

Impact of Financial Ratios on Financial Performance of Sri Lankan Listed Life Insurance Companies: Comparative Analysis of Stable and Unstable Economy

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Abstract

The primary objective of this research is to examine the impact of financial ratios on the financial performance of Sri Lankan listed life insurance companies during periods of economic stability and instability. The study focuses on six life insurance companies listed on the Colombo Stock Exchange, utilizing quarterly secondary data from 2016 to 2023. The years 2016 to 2018 are considered as a stable economic period, while 2019 to 2023 represent an unstable economy. The analysis employs descriptive statistics, diagnostic tests, and regression analysis to assess the relationships between financial ratios and financial performance, measured by return on assets (ROA). The findings from the fixed effect models reveal that ROA differs significantly between stable and unstable economic conditions. The results indicate that the reinsurance ratio, investment ratio, and solvency margin have a statistically significant influence on ROA, though the magnitude of impact varies across the two economic periods. In contrast, the debt ratio does not show a statistically significant relationship with ROA in either economic condition. This study contributes to the literature by offering insights into how financial ratio dynamics differ under varying macroeconomic environments. It also provides practical implications for insurance firms in managing their financial strategies based on prevailing economic conditions. The findings can assist regulators, policymakers, and industry stakeholders in better understanding risk management and performance evaluation frameworks for the life insurance sector in emerging markets like Sri Lanka.

Keywords: *Financial Performance, Life Insurance, Return on Assets, Stable Economy, Unstable Economy*

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Introduction

Insurance is widely regarded as a crucial risk relief strategy, both in developed and developing countries. Its importance continues to rise as it provides financial security and peace of mind to policyholders, particularly in times of uncertainty and crisis (Bianchi & Sampson, 2018). The life insurance industry plays a pivotal role in ensuring individuals and their families are protected financially, offering stability during volatile periods (Ahmed et al., 2011). In an ever-changing world, insurance is essential for businesses to manage various risks. Moreover, the strong insurance sector contributes significantly to the country's overall risk bearing ability and infrastructure development (Charumathi, 2012). In Sri Lanka, the life insurance sector has shown consistent growth due to efforts to enhance operational processes, improve service quality, and introduce innovative products that meet the evolving needs of customers. Increasing customer awareness and aligning products with socio-economic conditions have further driven the demand for life insurance (Insurance Regulatory Commission of Sri Lanka, 2018). Sri Lanka, however, has faced multiple challenges, including a civil war, natural disasters such as the 2004 Tsunami, and a global fiscal crisis (Sally, 2006). However, recent years have brought further challenges, such as the Easter Sunday bombings in 2019, the onset of the COVID-19 pandemic, and the 2022 economic crisis, which severely impacted the nation's economy. This crisis, often considered the worst since Sri Lanka's independence in 1948, was marked by skyrocketing inflation, declining GDP, depreciation of the rupee, and shortages of essential supplies. Several interconnected factors, including populist tax policies, excessive money printing, and global disruptions like the pandemic, compounded the crisis (Ishtiaq & Siddiqui, 2019).

As Fahmi (2014) suggests, "Financial performance is an analysis conducted to see the extent to which a company has implemented financial strategies properly and effectively." For financial institutions like insurance companies, profitability, liquidity, and solvency are the key metrics for evaluating performance (Napagoda, 2021). However, profitability remains a major challenge, and it plays a decisive role in determining the financial success of insurance firms (Malik, 2011). Financial ratio analysis is an essential tool in this regard, offering insights into financial conditions, risks, and opportunities (Tyas, 2020). This study focuses on several key financial ratios' reinsurance ratio, debt ratio, investment ratio, and solvency margin as independent variables, while return on assets serves as the dependent variable to assess financial performance. Insurance offers stability and growth, making understanding the financial performance of life insurance firms crucial. Ibrahim (2023) study on the UAE's insurance companies highlights the need for comprehensive analysis of financial performance during economic crises, emphasizing the importance of insurance in ensuring individuals and organizations meet their objectives. This research focuses on evaluating the impact of financial ratios on the financial performance of listed life insurance companies in Sri Lanka, comparing their performance during stable and unstable economic periods. The primary goal of life insurance companies is to maximize profits, and various international studies have analyzed the factors influencing the financial performance of insurance firms, often relying on quarterly data (Pulawska, 2021).

This study uses financial and risk management theories to analyze the relationship between financial ratios and firm performance. The Resource-Based View (RBV) focuses on how businesses use financial resources to gain a competitive advantage, while the Trade-off Theory emphasizes the balance between debt and equity financing in the insurance industry. The Contingency Theory considers external factors influencing a firm's performance, aligning with the study's comparison of performance in stable and unstable economies. This provides

a robust analytical framework for assessing the impact of financial ratios on Sri Lankan life insurance businesses.

Research Problem

However, there is a significant gap in research addressing the financial performance of Sri Lankan life insurance companies, particularly in times of economic instability (Pathirana & Buddhika, 2021). Previous studies have combined life and general insurance companies, producing mixed results that do not provide clear insights into the life insurance sector alone (Sibindi, 2021). Therefore, this research aims to fill the gap by focusing exclusively on the life insurance industry in Sri Lanka and evaluating financial performance during different economic conditions. While evaluating the financial performance of insurance companies during global economic crises has been a critical area of research (Mukdad Ibrahim, 2023), there is a lack of studies specifically addressing the Sri Lankan context, especially during economic instability. Additionally, comparative studies on the performance of life insurance firms during stable and unstable economic conditions are scarce. This research seeks to address these gaps by investigating the impact of financial ratios on the financial performance of Sri Lankan listed life insurance companies under stable and unstable economies. The findings will provide valuable insights to help insurance companies identify key variables affecting their financial performance and mitigate losses during periods of economic instability.

To address the research issue, the following questions are posed: “What is the impact of financial ratios on the financial performance of Sri Lankan listed life insurance companies in a stable economy?”, “What is the impact of financial ratios on the financial performance of Sri Lankan listed life insurance companies in an unstable economy?” and “How do the financial performances of Sri Lankan listed life insurance companies differ between stable and unstable economies?”. Based on these three questions, the research has three primary objectives:

- To examine the impact of financial ratios on the financial performance of Sri Lankan listed life insurance companies in a stable economy.
- To examine the impact of financial ratios on the financial performance of Sri Lankan listed life insurance companies in an unstable economy.
- To compare the financial performance of Sri Lankan listed life insurance companies between stable and unstable economic conditions.

This study aims to strengthen the insurance industry, increase economic activity, and aid newcomers in capturing market share. It will help shareholders and investors assess insurers' soundness and solvency. By addressing existing research gaps, it will contribute to the academic knowledge on Sri Lankan listed life insurance companies' financial performance during economic fluctuations. The findings will also provide insights into government authorities to improve the insurance sector's financial stability.

While this study focuses on a selected number of financial variables, other factors may also affect the financial performance of life insurance companies. Despite the presence of non-life insurance companies, this research is limited to the life insurance sector in Sri Lanka. The data covers an eight-year period and is divided into two economic conditions. The study uses secondary data, and primary data collection, such as questionnaires, is not employed due to concerns about the reliability of responses, as respondents may provide biased or incomplete information.

Literature Review

In Sri Lanka, the sector comprised 28 insurance companies in 2023. Life insurance, in particular, serves as a vital tool for risk transfer and social security, supporting long-term obligations and financial market stability (Mulchandani, 2017). The life insurance sector in Sri Lanka includes 14 companies prioritizing policyholder welfare and beneficiary protection (Sibindi, 2021). Return on Assets (ROA) measures profitability relative to total assets (Sibindi, 2021). Ibrahim, 2023 demonstrates that ROA is a key dependent variable in insurance performance analysis.

Reinsurance serves as a key tool for spreading risk, stabilizing insurer earnings, and enhancing financial performance, particularly ROA and asset utilization (Adams, 1996). It strengthens insurers' resilience to economic shocks and mitigates bankruptcy risk by transferring catastrophic losses to reinsurers. Ibrahim (2023) found that reinsurance's role increases during economic instability, allowing insurers to absorb shocks, though excessive reliance may reduce profitability, suggesting a context-dependent effect. While Sibindi (2021) highlights its benefits such as improved solvency and underwriting capacity, reinsurance also involves significant costs. Empirical studies show mixed results: Morara and Sibindi (2021) and Chen and Wong (2004) report a positive impact on financial performance, whereas Mohamed (2019) suggest a negative or insignificant effect.

Some studies suggest a positive relationship between debt and performance. Mwangi and Murigu (2015) found profitability positively correlated with higher debt, and Lee (2014) highlighted that prudent debt management reduces capital costs and enhances financial stability, positively impacting ROA. Sibindi (2021) reported a negative relationship between debt ratio and ROA in Kenyan insurers. Similarly, Ahmed et al. (2011) also identified a negative impact of high debt ratios on ROA. As Sibindi (2021) noted, firms must carefully manage leverage to avoid over-indebtedness that can impair their ability to meet financial obligations and diminish performance.

Chen and Wong (2004) emphasize that investment performance is vital to an insurer's financial stability. Empirical findings by Sibindi (2021) using pooled OLS estimation confirm that an increase in the investment ratio leads to higher ROA. Effective asset-liability management is also critical, especially in life insurance, where long-term obligations require investment strategies that safeguard policyholder welfare and buffer against short-term economic shocks.

Solvency Margin shows in what way solvent an enterprise is, or how prepared it is to meet unexpected needs. It is the key indicator of the insurer's financial performance. Associated research studies by Odira (2018) and (Burca, 2014) found that the solvency margin is a key indicator in the financial performance of the insurance industry. A positive relationship between this variable and the insurer's financial performance is expected since the insurer's financial performance is a significant benchmark for potential policyholders (Burca, 2014). According to Pathirana and Buddhika (2021), Solvency becomes particularly crucial during economic instability, since liquidity pressures and inflationary conditions challenge insurers' ability to meet obligations.

Economic stability is a state where an economy experiences steady growth, low inflation, and minimal fluctuations in output and employment. According to Cossiga, 2017, stability in an economic system can be characterized by the maximization of the economy's potential, weak tensions within the price system, and a growth trajectory. This is the natural state of economic systems, unlike instability, which weakens development potential and causes price tensions.

Since the end of the civil war in 2009, the economy has expanded at an average annual rate of 5.8%, resulting in improved living conditions and a shift from near destitution to stability and balanced regional development (World Bank Report, 2018). However, economic expansion has significantly raised living conditions, especially as the nation has moved from near destitution to stability and prioritized balanced regional development (Athukorala, 2016).

Sri Lanka's insurance industry has faced significant challenges due to adverse macroeconomic conditions (Insurance Regulatory Commission of Sri Lanka, 2022). From 2016 to 2019, the long-term insurance sector experienced a declining gross written premium (GWP) growth rate. However, from 2016 to 2020, GWP increased by 62.22%, driven by heightened public awareness of life insurance during the COVID-19 pandemic. In 2021, the industry saw strong GWP growth as demand for protection rose. Yet, in 2022, economic pressures such as higher living costs and reduced disposable income led to a decline in insurance spending, causing GWP growth to drop to 9.35%. Ibrahim (2023) highlights how changes in inflation, exchange rates, and disposable income affect consumer demand and the efficacy of financial ratios, which in turn affects insurers' capacity to maintain profitability. This reinforces the necessity to investigate the differences in the behavior of ratios such as reinsurance, debt, investment, and solvency in stable and unstable economic environments.

Methodology

Research approaches should be determined considering the scope and limitations to conduct and achieve the research objective. Every researcher considers mainly two types of research approaches the quantitative approach and the qualitative approach. The researchers followed a quantitative approach for this research study. This method entails gathering and analyzing numerical data in order to identify trends, relationships, and patterns within the study (Sibindi, 2021).

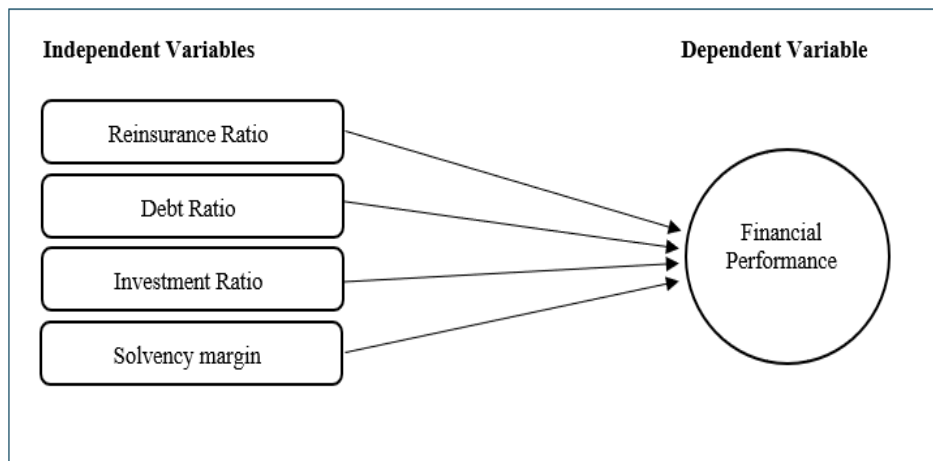


Figure I: Conceptual Framework

This study intends to investigate the impact of financial ratios on financial performance of the Sri Lankan life insurance companies in a stable and unstable economy. Here the authors consider eight years of period from 2016 to 2023 and uses quarterly data 2016 to 2018 as stable and 2019 to 2023 as unstable to derive with correct conclusions. Researchers could find

quarterly data only from the companies registered in Colombo Stock Exchange (CSE). There are only seven listed life insurance companies in Sri Lanka. From that seven listed insurance companies' authors have to drop one insurance company due to the unavailability of data for the period that researchers consider. Sanasa Life Insurance Company PLC has been registered in CSE in 2021. Therefore, researchers have selected the entire population as the sample by excluding Sanasa Life Insurance Company PLC. These companies represent an average of 40% of the Sri Lankan Life insurance industry. As well there are two companies from the top five market leaders of the Life insurance industry in Sri Lanka. They are Softlogic Life PLC and Union Assurance PLC. The rest of the companies are HNB Assurance PLC, Janashakthi Insurance PLC, Arpico Insurance PLC, Amana Takaful Life PLC.

To conduct this study, the authors use secondary data which are collected from the quarterly reports of the CSE registered life insurance companies, IRCSL annual reports and statistical reviews reports. From the first quarter of 2016 to the fourth quarter of 2023, the researchers have collected data for the study. The authors use quantitative data analysis based on mathematical and statistical models. For that, the tests are performed using STATA software to analyze secondary data and derive the conclusion and recommendation. This study evaluates the impact of financial ratios on financial performance of Sri Lankan listed life insurance companies: comparison to stable and unstable economic conditions. So that, the authors have developed two models for stable economic condition and unstable economic condition. Model 1 and model 2 of this study are given below.

Model 01: Stable Economy

$$ROA1 = \beta_0 + \beta_1 REIS_i + \beta_3 DEBT_i + \beta_5 INV_i + \beta_7 SOM_i + \epsilon_i$$

Model 02: Unstable Economy

$$ROA2 = \beta_0 + \beta_{12} REIS_i + \beta_{4} DEBT_i + \beta_{6} INV_i + \beta_{8} SOM_i + \epsilon_i$$

ROA= Return on Assets, REIS= Reinsurance Ratio, DEBT= Debt Ratio, INV= Investment Ratio, SOM= Solvency Margin, ϵ_i - Error Term

Based on conceptual design, the following hypotheses have been developed to test the study.

H₁: There is a statistically significant impact of reinsurance ratio on ROA of Sri Lankan life insurance companies in a stable economy.

H₂: There is a statistically significant impact of reinsurance ratio on ROA of Sri Lankan life insurance companies in an unstable economy.

H₃: There is a statistically significant impact of debt ratio on ROA of Sri Lankan life insurance companies in a stable economy.

H₄: There is a statistically significant impact of debt ratio on ROA of Sri Lankan life insurance companies in an unstable economy.

H₅: There is a statistically significant impact of investment ratio on ROA of Sri Lankan life insurance companies in a stable economy.

H₆: There is a statistically significant impact of investment ratio on ROA of Sri Lankan life insurance companies in an unstable economy.

H₇: There is a statistically significant impact of solvency margin on ROA of Sri Lankan life insurance companies in a stable economy.

H₈: There is a statistically significant impact of solvency margin on ROA of Sri Lankan life insurance companies in an unstable economy.

Furthermore, the study also tests the broader hypothesis that,

H₉: There is a statistically significant difference in the ROA of Sri Lankan listed life insurance companies between stable and unstable economic periods.

To estimate the models, both the Fixed effects and Random Effects panel regressions are employed using F-test and Breusch and Pagan Lagrangian multiplier test. Since the test did not get both fixed effects and random effects, the researcher ignored the Hausman test since it is a test to take a decision between Fixed effects or Random effects. Accordingly, Fixed effect model is employed in this research to elaborate the findings and derive conclusions. After choosing the model certain diagnostic tests were carried out in the study to test the suitability and fitness of the data set. These tests were employed to test for multicollinearity, heteroskedasticity, serial correlation (autocorrelation) and cross-sectional dependence.

Results and Discussion

Descriptive Statistics

Table I: Descriptive statistics						
Variable		Mean	Std. Dev.	Min	Max	Observations
ROA (Stable)	overall	.0562	.1123	-.0004	.4907	N = 72
	between		.0619	.0073	.1688	n = 6
	within		.0968	-.1130	.3780	T = 12
ROA (Unstable)	overall	.0196	.0209	-.0065	.1051	N = 120
	between		.0129	.0077	.0439	n = 6
	within		.0172	-.0138	.0807	T = 20
REIS (Stable)	overall	.0478	.0245	.0024	.1123	N = 72
	between		.0239	.0290	.0927	n = 6
	within		.0108	.0175	.0773	T = 12
REIS (Unstable)	overall	.0557	.0242	.0006	.0006	N = 120
	between		.0225	.0417	.0417	n = 6
	within		.0127	.0092	.0092	T = 20
DEBT (Stable)	overall	.7187	.1161	.4790	.9121	N = 72
	between		.1129	.5608	.8405	n = 6
	within		.0520	.5717	.8329	T = 12
DEBT (Unstable)	overall	.7092	.1079	.5318	.8601	N = 120
	between		.1104	.5682	.8485	n = 6
	within		.0372	.6010	.8373	T = 20
INV (Stable)	overall	.2819	.1336	.0485	.5341	N = 72
	between		.1195	.1124	.4395	n = 6
	within		.0761	.0882	.5659	T = 12

INV (Unstable)	overall	.3564	.2063	.0809	1.2576	N = 120
	between		.1649	.1593	.5943	n = 6
	within		.1403	.1151	1.0197	T = 20
SOM (Stable)	overall	.0808	.1917	-.0009	.0014	N = 72
	between		.1077	.0090	.2931	n = 6
	within		.1641	-.2132	.7891	T = 12
SOM (Unstable)	overall	.0305	.0387	-.0144	.2089	N = 120
	between		.0217	.0130	.0730	n = 6
	within		.0331	-.0290	.1728	T = 20

Source: Authors compiled based on Survey Data

N= The total number of observations in the dataset, n= The number of unique cross-sectional units, T= The number of time periods for each cross-sectional unit.

The results produced in Table I from descriptive statistics are as follows. Descriptive statistics is used to quantify the central tendency, variability and dispersion. The mean value of ROA is 0.0562, while the maximum and minimum values respectively lie at 0.4907 and -.0004 in stable economy. Overall standard deviation 0.1123 represents the total variability in dataset. Between standard deviation is 0.0619 and within value is 0.0968. These values represent the differences across companies and fluctuations within a company over different periods. But in unstable economy the mean value of ROA is 0.0196 shows a drop in mean.

Overall maximum and minimum values lie at 0.1051 and -0.0065 respectively. Overall standard deviation is 0.0209 and between companies 0.0129 within a company over different periods is .0172. The standard deviation for ROA in stable conditions is 0.1123, much larger than 0.0209 in an unstable economy. The maximum values of ROA further support this, with the highest ROA in stable conditions reaching 49.07%, compared to just 10.51% in an unstable economy. REIS also depicts notable trends. It has a mean value of .0478 and a range of 0.1123 and 0.0024 at its maximum and minimum respectively in a stable economy. Overall standard deviation lies at 0.0245, between is 0.0239 and within is 0.0108. In an unstable economy, REIS has a slightly higher mean of 0.0557, with an overall standard deviation of 0.0242, a between standard deviation of 0.0225, and a within standard deviation of 0.0127. The minimum and maximum values remain consistent at 0.0006 and 0.1123, respectively. DEBT indicates 0.7187 with an overall standard deviation of 0.1161, a between standard deviation of 0.1129, and a within standard deviation of 0.0520. The minimum and maximum values are 0.4790 and 0.9121, respectively. In an unstable economy, DEBT has a mean of 0.7092, with an overall standard deviation of 0.1079, a between standard deviation of 0.1104, and a within standard deviation of 0.0372. The minimum and maximum values are slightly lower, at 0.5318 and 0.8601, respectively. as its mean value. For INV, the mean in a stable economy is 0.2819, with an overall standard deviation of 0.1336, a between standard deviation of 0.1195, and a within standard deviation of 0.0761. The minimum value observed is 0.0485, while the maximum is 0.5341. In an unstable economy, INV has a higher mean of 0.3564, with an overall standard deviation of 0.2063, a between standard deviation of 0.1649, and a within standard deviation of 0.1403. The minimum and maximum values are 0.0809 and 1.2576, respectively. Lastly, the SOM in a stable economy has a mean of 0.0808, with an overall standard deviation of 0.1917, a standard deviation of 0.1077, and a within standard deviation of 0.1641. The minimum and maximum values are -0.0009 and 0.2931, respectively. In an unstable economy, SOM has a mean of 0.0305, with an overall standard deviation of 0.0387, a between standard deviation of 0.0217, and a within standard deviation of 0.0331. The minimum value is -0.0144, and the maximum value is 0.2089.

Diagnostic Tests for Model 01*Multicollinearity***Table II: Correlation test - Model 01**

Corre REIS DEBT INV SOM (obs=72)				
	REIS	DEBT	INV	SOM
REIS	1.0000			
DEBT	0.3226	1.0000		
INV	-0.2781	0.0233	1.0000	
SOM	0.0363	-0.2790	0.3460	1.0000

Source: Authors compiled based on Survey Data

The result in Table II demonstrates the correlation between the independent variables. According to the correlation matrix if variables are related not more than 0.5 means 50% does not exist multicollinearity. All the variables are less than 0.5. RIES with DEBT 0.3226, INV - 0.2781, SOM 0.0363. DEBT with INV 0.0233, SOM -0.2790. INV with SOM 0.3460.

Heteroskedasticity

The study needs to test for the heteroskedasticity in the dataset to find whether the regression model error term is not constant across all observations. This study used the Modified Wald test for groupwise heteroskedasticity in fixed effect regression model as it is typically preferred in testing for heteroskedasticity.

Table III: Modified Wald test- Model 01

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model	
Chi2 (6)	6330.62
Prob > chi2	0.0000

Source: Authors compiled based on Survey Data

According to Table III, the Modified Wald test result, P value is 0.0000 and that indicates that the null hypothesis of this test which is the data is homoscedastic has been rejected. Thus, this data set is heteroskedastic. However, there are remedies that can be sorted out by using the panel corrected standard errors.

*Serial Correlation (Autocorrelation)***Table IV: Wooldridge test- Model 01**

Wooldridge test for autocorrelation in panel data	
H0: no first-order autocorrelation	
F (1 , 5)	107.515
Prob > F	0.0001

Source: Authors compiled based on Survey Data

Serial correlation suggests that the error terms are correlated, which complicates regression modeling. This study used Wooldridge test for autocorrelation in panel data to test for serial

correlation. According to Table IV, the test found that wooldrige statistic value as 0.0001. As per the result this value is less than 0.05 rejected the null hypothesis (H0) of no first order autocorrelation, concluding that the data set has serial correlation. This error can be sorted by using a panel correcting standard errors for this dataset. The findings are presented below.

Cross Sectional Dependence

This measures whether cross sectional units in a panel data model are independent of each other. This error occurs when the shocks in one unit affect others. In this study researchers have used Pesaran's test of cross-sectional independence.

Table V: Pesaran's test- Model 01

Pesaran's test of cross-sectional independence	-0.727	Pr= 0.4670
Average absolute value of the off-diagonal elements	0.392	

Source: Authors compiled based on Survey Data

As per the outcome in Table V, the test statistic is -0.727 and probability value is 0.4670 which is more than 0.05. That indicates the test failed to reject the null hypothesis of no cross-sectional dependence. This result confirms that there is no cross-sectional dependence on data, and the model does not require adjustments for such effects.

Regression Analysis

Table VI: Regression Output-Model 01

Fixed-effects (within) regression				Number of observations = 72
Group variable: Company1				Number of groups = 6
R-sq:	within	= 0.9436		Obs per group: min = 12
	between	= 0.7971		avg = 12
	overall	= 0.8854		max = 12
corr(u_i, Xb) = -0.3732				F(4,5) = 13062.23
				Prob > F = 0.0000
				(Std. Err. adjusted for 6 clusters in Company1)
ROA	Coef.	Robust Std. Err.	t	P> t
REIS	-.3188	.0988	-3.23	0.023
DEBT	-.1812	.0993	-1.82	0.128
INV	.0465	.0182	2.55	0.049
SOM	.5609	.0045	125.74	0.000
cons	.1432	.0702	2.04	0.097

Source: Authors compiled based on Survey Data

Model 01 adopted the clustered robust standard error to analyze panel data since the data set violated the assumptions of homoskedasticity and no first order autocorrelation. According to Table VI, the study found R square of 94.36%. This variation was explained by the factors which were undertaken by the study. Between value of 79.71% indicates the high explanatory power across companies. 88.54% overall value confirms the model's robustness. The fixed

effect model appears to be suitably described based on the low correlation between unobserved effects (Corr ui ,Xb= -0.3732) and independent variables. It can be inferred that the ROA model was good fit, based on the higher Explanatory Power. The F- Statistic 13062.23 with a P-value was 0.0000 indicating that the overall model is fit to describe the changes in ROA with respect to the selected variables and suggesting that the model is highly significant.

Table VII: Summary of the Regression Output-Model 01

Variable	Coefficient	P-value	Significance	Sign
REIS	-0.3188	0.023	Significant	Negative
DEBT	-0.1812	0.128	Insignificant	Negative
INV	0.0465	0.050	Significant	Positive
SOM	0.5609	0.000	Significant	Positive

Source: Authors compiled based on Survey Data

The coefficients in the fixed effects regression represent the estimated impact of each independent variable while holding other variable constant on dependent variable. According to table VII, the estimated coefficient for REIS is -0.3188, indicating that ROA decreases by 31.88% for every unit of increase in reinsurance ratio and every one unit of increase in debt ratio associated with decrease in ROA by 18.12%. This suggests that in stable economies, a greater dependence on reinsurance may result in lower profitability. Every one unit of increase in investment ratio is associated with a 4.64% increase in ROA, indicating that investments contribute to profitability during stable periods. A one unit increase in the solvency margin leads to a 0.5609 increase in ROA. As per the probability values of REIS (P= 0.023) and INV (P=0.050) indicate that these variables are significant to test ROA. DEBT (P= 0.128) indicates that this is insignificant to test ROA. However, P- value of SOM 0.000 which is less than 0.05 shows the solvency margin is the most impactful and statistically significant factor affecting ROA, suggesting that it plays a crucial role in maintaining financial stability.

Diagnostic Tests for Model 02

Multicollinearity

Table VIII: Correlation test-Model 02

Corre REIS DEBT INV SOM (obs=120)				
	REIS	DEBT	INV	SOM
REIS	1.0000			
DEBT	0.1438	1.0000		
INV	-0.3028	0.0406	1.0000	
SOM	0.3550	-0.2149	-0.1645	1.0000

Source: Authors compiled based on Survey Data

The result in Table VIII demonstrates the correlation between the independent variables. According to the correlation matrix if variables are related not more than 0.5 means 50% does not exist multicollinearity. All the variables are less than 0.5. REIS with DEBT 0.1438, INV - 0.3028, SOM 0.3550. DEBT with INV 0.0406, SOM -0.2149. INV with SOM -0.1645.

Heteroskedasticity

Model 2 needs to test for the heteroskedasticity in the dataset to find whether the regression model error term is not constant across all observations.

Table IX: Modified Wald test- Model 02

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model	
Chi2 (6)	130.36
Prob > chi2	0.0000

Source: Authors compiled based on Survey Data

According to Table IX, the Modified Wald test result, P value is 0.0000 and that indicates that the null hypothesis of this test which is the data is homoscedastic has been rejected. Thus, this data set is heteroskedastic.

Serial Correlation (Autocorrelation)

Table X: Wooldridge test -Model 02

Wooldridge test for autocorrelation in panel data	
H0: no first-order autocorrelation	
F (1 , 5)	1.951
Prob > F	0.2213

Source: Authors compiled based on Survey Data

The Table X depicts that Wooldridge statistic P-value is 0.2213. As per the result this value is more than 0.05 accepted the null hypothesis (H0) of no first order autocorrelation, concluding that the data set has no serial correlation.

Cross Sectional Dependence

TableXI: Pesaran's test-Model 02

Pesaran's test of cross-sectional independence	3.012	Pr= 0.0026
Average absolute value of the off-diagonal elements	0.254	

Source: Authors compiled based on Survey Data

As per Table XI, the test statistic is 3.012 and probability value is 0.0026 which is less than 0.05. That indicates the test rejected the null hypothesis of no cross-sectional dependence. This result indicates that there is cross-sectional dependence on data and the model required adjustments for such effects.

Regression Analysis

Table XII: Regression Output-Model 02

Linear regression, correlated panels corrected standard errors (PCSEs)				
Group variable: Company1		Number of obs	=	120
Time variable: Quarter		Number of groups	=	6
Panels: correlated (balance		Obs per group: min	=	20
Autocorrelation: no autocorrelation		avg	=	20
		Max	=	20
Estimated covariances = 21		R-squared	=	0.7534
Estimated autocorrelations = 0		Wald chi2(4)	=	292.10
Estimated coefficients = 5		Prob > chi2	=	0.0000

ROA	Coef.	Panel-corrected Std. Err.	z	P>z
REIS	.1725	.0532	3.24	0.001
DEBT	-.0031	.0094	-0.33	0.739
INV	.0174	.0047	3.71	0.000
SOM	.4289	.0341	12.57	0.000
cons	-.0071	.0060	-1.19	0.232

Source: Authors compiled based on Survey Data

As per the results in Table XII, Model 02 adopted the panel corrected standard errors to analyze panel data since the data set violated the assumptions of homoskedasticity and no cross-sectional dependence. The study found R square of 75.34%. This indicates the predictors are sufficient for explaining profitability variation. It can be inferred that ROA model was good fit, based on the higher explanatory power. The Wald chi2(4) = 292.10 with p-value = 0.0000 indicating that the overall model is statistically significant.

Table XIII: Summary of the Regression Output-Model 02

Variable	Coefficient	P-value	Significance	Sign
REIS	0.1725	0.001	Significant	Positive
DEBT	-0.0031	0.739	Insignificant	Negative
INV	0.0174	0.000	Significant	Positive
SOM	0.4289	0.000	Significant	Positive

Source: Authors compiled based on Survey Data

The coefficients in the panel corrected standard errors explain independent variable while holding other variables constant on dependent variable. According to table XIII, the estimated coefficient for REIS is 0.1725, indicating that ROA increases by 17.25% for every unit of increase in reinsurance ratio and every one unit of increase in debt ratio associated with decrease in ROA by 0.31%. This suggests that in unstable economies, a greater dependence on reinsurance may result in higher profitability. Every one unit of increase in investment ratio is associated with a 1.74% increase in ROA indicating that investments contribute to profitability during unstable periods. A one unit increase in the solvency margin leads to a 0.4289 increase in ROA. As per the probability values of REIS (P= 0.001) indicate that this variable is significant to test ROA. DEBT (P= 0.739) indicates that this is insignificant to test

ROA. However, P- value of SOM and INV 0.000 which is less than 0.05 shows the solvency margin and investment ratio are the most impactful and statistically significant factor affecting ROA in an unstable economic condition.

Comparative Analysis among Stable and Unstable Economies

The results of model 01 and model 02 emphasis the impact of financial ratios on financial performance under stable and unstable economic conditions, focusing on variables such as reinsurance ratio, debt ratio, investment ratio and solvency margin an also the overall model's performance.

Model 01 adopted the clustered robust standard error to analyze panel data in fixed effects since the dataset violated the assumptions of homoskedasticity, and no first order autocorrelation and Model 02 adopted panel corrected standard errors to analyze panel data since the data set violated the assumptions of homoskedasticity and no cross-sectional dependence. The R square explains the proportion of variance in ROA that can be explained by the independent variables. Model 01 within, between and overall R squares are 94.36%, 79.71%, 88.54% respectively which shows a higher R square than Model 02. Model 02 R square is 75.34%. But both models exhibit strong fit as predictors are statistically significant (P-value=0.000).

Testing Hypotheses

Table XIV: Summary of Comparative Analysis

Variable		Coefficient	P- Value	Result
REIS	Stable	-0.3188	p = 0.023	Supported
	Unstable	0.1725	p = 0.001	Supported
DEBT	Stable	-0.1812	p = 0.128	Not supported
	Unstable	-0.0031	p = 0.739	Not supported
INV	Stable	0.0464	p = 0.049	Supported
	Unstable	0.0174	p = 0.000	Supported
SOM	Stable	0.5609	p = 0.000	Supported
	Unstable	0.4289	p = 0.000	Supported

Source: Authors compiled based on Survey Data

H₁: There is a statistically significant impact of reinsurance ratio on ROA of Sri Lankan life insurance companies in a stable economy.

According to the coefficient, ROA decreases by 31.88% for every unit rise in the reinsurance ratio. According to the P-value (P=0.023), this effect is statistically significant. Thus, there is

a negative relationship between reinsurance ratio and ROA. Therefore, the null hypothesis of there is no significant impact of reinsurance ratio on ROA in a stable economy is rejected. The analysis supports a significant relationship between reinsurance ratio and ROA under the current model. This result is in line with the finding of Mohamed, 2019. Wasike, 2016 also has elaborated that reinsurance ratio has a negative impact on ROA but it is statistically insignificant.

H₂: There is a statistically significant impact of reinsurance ratio on ROA of Sri Lankan life insurance companies in an unstable economy.

The positive coefficient (0.1725) suggested that the increase in reinsurance ratio impacts to increase ROA by 17.25%. However, the P-value of 0.001 indicates that the relationship between reinsurance ratio and ROA is statistically significant. Accordingly, this reinsurance ratio has a significant positive effect on ROA. Therefore, the null hypothesis of there is no statistically significant impact of reinsurance ratio on ROA in an unstable economy is rejected. This indicates that this result is in line with Morara and Sibinidi (2021) and Chen, R., & Wong, K. A. (2004) findings.

H₃: There is a statistically significant impact of debt ratio on ROA of Sri Lankan life insurance companies in a stable economy.

According to the coefficient, ROA decreases by 18.12% for every unit rise in the debt ratio. But according to the P-value= 0.128, this effect is not statistically significant. Thus, there is a negative relationship between debt ratio and ROA. Therefore, the null hypothesis of there is no significant impact of debt ratio on ROA in a stable economy is accepted. The analysis does not support a significant relationship between debt ratio and ROA under the current model, despite theoretical assumptions. This effect can be come to account due to the firm's operational efficiency and cost of debt. According to Sibindi (2021) the impact of debt ratio on ROA was negative and statistically insignificant.

H₄: There is a statistically significant impact of debt ratio on ROA of Sri Lankan life insurance companies in an unstable economy

The negative coefficient (0.0031) suggested that the increase in debt ratio impacts to decrease ROA by 0.31%. However, the high P-value of 0.739 indicates that the relationship between investment ratio and ROA is statistically insignificant. However, this debt ratio has a negative impact on ROA. But the effect is negligible. Adams & Buckle, 2003 and Ahmed et al. 2011 have elaborated that higher debt ratios correlated negatively with ROA.

H₅: There is a statistically significant impact of investment ratio on ROA of Sri Lankan life insurance companies in a stable economy

The study revealed that investment ratio has a significant positive impact on ROA. The coefficient is 0.0464 and P-value is 0.049 which is closer to 0.05. Further, the study could reject the null hypothesis which is there is no statistically significant impact of investment ratio on ROA of Sri Lankan life insurance companies in a stable economy. According to Sibindi (2021), this finding is in line.

H₆: There is a statistically significant impact of investment ratio on ROA of Sri Lankan life insurance companies in an unstable economy

The positive coefficient of 0.0174 indicates that one unit of investment ratio increase leads to a 1.7% increase in ROA. The P-value 0.000 shows that this effect is highly statistically

significant. There is a statistically significant positive effect of investment ratio on ROA in an unstable economy is accepted revealing that investment activities are a critical determinant of profitability for Sri Lankan life insurance companies during economic instability. As per Cheng and Wong (2004) performance of investment is crucial to the financial health of an insurer.

H₇: There is a statistically significant impact of solvency margin on ROA of Sri Lankan life insurance companies in a stable economy

The finding strongly supports H₇, confirming that the solvency margin significantly impacts ROA in Sri Lankan life insurance companies during a stable economy. One unit increase in the solvency margin leads to a 0.5609 increase in ROA. P-value 0.000 demonstrates that this effect is highly statistically significant. Therefore, null hypothesis of there is no impact of solvency margin on ROA in a stable economy is rejected and the alternative is accepted. Sibindi (2021) has found that the effect of solvency margin on ROA is positive and statistically significant.

H₈: There is a statistically significant impact of solvency margin on ROA of Sri Lankan life insurance companies in an unstable economy

The coefficient (0.4289) shows a positive impact of solvency margin on ROA. The P-value 0.000 highlights a highly significant impact, showing that solvency margin plays a crucial role in determining ROA. The null hypothesis is there is a no statistically significant impact of solvency margin on ROA of Sri Lankan life insurance companies in an unstable economy. Since the p value is less than 0.05, null hypothesis is rejected, and the alternative is accepted. Odira (2018) and Burca (2014) found a valid positive impact of solvency margin on ROA.

H₉: There is a statistically significant difference in the ROA of Sri Lankan listed life insurance companies between stable and unstable economic periods

Table XIV compares firm-specific determinants of ROA between stable and unstable economic time frames. The results show that the impact of explanatory factors significantly diverges between the two periods. For instance, the reinsurance ratio has a negative impact on ROA during stable economies ($\beta = -0.3188$, $p = 0.023$), while it has a positive impact during unstable economies ($\beta = 0.1725$, $p = 0.001$). The investment ratio behaves differently in both periods ($\beta = 0.0464$, $p = 0.049$ in stable; $\beta = 0.0174$, $p = 0.000$ in unstable), and the solvency margin is highly significant in both periods, but again the coefficients differ considerably ($\beta = 0.5609$ in stable; $\beta = 0.4289$ in unstable), indicating different degrees of financial strength. In contrast, neither period's debt ratio has statistical significance, suggesting that its ability to explain performance is limited. However, the conclusion that firm-specific factors influencing ROA behave differently across economic regimes is supported by the total comparative evidence. Since it is evident that there is a statistically significant difference between stable and unstable economic periods in the ROA of Sri Lankan listed life insurance businesses, H₉ is supported. Kumararathna, 2024 has demonstrate that coefficients and significance for ROA drivers differ between pre covid (Stable) and covid (unstable) periods.

Table XV: Summary of the Hypothesis results

Hypotheses	P value	Coef. Value	Results
H1	0.023	-0.3188	Accepted
H2	0.001	0.1725	Accepted
H3	0.128	-0.1812	Rejected
H4	0.739	-0.0031	Rejected
H5	0.049	0.0464	Accepted
H6	0.000	0.0174	Accepted
H7	0.000	0.5609	Accepted
H8	0.000	0.4289	Accepted

Source: Authors compiled based on Research Findings

Conclusion

This study aimed to identify the impact of financial ratios on the financial performance of Sri Lankan listed life insurance companies in stable and unstable economies. The study found that solvency margin is a key indicator of the financial performance of the Sri Lankan Life Insurance industry, with a stronger impact in stable economies. The reinsurance ratio has a negative impact on Return on Assets (ROA) in stable conditions but becomes significantly positive in unstable economies, emphasizing the importance of leveraging reinsurance as a risk management tool during economic uncertainty. The investment ratio positively affects ROA in both stable and unstable economies, emphasizing the importance of maintaining a well-diversified investment portfolio to protect returns and increase profitability. The debt ratio showed no significant effect on ROA across both economic conditions. The researchers concluded that during stable periods, companies should focus on optimizing investments and maintaining strong solvency margins, while during economic instability, the focus should be on using reinsurance to manage risks. These insights offer a useful roadmap for improving resilience and profitability in the ever-changing economic environment.

Implications of the study

The findings of this research study have mentioned the implications. The theoretical implications of this research study are that it documents evidence of the significant impact on the Return on Assets on the financial performance of life insurance companies in Sri Lanka in a stable and unstable economy and it contributes to the existing literature. This research provides the practical implications for Life insurance companies in Sri Lanka.

Furthermore, this study gives empirical support to Life insurers into manage their financial stability and financial performance in a financial crisis or in another difficult time. The findings of this research study also help the public to select the best insurers to buy their life insurance policies. Customers also can make decisions by looking at the financial performance of the life insurance companies. Furthermore, shareholders of the firms can also benefit by understanding the importance of the financial performance of Life insurers. This is a motivation element for all these listed life insurers to be energetically involved in effecting more successful strategies to moderate such risks in future and go for a continuous flow of processes.

Limitations of the study

The limitation of this research study is the sample size and availability of data. There are only a few life insurance companies listed in Sri Lankan Colombo Stock Exchange. The scholar has used only listed life insurance companies in Sri Lanka. The reason for it is the authors have used quarterly data. The published quarterly data is only available in Sri Lankan listed life insurance companies. Therefore, the researchers have to use only the listed life insurance companies.

There is another limitation of this research study. The authors have focused only on a few variables in this. So that it is not easy to find the impact on financial performance by using only a few variables. This study has excluded other potentially significant factors like premium growth, underwriting profits and macroeconomic indicators. Economic stability is categorized based on a specific timeframe, which might not capture the complexity of macroeconomic conditions.

Direction for Future Research

Future research should include all life insurance companies, general insurance companies, and composite insurance companies, analyzing each individually and equally. The study used limited variables; however, it could use macroeconomics variables and case studies for depth investigation and also could incorporate control variables such as firm size, firm age and macroeconomic indicators to account for additional factors that may influence financial performance. Future researchers could use the impacts of liquidity ratio, retention ratio, firm size, underwriting risk, firm age, and equity capital to compare results with those in developed markets. The Return on Assets was used as a measure of financial performance, but a better proxy could be the stock price return. Future research should also consider using case studies for deeper investigation.

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