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Exploring the role of insurance sector performance in driving economic growth in Bangladesh: A financial metrics perspective

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ABSTRACT

This study investigates the impact of insurance sector performance on economic growth in Bangladesh, using quantitative analysis of secondary data from 2009 to 2023. Data were collected from financial statements of insurance companies, reports from the Bangladesh Insurance Association (BIA), regulatory reports from the Insurance Development and Regulatory Authority (IDRA), and macroeconomic data from the Bangladesh Bureau of Statistics (BBS) and the World Bank. Key performance indicators analyzed include Claims Settlement Ratio (CSR), Management Expense Ratio (MER), Return on Investment (ROI), Investment to Total Assets Ratio (IOTAR), and Risk Retention Ratio (RRR), with GDP growth as the dependent variable. Multiple regression and time-series analyses reveal that CSR and ROI positively influence GDP, with CSR showing significant effects and ROI exhibiting marginal significance. Conversely, RRR negatively impacts GDP, suggesting that higher risk retention can hinder economic growth. MER and IOTAR do not show significant effects. The study emphasizes the need for improving claims settlement efficiency, maximizing returns on investment, and implementing effective risk management to support economic stability. The findings offer policy insights for strengthening the insurance sector's role in fostering sustainable economic growth in Bangladesh.

I. Introduction

The insurance sector is a cornerstone of the financial system, playing a critical role in risk management, financial stability, and economic growth. In emerging economies like Bangladesh, the performance of the insurance sector is increasingly recognized as a significant driver of broader economic development. Over the past decade, the Bangladeshi insurance industry has experienced considerable growth, fueled by growing awareness of risk management and a series of regulatory reforms designed to strengthen the sector (Bari, 2021). Despite this progress, the direct impact of the insurance sector's performance on economic growth remains underexplored. This study seeks to bridge this gap by investigating the relationship between key financial metrics of the insurance sector and economic growth in Bangladesh (GolzareNabi et al., 2019; Lee et al., 2016). Globally, the contribution of the insurance sector to economic growth is well-documented. Insurance markets enhance economic expansion by promoting risk mitigation, mobilizing savings, and facilitating long-term investments. A developed insurance sector not only improves resource allocation but also boosts productivity and economic resilience (Arena, 2008). For example, functioning insurance markets allow individuals and businesses to transfer risks, creating a favorable environment for investment and entrepreneurship. Moreover, insurance companies, acting as institutional investors, channel policyholders' premiums into capital markets, supporting capital formation and market development (Olarinre et al., 2020; Beck et al., 2003).

In Bangladesh, the insurance sector's role is particularly critical, given the country's vulnerability to natural disasters and economic volatility. The sector's ability to manage financial risks associated with these challenges is essential for ensuring economic stability and growth. However, despite growth, the sector still faces significant challenges that limit its potential.

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Notably, Bangladesh's insurance penetration rate remains below 1%, signaling ample opportunity for expansion (Ali, 2020). Additionally, operational inefficiencies, such as delays in claims processing and high management expenses, undermine the sector's ability to contribute effectively to economic development (Rashid, 2019). These inefficiencies not only hamper consumer trust but also negatively affect the overall performance of insurance companies, impacting their contribution to GDP growth. Financial metrics such as the Claims Settlement Ratio (CSR), Management Expense Ratio (MER), Return on Investment (ROI), and Risk Retention Ratio (RRR) are vital for assessing the efficiency and performance of insurance companies. CSR, which reflects an insurer's ability to honor claims, is crucial for maintaining consumer confidence and market stability. A higher CSR signifies a company's financial health and its potential to contribute to economic growth (Olarinre et al., 2020). Similarly, the MER, which measures operational efficiency, indicates how well an insurer controls costs. High MERs can reduce profitability and restrict the sector's growth potential. The ROI, which gauges how effectively insurance companies deploy their resources, can influence broader economic outcomes by promoting capital market development (Beck et al., 2003). Finally, the RRR, which reflects the proportion of risk retained by an insurer, is key to balancing financial stability with profitability. Improper risk retention can lead to financial instability, negatively impacting the broader financial system (Ullah et al., 2016; Cummins et al., 2006). This study aims to examine how these financial metrics influence economic growth in Bangladesh. By analyzing their effects on GDP growth, the research seeks to provide empirical evidence of the insurance sector's contribution to the nation's economic development. The insights gained will help inform policymakers and industry stakeholders in addressing existing challenges and enhancing the sector's role in sustainable economic growth.

This study is significant as it addresses a critical research gap in understanding the relationship between insurance sector performance and economic growth in Bangladesh. While much has been written about the role of insurance in developed economies, empirical evidence linking insurance metrics directly to GDP growth in emerging markets, particularly Bangladesh, remains scarce. Existing literature often overlooks how key performance indicators such as the Claims Settlement Ratio (CSR), Return on Investment (ROI), and Risk Retention Ratio (RRR) specifically influence economic outcomes in countries with low insurance penetration and unique socio-economic challenges. This research offers new insights into how these financial metrics impact economic stability and growth in Bangladesh, a country that faces vulnerability to natural disasters and economic volatility. By focusing on Bangladesh's underdeveloped insurance sector, this study provides valuable policy recommendations to enhance the sector's contribution to long-term economic development, addressing an essential but overlooked area in both academic and practical discussions on financial sector growth in emerging economies.

2. Literature Review of the Study

The insurance sector is a fundamental component of the financial system, contributing significantly to economic stability and growth. By providing risk management solutions, mobilizing savings, and facilitating investments, insurance markets play a crucial role in economic development. This literature review examines the theoretical frameworks, empirical evidence, and specific context of Bangladesh to explore the relationship between insurance sector performance and economic growth.

2.1. Theoretical framework

2.1.1. Risk management theory

Insurance is integral to risk management, allowing individuals and businesses to transfer risks and uncertainties. The risk management theory posits that by offering protection against potential financial losses, insurance promotes economic activities and investments (Tsvetkova et al., 2019). When risks are mitigated, individuals and businesses are more likely to engage in economic activities that drive growth. This theory underscores the importance of a well-functioning insurance sector in fostering a stable and conducive environment for investment and entrepreneurship (Haiss et al., 2008).

2.1.2.Financial intermediation theory

The financial intermediation theory highlights the role of insurance companies as institutional investors. Insurance firms collect premiums from policyholders, which are then invested in financial markets. These investments contribute to capital formation and market development, supporting broader economic growth (Merton et al., 1995). By channeling funds into productive investments, insurance companies enhance liquidity in capital markets and support economic expansion.

2.1.3.Theories of economic development and financial stability

Theories linking financial development to economic growth emphasize that financial systems, including insurance markets, contribute to economic stability and growth by improving resource allocation. The development of insurance markets enhances financial stability by diversifying risk and improving the efficiency of financial intermediation. This stability, in turn, supports sustained economic growth by fostering a favorable investment climate (Levine, 2005).

2.2 Empirical evidence on ınsurance and economic growth

2.2.1 Cross-country studies

Empirical research has established a positive correlation between insurance sector development and economic growth. Arena (2008) conducted a cross-country study and found that both life and non-life insurance markets positively influence GDP growth. The study highlighted

that developed insurance markets improve financial stability, enhance resource allocation, and support investment activities, contributing to economic expansion. Beck and Webb (2003) investigated the determinants of life insurance consumption across countries and found that life insurance has a significant positive effect on economic growth. Their research demonstrated that life insurance provides long-term savings and investment funds, which are crucial for economic development. The study also emphasized that insurance markets contribute to financial depth and stability, which are essential for fostering economic growth.

2.2.2 Developing countries

Research focusing on developing countries further supports the positive relationship between insurance sector development and economic growth. Masci, Tejerina and Webb (2007) analyzed insurance markets in Latin America and the Caribbean and found that well-developed insurance sectors contribute significantly to economic growth. Their study indicated that insurance markets enhance financial stability, mobilize savings, and support investment activities, all of which are vital for economic development in emerging economies.

In the context of Asian economies, research by Lee et al. (2016) examined the impact of insurance sector development on economic growth in East Asian countries. The study found that insurance markets contribute positively to GDP growth by providing risk management solutions, mobilizing savings, and supporting capital market development. This research underscores the role of insurance in enhancing economic stability and promoting investment in developing regions.

2.3 Insurance sector performance metrics

2.3.1 Claims settlement ratio

The claims settlement ratio is a crucial indicator of an insurance company's performance. It measures the proportion of claims settled relative to the total claims made by policyholders. A higher claims settlement ratio reflects an insurer's ability to honor claims, which is essential for maintaining consumer trust and market confidence. According to Olarinre et al. (2020) a higher claims settlement ratio is associated with improved customer satisfaction and financial stability, which can contribute positively to economic growth.

Wong (2022) found that insurance companies with higher claims settlement ratios tend to have better market penetration and financial stability. Their research suggests that an efficient claims settlement process enhances the overall performance of the insurance sector and supports economic growth by building consumer confidence and increasing market participation.

2.3.2. Management expense ratio

The management expense ratio indicates the efficiency of an insurance company in managing its operational costs. High management expenses can erode profitability and limit the sector's ability to contribute to economic growth. Cummins and Rubio-Misas (2006) demonstrated that insurance companies with lower management expense ratios are more efficient and have a greater positive impact on economic development. Efficient management practices reduce operational costs and improve profitability, thereby enhancing the sector's contribution to GDP growth.

2.3.3. Return on investment (ROI)

ROI measures how effectively insurance companies utilize their resources to generate returns. High ROI indicates sound investment strategies and financial health, which can positively influence capital market development and economic growth. Beck and Webb (2003) found that insurance companies with higher ROI contribute more to economic growth by investing in productive sectors and supporting capital market development. Singhal et al. (2020) further confirmed that higher ROI is associated with increased economic growth, as it reflects the efficient allocation of resources and investment in growth-oriented activities.

2.3.4. Risk retention rate

The risk retention rate represents the proportion of risk retained by an insurance company. A balanced risk retention rate is essential for ensuring financial stability while maximizing profitability. Outreville (1996) highlighted that appropriate risk retention practices contribute to financial stability and support economic growth by maintaining insurer solvency and market confidence. Beck et al. (2009) further emphasized that imbalances in risk retention can lead to financial distress and instability in the financial system, which can negatively impact economic growth.

2.4 The Insurance sector in Bangladesh

2.4.1. Growth and development

The insurance sector in Bangladesh has experienced significant growth over the past decade, driven by increased awareness of risk management and regulatory reforms. The Insurance Development and Regulatory Authority (IDRA) has implemented policies to strengthen the industry, including the Insurance Act of 2010, which aims to improve transparency, governance, and competition (Islam, 2019).

These reforms have led to increased consumer confidence and market expansion. Despite these positive developments, the Bangladeshi insurance sector faces several challenges. The penetration rate remains below 1%, indicating significant room for growth (Ali, 2020). Low penetration is attributed to factors such as limited product offerings, lack of awareness, and inefficiencies in claims processing. High management expenses and operational inefficiencies further impede the sector's contribution to economic growth (Ali, 2020).

2.4.2. Financial metrics and performance

Recent studies on the Bangladeshi insurance sector emphasize the need for improved efficiency and performance. Karim et al. (2023) explored the impact of financial metrics on the performance of insurance companies in Bangladesh. The study highlighted that improving the claims settlement ratio and reducing management expenses are crucial for enhancing the sector's contribution to GDP growth. The research also underscored the importance of regulatory reforms in addressing inefficiencies and promoting market expansion.

Ali (2020) analyzed the challenges and opportunities facing the Bangladeshi insurance sector and identified key areas for improvement. The study emphasized the need for increased market penetration, improved claims processing, and enhanced operational efficiency to support economic growth. The research also highlighted the potential benefits of adopting international best practices and strengthening regulatory frameworks to enhance the sector's performance. The literature indicates a robust relationship between insurance sector performance and economic growth, supported by theoretical frameworks and empirical evidence. Key financial metrics such as the claims settlement ratio, management expense ratio, ROI, and risk retention rate are essential for assessing insurance sector performance and its impact on economic development. In Bangladesh, the insurance sector has demonstrated growth potential but faces challenges that hinder its full contribution to economic growth. Addressing these challenges and improving financial metrics are crucial for enhancing the sector's role in supporting sustainable economic development. This research aims to contribute to this understanding by providing empirical evidence on the relationship between insurance sector performance and GDP growth in Bangladesh.

2.5 Justification for Selecting Bangladesh as the Focal Region

Bangladesh has been chosen as the focal region for this study due to its unique economic and insurance sector characteristics, making it an ideal context for exploring the relationship between insurance performance and economic growth. Despite its rapid economic development in recent years, Bangladesh remains one of the most vulnerable countries to natural disasters, economic volatility, and a relatively low insurance penetration rate, which currently stands below 1% (Ali, 2020). The insurance sector in Bangladesh faces significant operational inefficiencies, such as slow claims processing and high management expenses, which hinder its potential contribution to GDP growth. This presents an opportunity to evaluate how key performance indicators, like Claims Settlement Ratio (CSR), Return on Investment (ROI), and Risk Retention Ratio (RRR), can influence economic outcomes in such a context.

Furthermore, Bangladesh is undergoing significant regulatory reforms aimed at improving transparency, governance, and competition in the insurance market (Islam, 2019). These reforms, along with growing awareness of risk management, create a dynamic environment in which the performance of the insurance sector is poised to impact economic growth. Given these factors, Bangladesh offers a distinct and relevant case study for examining the link between insurance sector efficiency and economic development.

While similar countries with comparable economic conditions (e.g., other South Asian nations or emerging economies in Southeast Asia) could also provide valuable insights, Bangladesh’s specific context—characterized by low insurance penetration, vulnerability to natural disasters, and a rapidly developing financial sector—makes it a compelling focus for this study. The challenges and opportunities in Bangladesh's insurance market are not only unique but also offer broader lessons for other emerging economies facing similar structural challenges in their insurance sectors. Focusing solely on Bangladesh allows for a more in-depth, contextually relevant analysis that can inform targeted policy recommendations for its economic development.

3. Methodology of the Study

This study utilized a quantitative approach to examine the relationship between insurance sector performance and economic growth in Bangladesh, using secondary data from 2009 to 2023. The data sources included annual financial statements of insurance companies, reports from the Bangladesh Insurance Association (BIA), and regulatory documents from the Insurance Development and Regulatory Authority (IDRA). Macroeconomic data, specifically GDP figures, were obtained from the Bangladesh Bureau of Statistics (BBS) and the World Bank. Key independent variables included the claims settlement ratio (CSR), management expense ratio (MER), return on investment (ROI), investment to total assets ratio (IOTAR), and risk retention rate (RRR), with GDP growth serving as the dependent variable (Işık et al., 2025; Şenol et al., 2020; Kjosevski, 2011).

To assess the collective influence of these metrics on GDP growth, the study employed multiple regression analysis. This approach allowed for the evaluation of the simultaneous impact of each insurance sector metric, while controlling for others. Additionally, time-series analysis was used to capture trends over the 15-year period, providing insights into the evolving relationship between the insurance sector and economic growth. Pearson correlation analysis further determined the strength and direction of individual relationships between the variables and GDP growth.

The study included all licensed general insurance companies active during the period to ensure comprehensive representation of the sector. Data were meticulously cleaned and cross-verified for accuracy. The study acknowledged potential limitations such as incomplete data

and external economic influences that could affect the results. Ethical considerations, including data anonymization and maintaining research integrity, were rigorously followed throughout the analysis. This methodology provided valuable insights into how insurance sector performance metrics influence GDP growth, offering empirical evidence that can inform policy decisions and strategic initiatives by industry stakeholders and policymakers aiming to strengthen the insurance sector's role in Bangladesh's economic development.
Regression equation is as follows

$$GDP = \beta_0 + \beta_1 CSR + \beta_2 MER + \beta_3 ROI + \beta_4 IOTAR + \beta_5 RRR + \mu$$

Where

GDP = Gross Domestic Product, CSR= Claims Settlement Ratio, MER = Management Expense Ratio, ROI= Return On Investment

IOTAR = Investment to Total Assets Ratio, RRR= Risk Retention Rate, β_0 = Intercept of relationship in the model/constant, $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$= Coefficients of each independent or explanatory variable, μ = Error term

4. Analysis and Findings

4.1.Descriptive statistics

The study has employed descriptive statistics to outline the characteristics of the variables included in the linear regression model, as detailed in the following table.

Table 1: Descriptive statistics of variables

Variables	Range	Minimum	Maximum	Mean	Std. Deviation
GDP	4.43	3.45	7.88	6.29	1.07
CSR	20.71	18.60	39.31	26.24	5.68
MER	23.25	23.20	46.45	33.13	8.49
ROI	3.30	4.90	8.20	6.80	1.20
IOTAR	1.60	4.00	5.60	4.69	0.47
RRR	26.83	49.77	76.60	60.60	7.70

Table 1 provides a comprehensive overview of the key variables associated with the performance of Bangladesh's insurance sector and its relationship with economic growth. The GDP growth rate ranges from 3.45% to 7.88%, with a mean of 6.29% and a standard deviation of 1.07, reflecting moderate variability in economic performance. The Claims Settlement Ratio (CSR), which measures the ability of insurers to settle claims, shows moderate variability, ranging from 18.60% to 39.31%, with an average of 26.24% and a standard deviation of 5.68. This indicates a reasonable level of fluctuation in claims settlement efficiency across the industry. The Management Expense Ratio (MER) varies significantly, ranging from 23.20% to 46.45%, with a mean of 33.13% and a relatively high standard deviation of 8.49, highlighting differences in cost management and operational efficiency among insurers. Return on Investment (ROI) displays stability, with a mean of 6.80% and a standard deviation of 1.20, suggesting that most insurance companies achieve relatively consistent investment returns. The Investment to Total Assets Ratio (IOTAR), which shows how much of a company's assets are invested, is consistent, with a mean of 4.69% and a low standard deviation of 0.47, indicating a uniform investment approach across companies. Lastly, the Risk Retention Ratio (RRR), which reflects how much risk the insurers retain, ranges widely from 49.77% to 76.60%, with an average of 60.60% and a standard deviation of 7.70, pointing to considerable differences in risk management strategies across the industry. Collectively, these statistics reflect both stable and variable aspects of the insurance sector, providing insights into operational efficiency, risk management, and financial performance in Bangladesh.

4.2 Analysis of Bi-variate relationship between variable of zero order correlation matrix

Table 2: Correlations

	CSR	MER	ROI	ROA	RRR	GDP
CSR	1					
MER	0.892**	1				
	0.000					
ROI	0.281	0.095	1			
	0.310	0.737				
ROA	0.250	0.092	0.322	1		
	0.368	0.744	0.242			
RRR	-0.733**	-0.717**	-0.258	-0.116	1	
	0.002	0.003	0.354	0.679		
GDP	0.269	-0.034	0.323	0.604*	-0.295	1
	0.332	0.905	0.241	0.017	0.286	

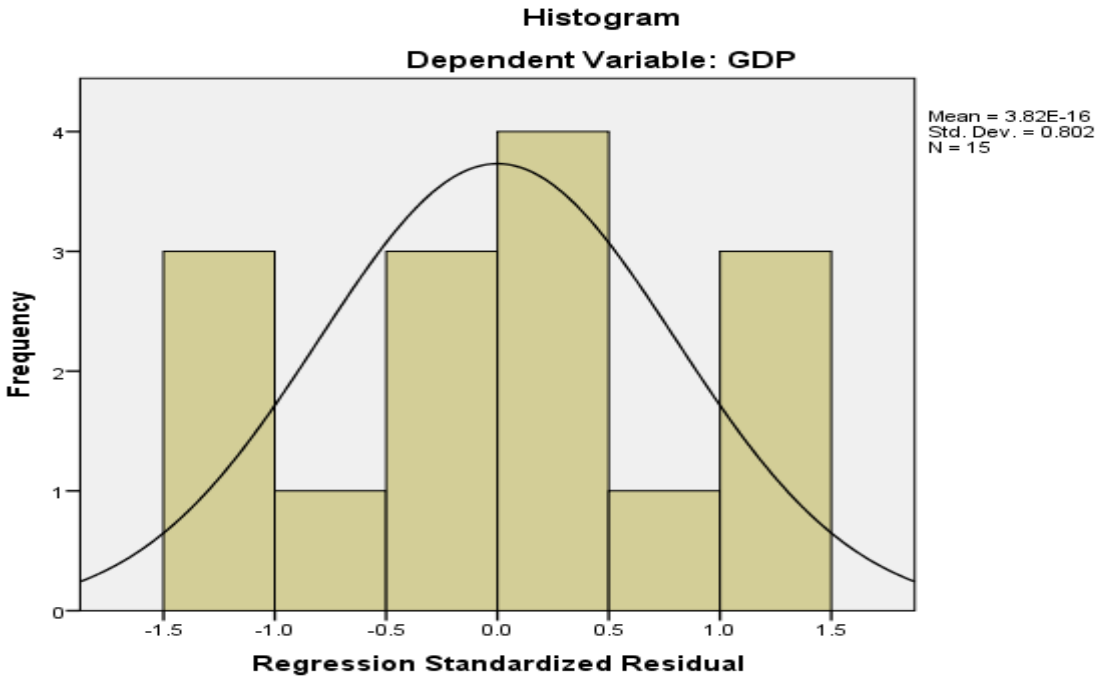
**. Correlation is significant at the 0.01 level (2-tailed).

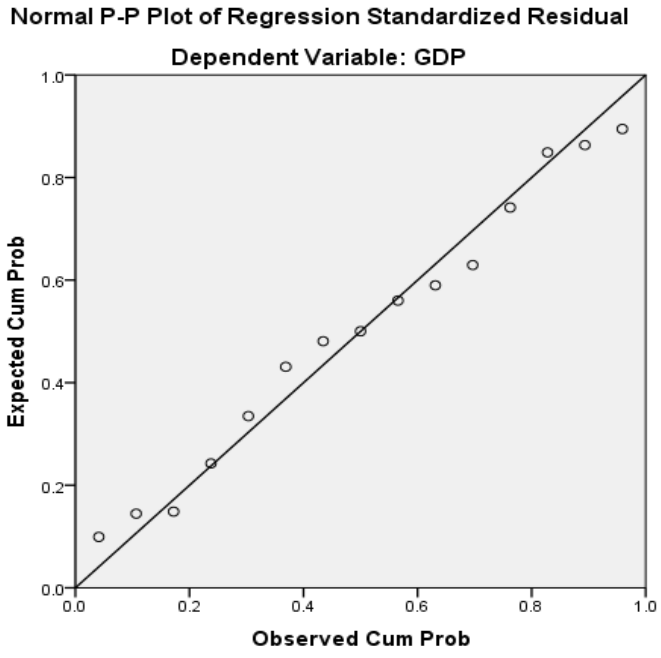
*. Correlation is significant at the 0.05 level (2-tailed).

Table 2 presents the correlation coefficients among the key variables used in the study, illustrating their relationships with each other and with GDP. The Claims Settlement Ratio (CSR) exhibits a strong positive correlation with the Management Expense Ratio (MER) ($r = 0.892$, $p < 0.01$), suggesting that as CSR increases, so does MER. However, CSR shows a moderate negative correlation with the Risk Retention Ratio (RRR) ($r = -0.733$, $p < 0.01$), indicating that higher claims settlement efficiency is associated with lower risk retention. The Return on Investment (ROI) has a weak positive correlation with CSR ($r = 0.281$) and a similarly weak relationship with MER ($r = 0.095$), indicating that variations in ROI are not strongly associated with CSR or MER. The Return on Assets (ROA) exhibits a moderate positive correlation with ROI ($r = 0.322$) but weak correlations with CSR ($r = 0.250$) and MER ($r = 0.092$). The RRR is negatively correlated with CSR ($r = -0.733$, $p < 0.01$) and MER ($r = -0.717$, $p < 0.01$), but has a weak positive correlation with ROI ($r = -0.258$) and ROA ($r = -0.116$). GDP shows a modest positive correlation with ROA ($r = 0.604$, $p < 0.05$), indicating that higher ROA is associated with increased economic growth. There are weaker correlations between GDP and other variables, with CSR ($r = 0.269$), MER ($r = -0.034$), ROI ($r = 0.323$), and RRR ($r = -0.295$), suggesting that while some variables have moderate relationships with GDP, the overall impact of these financial metrics on economic growth is varied (Işık et al., 2024; Islam et al., 2024; Bari, 2021; Olarinre et al., 2020).

4.3 Test of assumptions

4.3.1.Normality test





The provided histogram and P-P plot assess the normality of regression residuals with GDP as the dependent variable. In the histogram, the distribution of residuals is somewhat symmetrical, suggesting an approximate normal distribution, a key assumption in regression analysis (Gujarati et al., 2009). The mean of the residuals is close to zero, and the standard deviation is small, indicating minimal bias. The P-P plot further supports this, as most points lie along the diagonal, showing a good fit between observed and expected cumulative probabilities (Field, 2024; Rana et al., 2023). These visual tests suggest that the normality assumption holds for this dataset, reinforcing the validity of the linear regression model (Işık et al., 2024; Rekha et al., 2023; Islam et al., 2021; Brooks, 2014).

4.3.2.Multicollinearity Test:

Table-3: Multicollinearity test among ındependent variables

Independent Variables	Collinearity Statistics	
	Tolerance	VIF
CSR	0.524	1.909
MER	0.750	1.333
ROI	0.820	1.219
IOTAR	0.429	2.332
RRR	0.689	1.451

Table 3 presents the multicollinearity test results among the independent variables, using Tolerance and Variance Inflation Factor (VIF) statistics. A VIF value above 10 or a Tolerance value below 0.1 suggests high multicollinearity (Gujarati & Porter, 2009). In this table, CSR and RRR, MER, ROI, and IOTAR show low VIF values, indicating no significant multicollinearity issues. Therefore, the majority of the independent variables demonstrate an acceptable level of multicollinearity, ensuring the reliability of regression estimates (Islam, 2019; Wooldridge, 2013).

4.3.3.Auto-Correlation Test

Table-4: Auto-correlation test

	Durbin-Watson
Dependent Variable: GDP	2.747
Predictors: (Constant), CSR, MER, ROI, IOTAR and RRR	

The Durbin-Watson statistic of 2.747, presented in Table 4, is used to detect the presence of autocorrelation in the residuals of the regression model, where GDP is the dependent variable. Since the statistic is close to 2 but slightly higher, this indicates a low to moderate negative autocorrelation in the model residuals (Gujarati & Porter, 2009). A value near 2 typically suggests no significant autocorrelation, which is ideal for maintaining the assumptions of linear regression (Field, 2024; Rana, 2024). This result supports the robustness of the regression model and indicates that autocorrelation is not a significant issue (Islam, 2025; Rana et al., 2022; Kugler et al., 2005; Wooldridge, 2015).

4.4. Analysis of insurance sector performance on economic growth

Table 5: Analysis of insurance sector performance on economic growth

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	6.377	4.095		1.557	0.154
CSR	0.184	0.093	0.974	1.982	0.049
MER	-0.086	0.193	-0.096	-0.444	0.668
ROI	1.030	0.469	0.454	2.196	0.056
IOTAR	-0.064	0.040	-0.460	-1.606	0.143
RRR	-0.160	0.059	-1.265	-2.697	0.024

	Sum of Squares	df	Mean Square	Value of F	Sig.
Regression	11.007	5	2.201	3.897	.037[b]
Residual	5.085	9	0.565		
Total	16.092	14			

r^2	0.684
Adjusted r^2	0.508

a. Dependent Variable: GDP, b. Predictors: (Constant), MER, ROA, ROI, RRR, CSR

The regression analysis presented in Table 5 investigates the relationship between various performance indicators of the insurance sector and economic growth (measured by GDP) in Bangladesh. This model incorporates several independent variables: claims settlement ratio (CSR), management expense ratio (MER), return on investment (ROI), investment-to-total-assets ratio (IOTAR), and risk retention ratio (RRR). The results highlight both positive and negative relationships between these indicators and economic growth.

The overall model is statistically significant, as indicated by an F-value of 3.897 and a p-value of 0.037. This suggests that the combination of the five independent variables (CSR, MER, ROI, IOTAR, and RRR) collectively has a significant influence on the dependent variable, GDP (Rana, 2024; Işık et al., 2024; Chowdhury et al., 2015). The R^2 value of 0.684 indicates that approximately 68.4% of the variance in GDP is explained by the independent variables. The adjusted R^2 of 0.508 corrects for the number of predictors, suggesting that over 50% of the variability in GDP is accounted for by the insurance sector's performance metrics after controlling for the complexity of the model. These results indicate a moderately strong relationship between the insurance sector's performance and economic growth (Işık et al., 2024; Karim et al., 2023; Fashagba, 2018).

The intercept (or constant) is 6.377, which is not statistically significant (p = 0.154). This implies that if all independent variables were zero, GDP would still maintain a baseline value of 6.377 Khan et al., 2013). However, the insignificance of the constant suggests that interpreting its value is less meaningful in this context, as the primary focus is on the relationship between the independent variables and GDP (Bhowmik et al., 2024; Rana et al., 2024; Ward et al., 2000).

Claims Settlement Ratio (CSR): The CSR has a positive standardized coefficient (β = 0.974), meaning it has a strong positive impact on economic growth. The unstandardized coefficient (B = 0.184) indicates that for each unit increase in the CSR, GDP increases by 0.184 units, holding all other variables constant. With a p-value of 0.049, CSR is statistically significant at the 5% significance level. This suggests that effective claims settlement in the insurance industry significantly contributes to economic growth, potentially by improving public confidence in insurance services and fostering financial stability, which supports macroeconomic growth (Sadhak, 2013).

Management Expense Ratio (MER): The MER has a negative standardized coefficient (β = -0.096), indicating a negative, but non-significant, relationship with GDP. The unstandardized coefficient (B = -0.086) suggests that for each unit increase in MER, GDP decreases by 0.086 units, although the effect is not statistically significant (p = 0.668). This suggests that higher management expenses within the insurance sector may lead to inefficiencies, reducing economic growth; however, the insignificance implies that this variable does not play a critical role in driving GDP changes in Bangladesh's context (Rana et al., 2023; Cummins et al., 2006).

Return on Investment (ROI): ROI has a positive and marginally significant impact on GDP, with a standardized coefficient of β = 0.454 and an unstandardized coefficient of B = 1.030. The p-value of 0.056 is slightly above the 5% significance threshold, suggesting a moderately strong relationship. A one-unit increase in ROI is associated with a 1.030-unit increase in GDP, all else being equal. This indicates that higher returns on investments made by insurance companies are positively correlated with economic growth, underscoring the importance of profitable investment portfolios in promoting broader economic activity (Ul Din et al., 2017; Beck et al., 2003).

Investment-to-Total-Assets Ratio (IOTAR): IOTAR has a negative standardized coefficient (β = -0.460) and an unstandardized coefficient of B = -0.064, meaning that increases in IOTAR are associated with decreases in GDP. The p-value of 0.143 indicates that this relationship is not statistically significant. While it might suggest that higher allocations to investments as a proportion of total assets could detract from economic growth, the lack of significance means this finding should be interpreted cautiously. It may reflect inefficiencies in the allocation of assets or underperformance in the investment strategies of insurance firms (Islam et al., 2024; Kaffash et al., 2020; Richterková et al., 2013).

Risk Retention Ratio (RRR): The RRR has a negative and statistically significant impact on GDP, with a standardized coefficient of β = -1.265 and an unstandardized coefficient of B = -0.160. The p-value of 0.024 suggests that this variable significantly influences GDP. A one-unit increase in the RRR is associated with a 0.160-unit decrease in GDP, indicating that higher risk retention by insurance companies, which means retaining more of the risk within the company rather than transferring it through reinsurance, can negatively impact economic growth. This could be due to the increased financial vulnerability of insurers, reducing their capacity to cover large claims, which could destabilize the financial system (Işık et al., 2024; Islam et al., 2023; Akinlo et al., 2014; Outreville, 1990).

The regression analysis reveals key insights into the relationship between the insurance sector and economic growth. Specifically, CSR and ROI have a positive influence on GDP, underscoring the importance of efficient claims processing and strong returns on investment in promoting economic growth. Conversely, RRR shows a significant negative impact, suggesting that retaining too much risk within the insurance sector can be detrimental to macroeconomic stability. The insignificance of MER and IOTAR suggests that these variables do not play a crucial role in explaining economic growth in this particular model, though further research might explore their indirect effects.

The regression results suggest that the insurance sector, through variables like CSR and ROI, has a notable influence on economic growth in Bangladesh. The negative impact of RRR highlights the risks associated with retaining too much risk within the sector. Policymakers and insurance firms should therefore focus on improving claims settlement efficiency and maximizing investment returns while managing risk retention effectively to ensure sustainable contributions to economic growth.

5. Conclusion

The study explored the relationship between the insurance sector's performance and economic growth in Bangladesh from 2009 to 2023, using quantitative methods and secondary data. The key variables investigated were the Claims Settlement Ratio (CSR), Management Expense Ratio (MER), Return on Investment (ROI), Investment to Total Assets Ratio (IOTAR), and Risk Retention Ratio (RRR), with GDP growth as the dependent variable. By analyzing financial and macroeconomic data from various sources, including insurance company reports, the Bangladesh Bureau of Statistics (BBS), and the World Bank, the study aimed to assess how these insurance sector metrics collectively influence

economic growth. Multiple regression analysis revealed the overall model was statistically significant, with the combination of the five independent variables explaining 68.4% of the variance in GDP growth. This suggests a strong relationship between the performance of Bangladesh's insurance sector and economic growth. Additionally, Pearson correlation analysis was used to determine the strength of the relationships between each variable and GDP, providing insights into the specific influence of each factor on economic growth.

The study found that CSR had a significant positive effect on GDP, indicating that as insurance companies improve their claims settlement efficiency, there is a positive impact on economic growth. This could be due to increased public confidence in the insurance industry, leading to greater financial security and stability, which in turn fosters economic expansion. The standardized coefficient ($\beta = 0.974$) suggests that CSR plays a substantial role in driving growth. This finding aligns with previous research, which highlights the importance of efficient claims processing in stabilizing financial markets and promoting economic growth. Similarly, ROI demonstrated a positive relationship with GDP, though it was only marginally significant. A one-unit increase in ROI was associated with a 1.030-unit increase in GDP, emphasizing the role of investment returns in the insurance sector's contribution to economic growth. This suggests that insurance companies in Bangladesh, by generating profitable returns from their investments, can provide greater support for economic activities. This finding reinforces the view that financial stability and profitability within the insurance industry are essential for broader economic development.

In contrast, the RRR had a statistically significant negative impact on GDP. The study found that as insurers retained more risk, economic growth was negatively affected. This could be because higher risk retention limits insurers' ability to manage large claims effectively, making the sector more vulnerable to financial instability. This finding highlights the need for insurance companies to carefully balance risk retention with adequate reinsurance to protect both their financial health and the broader economy. The significant negative effect of RRR suggests that excessive risk retention can hinder the sector's ability to support economic stability, underscoring the importance of prudent risk management. Interestingly, both MER and IOTAR were found to have no statistically significant relationship with GDP. While MER showed a negative relationship, suggesting that higher management costs might reduce operational efficiency, its insignificance implies that it does not play a critical role in driving GDP growth. IOTAR, though negatively related to GDP, was also not significant, indicating that variations in how insurance companies allocate their assets to investments do not have a substantial impact on economic growth. These findings suggest that management expenses and investment strategies, while important for internal efficiency, may not directly influence macroeconomic performance.

In conclusion, the study highlights the crucial role of CSR and ROI in driving economic growth in Bangladesh, suggesting that improvements in claims settlement and investment returns can significantly contribute to GDP growth. Conversely, excessive risk retention, as reflected in the RRR, poses a threat to economic stability. Policymakers and industry stakeholders should focus on optimizing claims processing and maximizing investment returns, while managing risk retention carefully, to ensure that the insurance sector continues to support sustainable economic growth. These findings offer valuable insights for developing strategies to enhance the insurance sector's contribution to the country's economic development.

6. Policy Implications and Suggestions

The study presents several policy implications aimed at enhancing the insurance sector's contribution to Bangladesh's economic growth. First, improving claims settlement efficiency is crucial to building consumer trust and boosting market participation. Policymakers should mandate digital platforms and automated systems for faster claims processing. Promoting strategic investments in high-growth sectors like infrastructure and renewable energy through incentives can drive economic development. Additionally, managing risk retention by encouraging participation in reinsurance markets will help stabilize the sector. Improving operational efficiency by adopting automation and reducing costs will further strengthen the sector's performance. Expanding insurance coverage, particularly through awareness campaigns and micro-insurance products, is key to increasing market penetration. Innovation should be fostered by encouraging insurers to diversify their products and adopt new technologies, with regulatory sandboxes to test innovative solutions. Strengthening regulatory oversight, promoting transparency, and ensuring consistent audits will ensure the sector's stability. Public-private partnerships (PPPs) can leverage combined resources for large-scale insurance programs, especially in areas like disaster risk management and agriculture. Finally, facilitating international collaboration will bring valuable expertise and investment, enhancing the sector's capacity to contribute to economic growth. Together, these measures will help create a more efficient, robust, and growth-oriented insurance industry in Bangladesh.

7. Study Limitations and Directions for Future Research

This study has several limitations that should be considered. First, the reliance on secondary data from sources such as the Bangladesh Bureau of Statistics (BBS) and the Insurance Development and Regulatory Authority (IDRA) introduces potential data quality concerns, including missing values or reporting inconsistencies, particularly from smaller, less transparent insurance companies. Moreover, this research focuses primarily on the general insurance sector, which may not fully capture the dynamics of life insurance, a sector with distinct implications for economic growth. Additionally, external macroeconomic factors, such as global financial crises or policy changes, may influence the results, making it challenging to isolate the effects of insurance sector performance alone. The study's 15-year timeframe also limits the ability to identify long-term trends or assess the insurance sector's evolving impact on economic development. Future research could address these limitations by expanding the scope to include both general and life insurance sectors, providing a more comprehensive view of the industry's role in economic growth. Longitudinal studies extending beyond 2023 would offer valuable insights into long-term trends and the lasting effects of regulatory reforms. Cross-country comparisons with other emerging economies could further deepen our understanding of how insurance

markets influence GDP growth in regions with similar socio-economic conditions. Finally, exploring behavioral factors and the impact of regulatory changes would help refine policy recommendations and strengthen the insurance sector's contribution to economic development.

Abbreviations:

Table 6: Abbreviations

BIA	Bangladesh Insurance Association
IDRA	Insurance Development and Regulatory Authority
BBS	Bangladesh Bureau of Statistics
CSR	Claims Settlement Ratio
MER	Management Expense Ratio
ROI	Return on Investment
IOTAR	Investment to Total Assets Ratio
RRR	Risk Retention Ratio
GDP	Gross Domestic Product
VIF	Variance Inflation Factor

Declarations

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References

Akinlo, T., & Apanisile, O. T. (2014). Relationship between insurance and economic growth in Sub-Saharan African: A panel data analysis. Modern Economy, 5(02), 120-127.

Ali, M. (2020). Challenges, prospects and role of insurance on economic growth in Bangladesh. IIUM J. of Case Studies in Man., 11(1), 20-27.

Arena, M. (2008). Does insurance market activity promote economic growth? A cross-country study for industrialized and developing countries. Journal of Risk and Insurance, 75(4), 921-946.

Bari, M. S. (2021). Role of insurance industry on economic challenges prospect growth in bangladesh. American Journal of Economics and Business Management, 4(1), 1-16.

Beck, T., & Webb, I. (2003). Economic, demographic, and institutional determinants of life insurance consumption across countries. World Bank Economic Review, 17(1), 51-88.

Bhowmik, P. K., & Karmakar, G. (2024). Loan growth drivers in state-owned banks: A fixed effects model approach. Journal of Ekonomi, 7(1), 28-39. https://doi.org/10.58251/ekonomi.1560944

Brooks, C. (2019). Introductory econometrics for finance. Cambridge university press.

Chowdhury, S., & Roy, S. (2015). Evaluating the impact of insurance companies in the development of insurance practices in Bangladesh. Scholar Journal of Business and Social Science, 1(1), 37-42.

Cummins, J. D., & Rubio-Misas, M. (2006). Deregulation, consolidation, and efficiency: Evidence from the Spanish insurance industry. Journal of Money, Credit and Banking, 38(2), 323-355.

Fashagba, M. O. (2018). The impact of insurance on economic growth in Nigeria. Afro Asian Journal of Social Sciences, 9(1), 1-10.

Field, A. (2024). Discovering statistics using IBM SPSS statistics. Sage publications limited.

GolzareNabi, M., & Rahman, M. M. (2019). Exploring potentials and challenges of Takaful in Bangladesh. The Quarterly Journal of Islamic Economics Research Bureau, 29(01).

Gujarati, D. N., & Porter, D. C. (2009). Basic econometrics (5th ed.). McGraw-Hill.

Haiss, P., & Sümegi, K. (2008). The relationship between insurance and economic growth in Europe: a theoretical and empirical analysis. Empirica, 35, 405-431.

Işık, C., Bulut, U., Ongan, S., Islam, H., & Irfan, M. (2024). Exploring how economic growth, renewable energy, internet usage, and mineral rents influence CO2 emissions: A panel quantile regression analysis for 27 OECD countries. Resources Policy, 92, 105025.

Işık, C., Ongan, S., & Islam, H. (2024). A new pathway to sustainability: Integrating economic dimension (ECON) into ESG factors as (ECON-ESG) and aligned with sustainable development goals (SDGs). Journal of Ekonomi, 6(1), 34-39. https://doi.org/10.58251/ekonomi.1450860

Işık, C., Ongan, S., & Islam, H. (2024). Global environmental sustainability: the role of economic, social, governance (ECON-SG) factors, climate policy uncertainty (EPU) and carbon emissions. Air Quality, Atmosphere & Health, 1-16.

Işık, C., Ongan, S., Islam, H., Balsalobre-Lorente, D., & Sharif, A. (2024). ECON-ESG factors on energy efficiency: Fostering sustainable development in ECON-growth-paradox countries. Gondwana Research, 135, 103-115.

Işık, C., Ongan, S., Islam, H., Sharif, A., & Balsalobre-Lorente, D. (2024). Evaluating the effects of ECON-ESG on load capacity factor in G7 countries. Journal of Environmental Management, 360, 121177.

Işık, C., Ongan, S., Yan, J., & Islam, H. (2025). Towards Carbon Neutrality & Baku/Azerbaijan-Belem/Brazil: Exploring the Impacts of Economic, Environmental, Social, and Governance (ECON-ESG) Factors on Climate Policy Uncertainty (CPU) for Sustainable Dev.. *Heliyon*.

Islam, H. (2025). Nexus of economic, social, and environmental factors on sustainable development goals: The moderating role of technological advancement and green innovation. *Innovation and Green Development*, *4*(1), 100183.

Islam, H., Islam, M. S., Saha, S., Tarin, T. I., et al. (2024). Unveiling the nexus of macroeconomic factors on bank performance in Bangladesh. Journal of Ekonomi, 6(2), 64-74. https://doi.org/10.58251/ekonomi.1467784

Islam, H., Johora, F., Abbasy, A. A., Rana, M., & Antoine, N. (2021). The perceived impact of COVID-19 pandemic on healthcare cost in Bangladesh. Journal of Global Business Insights, 6(2), 172-185.

Islam, H., Rana, M., Saha, S., Khatun, T., Ritu, M.R. and Islam, M.R. (2023). Factors influencing the adoption of cryptocurrency in Bangladesh: an investigation using the technology acceptance model (TAM), Technological Sustainability, 2(4), 423-443.

Islam, H., Soumia, L., Rana, M., Madavarapu, J.B. and Saha, S. (2024), "Nexus between perception, purpose of use, technical challenges and satisfaction for mobile financial services: theory and empirical evidence from Bangladesh", Technological Sustainability, 3(2), 147-170. https://doi.org/10.1108/TECHS-10-2023-0040

Islam, N. (2019). Challenges for increasing insurance awareness among the people of Bangladesh. In Training Workshop on Raising Awareness Regarding Insurance, June: 1-16.

Kaffash, S., Azizi, R., Huang, Y., & Zhu, J. (2020). A survey of data envelopment analysis applications in the insurance industry 1993–2018. European journal of operational research, 284(3), 801-813.

Karim, R., Hasan, M. M., Waaje, A., Yesmin, M. S. H., & Roshid, M. M. (2023). Financial Performance of Bangladeshi Listed Commercial Banks: A Generation-based Analysis. International Journal of Finance & Banking Studies. (2147-4486), 12(4), 46-56.

Khan, M. S. U., & Uddin, M. N. (2013). Insurance industry in Bangladesh: opportunities and challenges. Thoughts on Econ., 23(4), 55-77.

Kjosevski, J. (2011). Impact of insurance on economic growth: The case of Republic of Macedonia. European J. of Bus. & Econ. 4, 34-39.

Kugler, M., & Ofoghi, R. (2005, September). Does insurance promote economic growth? Evidence from the UK. In Money Macro and Finance (MMF) Research Group Conference. 8, 1-27.

Lee, C. C., Chang, C. H., Arouri, M., & Lee, C. C. (2016). Economic growth and insurance development: The role of institutional environments. Economic Modelling, 59, 361-369.

Levine, R. (2005). Finance and Growth: Theory and Evidence. Handbook of Economic Growth, 1.

Masci, P., Tejerina, L., & Webb, I. (2007). Insurance market development in Latin America and the Caribbean.

Merton, R. C., & Bodie, Z. (1995). A conceptual framework for analyzing the financial system. The global financial system: A functional perspective, 3-31.

Olarinre, O. T., Sunday, S. O., & Gabriel, E. D. (2020). Effects of claims management on profitability of insurance companies in Nigeria. British Journal of Management and Marketing Studies, 3(4), 106-114.

Outreville, J. F. (1990). The economic significance of insurance markets in developing countries. J. of Risk and Insurance, 57(3), 487-498.

Rana, M (2024). Bangladesh's foreign exchange reserves: A comparative study with key South Asian economies. Int J. Foreign Trade Int Bus, 6(1), 80-85.

Rana, M (2024). Navigating post-pandemic challenges: Bangladesh faces BoP deficit and rising inflation. Int. J. Res. Manage, 6(1), 370-376.

Rana, M. (2024). Monetary Policy Challenges in Bangladesh: A Regulatory and Banking Perspective. Reforma, (99), 23-41.

Rana, M., & Al Mamun, A. (2024). Monetary policy dynamics and economic performance in Bangladesh: An arima model approach. *Journal of Economics and Research*, *5*(1), 47-62.

Rana, M., Al Mamun, A., Hossain, M. K., & Islam, H. (2024). Exploring the dynamics of Bangladesh bank's monetary policy: A factor analysis approach. Journal of Ekonomi, 6(1), 1-17.

Rana, M., Al Mamun, M. A., Hossain, M. K., & Rekha, R. S. (2021). The nexus between scholarship programs and higher education. SN Social Sciences, 1, 1-23.

Rana, M., Al Mamun, M. A., Hossain, M. K., & Rekha, R. S. (2023). Monetary Policy Efficacy for Price Stability: An In-depth Analysis of Bangladesh's Economic Landscape. AIUB Journal of Business and Economics, 20(2), 52-66.

Rana, M., Hossain, M. K., & Rekha, R. S. (2023). The Operational Aspects of Monetary Policy in Controlling the Demand and Supply of Money. Journal of Business Studies, 4(1), 177–200. https://doi.org/10.58753/jbspust.4.1.2023.26

Rana, M., Rekha, R. S., & Islam, H. (2022). The impact of digitalization on the economic growth of Bangladesh. J. of Bus. Stud., 3(1), 107-118.

Rekha, R. S., Hossain, M. I., & Rana, M. (2023). The Influence of the COVID-19 Pandemic on the Uptake of Technology-Enabled Banking in Bangladesh. Journal of Business Studies, 4(1), 276–296. https://doi.org/10.58753/jbspust.4.1.2023.31

Richterková, Z., & Koráb, P. (2013). Impact of insurance sector activity on economic growth—A meta analysis. Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis, 61(7), 2677-2683.

Sadhak, H. (2013). Life insurance in India: Opportunities, challenges, and strategic perspectives. SAGE Publications.

Şenol, Z., Zeren, F., & Canakci, M. (2020). The relationship between insurance and economic growth. Montenegrin J. of Economics, 16(4).

Singhal, N., Goyal, S., & Singhal, T. (2020). Insurance–growth nexus: empirical evidence from emerging Asian markets. Transnational Corporations Review, 12(3), 237-249.

Tsvetkova, L., Yurieva, T., Orlaniuk-Malitskaia, L., & Plakhova, T. (2019). Financial intermediary and insurance companies: Assessing financial stability. Montenegrin Journal of Economics, 15(3), 189-204.

Ul Din, S. M., Abu-Bakar, A., & Regupathi, A. (2017). Does insurance promote economic growth: A comparative study of developed and emerging/developing economies. Cogent Economics & Finance, 5(1), 1390029.

Ullah, G. M., Faisal, M. N., & Zuhra, S. T. (2016). Factors determining profitability of the insurance industry of Bangladesh. International Finance and Banking, 3(2), 138-147.

Ward, D., & Zurbruegg, R. (2000). Does insurance promote economic growth? Evidence from OECD countries. J. Risk & insurance, 489-506.

Wong, W. (2022). Factors influencing credit risk and insurance risk in general insurance of indonesia: technical reserve ratio and reinsurance ratio (financial management literature review). Dinasti International Journal of Management Science, 4(2), 195-208.

Wooldridge, J. M. (2013). Introductory Econometrics: A Modern Approach (5th ed.). Cengage Learning.

Wooldridge, J. M. (2015). Introductory econometrics: A modern approach. Cengage Learning.

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