurance, Popular Life, Pioneer and Green Delta is less than 3 percentage points and 20 points or more for some of the other companies. This is not a consistent pattern to be expected in reality when claims, expenses and investment income are not moving in sync, nor is it a consistent pattern one would expect in real firm behaviour. The six firms are not included in the main sample, but only for sensitivity check purposes.

C. Analysis Samples

The main sample consists of 131 company-years (33 of the 43 listed non-life insurers) with the remaining 10 in the duplicated, contradictory or uniform-growth groups above. The regression models are calculated using only records that pass the premium check; implausible values are missing (Appendix A) and result in 77–85 observations for 23–24 firms. Total assets of the retained non-life companies range from BDT 0.9 billion to BDT 3.0 billion, so the descriptions apply to the mid-sized non-life companies. There are nine insurers for the life sample that have premium series that can be used.

D. Variables

Claims are claims paid, not incurred, so the claims ratio is a cash-based proxy for loss experience.

TABLE II. VARIABLE DEFINITIONS

Variable	Definition
ROA	Net profit after tax ÷ year-end total assets
Cession ratio	Reinsurance ceded ÷ gross premium
Claims ratio	Net claims paid ÷ net premium income
Management expense and commission ratios	Each item ÷ net premium income
Combined ratio (paid basis)	Claims + management expense + commission ratios
Underwriting margin	Underwriting profit ÷ net premium income
Investment yield	Investment income ÷ year-end total assets
Size	Natural log of total assets (BDT million)
Market share, HHI	Firm gross premium ÷ segment total; sum of squared shares × 10,000

TABLE III. DESCRIPTIVE STATISTICS, MAIN NON-LIFE SAMPLE, 2021–2024 (BEFORE WINSORISING)

Variable	N	Mean	SD	Median	Min	Max
ROA (%)	113	5.3	2.2	4.8	0.7	12.4
Cession ratio (%)	90	38.7	10.8	40.0	13.7	68.3
Claims ratio (%)	85	23.6	18.1	19.8	0.0	116.9
Management expense ratio (%)	85	46.0	14.2	45.4	0.1	84.4
Commission ratio (%)	83	16.7	8.1	17.6	0.0	39.3
Underwriting margin (%)	87	23.6	10.1	21.9	0.3	48.1
Investment yield (%)	115	4.0	3.3	3.2	0.0	19.9
Total assets (BDT billion)	121	1.77	0.54	1.70	0.89	3.00

E. Estimation

The baseline is pooled ordinary least squares with year effects:

$$ROA_{it} = \alpha + \beta_1 Cession_{it} + \beta_2 Claims_{it} + \beta_3 Expense_{it} + \beta_4 lnAssets_{it} + \beta_5 Yield_{it} + \lambda_t + \varepsilon_{it} \quad (1)$$

Variables are winsorised at the 5th and 95th percentiles. The standard errors are grouped by company to enable the corporation's errors to be correlated across years. Conventional cluster-robust inference can over-reject, as mentioned by Cameron and Miller [9], so key coefficients are also tested using a wild cluster bootstrap-t with 4,999 replications of Rademacher noise and with the null imposed as stated by Cameron et al [10]. Since the differences in firms may be confounded with differences in period of measurement, the cession effect is re-estimated using company fixed effects.

The standard errors are not the sampling error from a firm draw as the data are (nearly) the entire listed population. They are not sure of the process that produces each firm's results from year to year, and the coefficients represent estimates of that process.

F. Diagnostics

All of the variance inflation factors in the fullest model are below 1.8 (maximum 1.72, management expense ratio). The baseline model has homoskedasticity ($p = .22$), which is not rejected by a Breusch–Pagan test. The Shapiro–Wilk test indicates that the ROA is not normally distributed ($p < .001$); hence group comparisons are made based on rank-based tests (Wilcoxon signed-rank, Kruskal–Wallis, Mann–Whitney).

IV. RESULTS AND DISCUSSION

A. Non-Life Profitability and Costs

Profitability fell and underwriting margins eroded while investment yields stayed flat (Table IV).

TABLE IV. MEDIAN RATIOS BY YEAR, MAIN NON-LIFE SAMPLE

Year	ROA	Underwriting margin	Claims ratio	Mgmt. expense ratio	Commission ratio	Combined ratio (paid)	Cession ratio	Investment yield
2021	6.3%	26.2%	19.4%	49.4%	11.7%	81.1%	40.6%	3.2%
2022	4.9%	24.3%	15.9%	45.0%	20.2%	81.1%	40.1%	2.4%
2023	4.3%	21.9%	22.2%	43.0%	18.9%	89.6%	41.0%	3.0%
2024	4.3%	17.5%	22.6%	45.8%	18.6%	86.1%	35.9%	3.5%

Note: 19–29 observations per cell, depending on the ratio.

For insurers observed in both years, median ROA fell from 6.3% in 2021 to 4.3% in 2024 (Wilcoxon signed-rank test, $n = 26$, $p = .005$) and from 6.4% to 4.3% between 2021 and 2023 ($n = 27$, $p < .001$). Further change from 2022 to 2024 is not significant ($p = .14$) and the majority of this decrease is between 2021–22. The 17 insurers that had data for both years saw a significant decline in their median underwriting margin from 25.9% to 17.1% ($p = .064$). Investment income did not compensate for weaker underwriting as the paid claims ratio increased to around 23% from 19% and the commission ratio increased following 2021, while investment yield remained close to 3%. The increase of the commission ratio from 2021 to 2022 needs to be interpreted with caution as the range of reporting companies varies from year to year.

The correlation of company ROA is 0.88 between 2023 and 2024, and 0.81 between 2022 and 2023, but drops to 0.38 between 2021 and 2024.

B. Reinsurance and ROA: Descriptive Evidence

About 40% (interquartile range 32% - 45%) of gross premium is ceded by the median non-life insurer. The gradient of ROA is apparent for the cession, and is almost

absent for the claims ratio (Table V) when the company-years are distributed in terciles.

TABLE V. ROA BY TERCILE OF CESSION RATIO (N = 85) AND OF CLAIMS RATIO (N = 81)

Tercile	Median cession ratio	Median ROA	Median claims ratio	Median ROA
Low	26.7%	6.2%	11.1%	4.8%
Middle	40.2%	4.2%	19.8%	4.6%
High	47.7%	4.5%	34.1%	4.5%

There are differences in ROA by cession tercile (Kruskal–Wallis p = .007) and the lowest-cession group had higher ROA than the highest-cession group (Mann–Whitney p = .001). Spearman rank correlations with ROA are −0.34 for cession (p = .001), −0.23 for the management expense ratio (p = .04), +0.39 for investment yield (p < .001) and −0.20 for firm size (p = .03).

C. Regression Results

Lower levels of cession are associated with higher ROA in all three pooled specifications, around −0.065 (Table VI).

TABLE VI. DEPENDENT VARIABLE: ROA. POOLED OLS WITH YEAR EFFECTS

Variable	Model 1	Model 2	Model 3
Cession ratio	−0.069** (0.024)	−0.067** (0.024)	−0.063* (0.035)
Claims ratio		−0.030* (0.015)	−0.024* (0.014)
Mgmt. expense ratio			−0.006 (0.026)
ln(Assets)	0.000 (0.010)	0.002 (0.010)	0.005 (0.011)
Investment yield		0.079 (0.071)	0.076 (0.086)
Observations	85	81	77
Companies	24	24	23
R^2	0.21	0.24	0.23

*Note: Company-clustered standard errors in parentheses. ** p < .05, * p < .10.*

For every one standard deviation increase in the cession ratio (approximately 11 percentage points), ROA is approximately 0.7 percentage points lower, but large relative to the median ROA of 4.8%. The claims ratio is expected to be negative as well, and has only a slight negative value, which is marginally significant; the management expense ratio and investment yield and size are not significant. This indicates that H1 is supported in the pooled data as well, but to a lesser extent in the case of H2 and to an even lesser extent in the case of H3 and H4. The absence of size effect is in line with Adams and Buckle [2], but the small size of the sample retained does not allow for extrapolation. Management expenses can be a minor factor as they are highly correlated with cession (Spearman correlation 0.55): high cession firms are also high cost firms, so there is a competition of both variables for the variation.

D. Sensitivity: Bootstrap, Fixed Effects and Screening Choices

The pooled cession result survives small-sample inference but disappears within firms and weakens when the six uniform-growth firms are added (Table VII).

TABLE VII. SENSITIVITY OF THE CESSION–ROA RELATIONSHIP

Check	Cession coefficient	p-value
Model 1, clustered standard errors	−0.069	.008
Model 1, wild cluster bootstrap-t	−0.069	.025
Model 2, wild cluster bootstrap-t	−0.067	.018
Model 1, no winsorising	−0.061	.013
Model 1, adding the six uniform-growth firms	−0.023	.38
Model 2, adding the six uniform-growth firms	−0.034	.16
Model 1, firm fixed effects	+0.007	.84
Model 2, firm fixed effects	+0.021	.60

Three results matter. First, the wild cluster bootstrap p-values (.025 and .018) are bigger than analytic ones but still smaller than .05, so the pooled result is not an artifact of having a small number of clusters as Cameron et al. [10] said. The claims-ratio coefficient is weaker with a bootstrap P value of .115. Second, after controlling for differences in company fixed effect, the cession coefficient is approximately zero, and is not statistically different from zero. A change in cession ratio by a single insurer doesn't necessarily lead to a predictable change in ROA. This concentration association is thus a between-firm association – in which low-cession insurers are consistently more profitable than high-cession insurers. Third, reintroducing the six uniform-growth firms brings the pooled coefficient back around to −0.03, which is not significant, and pulls the claims-ratio coefficient up to −0.045 (p = .008). The reinsurance result is thus sensitive to the firms that are retained. There is weak evidence of no effect in a null fixed-effects model, which is based on at most four years of data per company.

E. Cross-Section, Growth and Concentration

Among the 28 non-life insurers with a 2024 ROA, the highest were United (9.8%), Sena (9.3%), Crystal (9.1%), Islami (7.7%) and City (7.5%). The lowest were Sonar Bangla (0.7%), Desh General (1.7%), Phoenix (2.8%), Express (2.8%) and Rupali (2.9%). Crystal and Islami have below average cession (19% and 29%) and have ROA of above 7%, while Eastland has cession of 60% and ROA of 3.4%. There is no useful reinsurance information available for United and Sena to comment on, therefore they can't provide any information for H1.

Growth was modest. Sixteen non-life insurers have clean gross-premium observations for both 2021 and 2024. Their total gross premium grew from BDT 10.7 billion to BDT 11.8 billion with a compound annual growth rate of 3.2% and on average the median company grew by 5.9% annually. The dispersion had a wide range between −9.6% (Islami) to +9.4% (Republic and Crystal) and four companies reduced their size (Islami, Meghna, Sonar Bangla and Eastland). The 26 insurers that have full asset series saw total asset rose from BDT 41.7 billion to BDT 49.8 billion (6.1% a year), higher

than premiums, indicating that the balance sheets are expanding more through retained profits and investments than through underwriting expansion.

Market structure is very different between the two segments (Table VIII).

TABLE VIII. GROSS-PREMIUM CONCENTRATION AMONG RETAINED INSURERS WITH PREMIUM DATA IN BOTH 2021 AND 2024

Segment (retained firms)	Firms	HHI 2021	HHI 2024	Top-3 share 2021	Top-3 share 2024	Largest firm, 2024
Non-life	27	408	431	17.1%	20.6%	9.4%
Life	9	2,259	2,511	69.4%	76.5%	42.1% (National Life)

Note: HHI = Herfindahl–Hirschman index. The largest non-life share in 2024 is Northern, whose 2024 premium fails the premium check, so non-life figures are indicative only.

As per the industry wide antitrust's standards the non-life segment is unconcentrated with HHI in the range of 400-430 with no firm exceeding approximately 9% premium volume. The life concentration and strengthening trend continues: National Life increased from 39 to 42 percent of the market; premiums are written by the top three companies account for approximately 75 percent of total premium. The indices are based on retained firms only, and the share of each firm is calculated relative to a smaller subset of firms, which can lead to higher concentrations. These are indicative and not definitive.

F. Life Insurers

This is not the case for life insurers, however: cession is small (usually a few percent of gross premium or less); paid claims are benefits that are determined by the time of maturity of the policies; and distribution costs are high. The median ROA for their group is 0.9% (30 company-years) compared with 4.8% for the non-life insurers (Mann–Whitney $p < .001$). Table IX summarizes the nine insurers that were able to provide data.

TABLE IX. LIFE INSURERS

Company	Gross premium 2024 (BDT m)	Premium CAGR 2021–24	Avg. benefits ÷ net premium	Avg. ROA
National Life	21,062	14.0%	61%	8.3%
Delta Life	9,197	10.0%	102%	0.2%
Sonali Life	7,996	35.7%	20%	n/a
Prime Islami Life	3,809	−3.9%	72%	−1.7%
Meghna Life	3,361	−4.7%	108%*	−5.2%*
Sandhani Life	3,062	1.4%	101%†	−1.4%
Chartered Life	874	19.2%	38%	11.4%*
Trust Islami Life	517	19.8%	19%*	7.1%*
Padma Islami Life	145	−26.4%	108%	1.8%

*Note: * Average over two or three years only. † Reported claims equal net premium in every year, which looks like a compilation artefact. Popular Life is excluded because of its uniform-growth pattern.*

Median paid-benefit ratio has increased from 67% in 2021 to 74% in 2024, whereas the median ROA has remained at around 1% through these two years. All the other life companies including Prime Islami Life, Meghna Life (when data is available), Sandhani Life in 2021–22 and Delta Life in 2024 posted losses in each of the respective years. A few firms were doing premium growth (National, Delta, Sonali), while the growth was negative in the other firms (Meghna, Prime Islami and Padma). The size and product and asset mix is important to Asian life insurers, but product-mix data was not compiled and cannot be tested here, as shown by Chen and Wong [1]. Company-level life results should be interpreted with due caution as the claims are reported as 'outstanding' and Padma's claims liability is very close to the assets of the company.

G. Discussion

Profitability squeeze. Median non-life ROA decreased two percentage points and the underwriting margin by about nine; meanwhile, the investment yields remained unchanged. The increase in paid claims and an increased commission load doesn't reflect a poorer investment return, it reflects a poorer underwriting. Even the paid-basis combined ratio remained below 100% all the way, but it is a cash-based measure, and not a measure of underwriting profits.

Reinsurance. The negative relationship between cession and ROA is not sensitive to small sample sizes but only between firms. This pattern is observed in 3 readings and the data is not able to distinguish between them. Mayers and Smith [6] pointed out that the ownership, size and business concentration of a firm affects the demand for reinsurance, and that a firm's cession ratio is one of the traits that travel with the other persistent ones. Second, weaker (or thinner) capitalised insurance companies are more likely to cede more, consistent with the results of Lee and Lee [5] that higher-ROA insurance companies purchase less reinsurance and the results of Shiu [8], which suggest that the two decisions to cede and choose the insurance company's balance sheet are linked together. Third, high-cession firms are also high-cost firms: the link between the two is 0.55. A cession level of approximately 40% was reported for the Bangladesh market, which is close to the 42% reported by Lee and Lee [5] for the Taiwan market, indicating that both markets are highly dependent on reinsurance. The findings are in contrast to Lalon [4], who identifies no significant relationship between reinsurance dependence and profitability, which may be attributed to the sample (7 insurers compared to 2011–2020) or to the definition of profitability (revenue less operating expenses) and its estimation (from 3-year averages). The evidence is suggestive, however, because of the sensitivity of the result to the six firms excluded, and not decisive.

Investment income and size. Investment yield is positively associated with ROA in ranks, but it is not supported in the regressions which shows no investment effect reported by

Barua et al. [3]. The results here do not support the existence of a size effect, which is consistent with Adams and Buckle [2] but not with Chen and Wong [1] who reported the importance of size for Asian general insurers. The retained sample covers only a limited range of assets (BDT 0.9-3.0 billion) and scale effects could be present outside this range.

Market structure. Non-life premium is distributed among several medium-sized companies and life premium is in the hands of a few. That's a fragmented non-life segment and that's a good sign of thin margins and weak premium growth—well, if it really is a good sign.It's a fragmented non-life segment and that is a good indicator of thin margins and weak premium growth, unless that is a good indicator of thin margins and weak premium growth.

Implications. Results tell managers to consider a reassessment of the retention strategy, cost and expenses of reinsurance, and the premium growth target. A high cession ratio may more appropriately be a catalyst for regulators to look at capital and underwriting quality, rather than a problem in itself; no obvious relationship was found between cession changes within a firm and profit. A sensitivity analysis is provided to indicate how much a headline coefficient may rely on a few series, suggesting that screening rules and sensitivity checks should be provided with results for researchers.

H. Limitations

These data were manually extracted from reports using various units and formats. There were some entries that contradicted the other entries, which were removed by consistency checks, but errors that would meet the checks could remain, and the uniform-growth screen is heuristic.

The study begins with the complete listed population of non-life and life insurers, but nine of 15 life insurers and 33 of 43 non-life insurers are kept for analysis. Results apply to mid-sized insurers, as the excluded firms may be different and may be systematically different. Regressions utilize 77–85 company-years in 23–24 companies, thereby leaving an incomplete picture of the data even if bootstrap inference is considered, and the fixed-effects models have little power.

The claims and combined ratios are a proxy because the reserves move when claims are paid. All coefficients are associations, not causal effects, as all coefficients are determined together, cession, costs and profit. Year-end is a relevant time frame since ROA is based on the ratio at the end of the period, there is no capital adequacy variable, and there is no variable for ownership, and the window of 2021 to 2024 is a short one.

V. CONCLUSION

Underwriting margins declined and premium growth was sluggish, resulting in lower return on assets for listed non-life insurers in Bangladesh in 2024 compared to 2021. Under a bootstrap inference, insurers with higher ceding percentages had lower returns, and this is not due to a change in any particular firm but by a persistent separation between firms, with returns decreasing when six series are reinstated. Life insurance is much more focused than non-life and has far more uneven growth, higher benefit ratios and a significant number of loss makers. Other areas of future research may include extending the panel to 2024, including capital-adequacy and ownership information, and examining within-firm effects with longer series of incurred claims.

REFERENCES

[1] R. Chen and K. A. Wong, "The determinants of financial health of Asian insurance companies," *Journal of Risk and Insurance*, vol. 71, no. 3, pp. 469–499, 2004, doi: 10.1111/j.0022-4367.2004.00099.x.

[2] M. Adams and M. Buckle, "The determinants of corporate financial performance in the Bermuda insurance market," *Applied Financial Economics*, vol. 13, no. 2, pp. 133–143, 2003, doi: 10.1080/09603100210105030.

[3] B. Barua, S. Barua, and R. H. Rana, "Determining the financial performance of non-life insurers: Static and dynamic panel evidence from an emerging economy," *Journal of Developing Areas*, vol. 52, no. 3, pp. 153–167, 2018.

[4] R. M. Lalon, "Empirical study on macroeconomic and firm specific variables' effect on profitability of non-life insurance industry in Bangladesh," *Dhaka University Journal of Business Studies*, vol. 42, no. 2, pp. 75–96, 2023, doi: 10.3329/dujbst.v42i2.59716.

[5] H.-H. Lee and C.-Y. Lee, "An analysis of reinsurance and firm performance: Evidence from the Taiwan property-liability insurance industry," *The Geneva Papers on Risk and Insurance—Issues and Practice*, vol. 37, no. 3, pp. 467–484, 2012, doi: 10.1057/gpp.2012.9.

[6] D. Mayers and C. W. Smith, Jr., "On the corporate demand for insurance: Evidence from the reinsurance market," *Journal of Business*, vol. 63, no. 1, pp. 19–40, 1990, doi: 10.1086/296481.

[7] C. R. Cole and K. A. McCullough, "A reexamination of the corporate demand for reinsurance," *Journal of Risk and Insurance*, vol. 73, no. 1, pp. 169–192, 2006.

[8] Y.-M. Shiu, "Reinsurance and capital structure: Evidence from the United Kingdom non-life insurance industry," *Journal of Risk and Insurance*, vol. 78, no. 2, pp. 475–494, 2011.

[9] A. C. Cameron and D. L. Miller, "A practitioner's guide to cluster-robust inference," *Journal of Human Resources*, vol. 50, no. 2, pp. 317–372, 2015, doi: 10.3368/jhr.50.2.317.

[10] A. C. Cameron, J. B. Gelbach, and D. L. Miller, "Bootstrap-based improvements for inference with clustered errors," *Review of Economics and Statistics*, vol. 90, no. 3, pp. 414–427, 2008, doi: 10.1162/rest.90.3.414.