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Risk Retention and the Performance of Nigeria Reinsurance Corporation (1994-2024)

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Abstract:

Purpose: *This study examines the influence of risk retention on the performance of the Nigeria Reinsurance Corporation, with specific emphasis on return on assets (ROA).*
Design/Methodology/Approach: *An ex post facto research design was adopted for the study. Secondary data were obtained from the published Financial Annual Reports of the Nigeria Reinsurance Corporation covering the period 1994–2024. Descriptive statistics and regression analysis using the ordinary least squares (OLS) technique were employed to analyse the effect of reinsurance risk retention ratio, reinsurance premium-to-surplus ratio, and reinsurance loss ratio on return on assets.*
Findings: *The empirical results reveal that reinsurance risk retention ratio, reinsurance premium-to-surplus ratio, and reinsurance loss ratio have significant effects on the return on assets of the Nigeria Reinsurance Corporation. The findings suggest that management should regularly evaluate whether the premium-to-surplus ratio is adequate to support underwriting activities. However, the study also highlights limitations associated with risk retention ratio analysis, particularly the challenge of inadequate historical data. Since the analysis relies on publicly disclosed historical financial data, ratio measures may not always accurately predict future performance.*
Practical Implications: *The findings provide useful benchmarks for management, rating agencies, and regulators in assessing the Corporation's solvency position and risk management practices. Improved risk retention and capital adequacy decisions can enhance credit ratings, strengthen stakeholder confidence, and ensure that the Corporation retains a sufficient level of risk from primary insurers without jeopardising financial stability.*
Originality/Value: *This study contributes to the reinsurance literature by providing empirical evidence on the relationship between risk retention indicators and firm performance in Nigeria. It establishes that maintaining a sustainable minimum reinsurance loss ratio is critical to improving the return on assets of the Nigeria Reinsurance Corporation.*

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1. Introduction

One Nigerian reinsurance provider is Nigeria Reinsurance Corporation. The reinsurance firms, the ceding company, investors, and other stakeholders all place a high value on risk retention analysis. Stakeholders can assess performance, particularly the return on assets index, with the aid of this analysis. Net premium written divided by gross premium written is the reinsurance retention ratio.

It is an approximate indicator of the percentage of risk that an insurer bears instead of transferring to reinsurers. Its use as a measure of risk carried assumes that the premium is proportionate to risk, which is a reasonable but imprecise assumption. In addition to covering risk, insurers and reinsurers have different costs that must be covered by premiums.

What it measures directly is the portion of the premium that is retained rather than passed on. The premium is in line with the level of risk. Although not precise, this is a valid assumption. Aside from risk coverage, insurers and reinsurers have different expenses that must be compensated by premiums.

The net amount of risk or responsibility resulting from one or more insurance policies that a ceding firm keeps after reinsuring the remaining risk or liability is known as underlying retention. The ceding company's evaluation of the risks associated with keeping a portion of the policy obligation and the insurance policy's profitability will determine the extent of underlying retention. An insurer can avoid paying the reinsurance premium by using underlying retention.

In general, the insurer will reinsure less profitable, higher-risk policies while keeping the most profitable policies or their lowest-risk components. Reinsurance, sometimes referred to as insurance for insurers or stop-loss insurance, is the process by which insurers contractually transfer sections of risk portfolios to other parties to lessen the possibility that they may have to pay a sizable obligation because of an insurance claim.

By retrieving part or all the money paid to claimants, reinsurance enables insurers to stay solvent. Reinsurance provides disaster protection against significant or

numerous losses and lowers net liability on individual risks. Additionally, it gives ceding companies the ability to raise the quantity and size of risks they can underwrite.

Reinsurance provides the insurer with more security for its equity and solvency as well as more stable outcomes in the case of exceptional and significant events by protecting the insurer against cumulative individual commitments. Without unnecessarily increasing administrative expenses to maintain their solvency margins, insurers can underwrite policies that cover a greater number or volume of risks.

Furthermore, reinsurance provides insurers with significant liquid assets in the event of extraordinary losses. Net premiums written divided by policyholders' surplus is the premium-to-surplus ratio. This ratio assesses an insurance company's ability to underwrite.

The ratio of an insurer's gross premiums written less reinsurance given to its policyholders' excess is known as surplus. Net premiums written divided by policyholder excess is the premium-to-surplus ratio. The difference between an insurance company's assets and liabilities is known as policyholder surplus.

An insurance company's ability to underwrite new policies is gauged by the premium-to-surplus ratio. The number of new policies that an insurance company can underwrite depending on the gap between its assets and liabilities is known as the premium to surplus ratio. It shows how liquid the company's finances are. It is stated as a percentage.

The amount of costs related to underwriting activity is gauged by the expense ratio. It is the ratio of earned premiums (net of reinsurance) to net operating expenses. Before any reinsurance reductions are made, this is the total premium that an insurer wrote for the reporting period.

An essential financial indicator used in the insurance sector to assess an insurance company's profitability is a loss ratio. It is computed as the ratio of earned premiums over a given time period to incurred losses (including claims paid, loss reserves, and loss adjustment charges). The ratio of issued share capital to a company's total capital is known as the issued share capital ratio.

The quantity of shares that a business has distributed to investors is known as issued share capital. This ratio is crucial for figuring out how much money a business has raised through share capital. In essence, the loss ratio and expense ratio are added to determine the combined ratio. The amount of costs related to underwriting activity is gauged by the expense ratio. It is the ratio of earned premiums (net of reinsurance) to net operating expenses. Before any reinsurance reductions are made, this is the total premium that an insurer wrote for the reporting period.

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In essence, the loss ratio and expense ratio are added to determine the combined ratio. This ratio is crucial for figuring out how much money a business has raised through share capital. In essence, the loss ratio and expense ratio are added to determine the combined ratio. The total losses suffered divided by the total insurance premiums collected are the loss ratio. The insurance company is more profitable when the ratio is lower, and vice versa. Net premiums written divided by policyholder excess is the premium-to-surplus ratio.

The difference between an insurance company's assets and liabilities is known as policyholder surplus. An insurance company's ability to underwrite new policies is gauged by the premium-to-surplus ratio.

Price level fluctuations brought on by inflation are ignored by risk ratios such the risk retention ratio, reinsurance premium to surplus ratio, reinsurance issued share capital ratio, and combined ratio, as well as performance metrics like return on assets. Many ratios ignore changes in price levels between periods because they are computed using past costs. This is not an accurate representation of the financial condition.

Comparing financial data from various time periods is known as the "time problem." By normalizing the data over time, ratios facilitate fair comparisons between various time periods. Inaccurate calculations could have serious repercussions for the reinsurer, including inadequate premiums and/or excessive obligations. One common method of financial analysis is ratio analysis. Financial statement data is extracted and visualized using it. It focuses on numbers that show a company's profitability, efficiency, finance leverage, and other important details. Both horizontal and vertical analyses can be performed using ratios.

Nigeria Reinsurance Corporation and financial analysts should be aware of the numerous issues with calculating risk retention ratio analysis, despite the fact that it is a widely used method of analysis.

For insurers, reinsurance is essential to risk mitigation. It offers access to knowledge, enhanced underwriting capacity, financial stability, and disaster protection. In an uncertain world, insurers can successfully manage risk and protect their financial health by carefully choosing the right reinsurance solutions (Oladunni and Okonkwo, 2022; Majka 2024).

Inadequate historical data is one of the most significant issues with risk retention ratio analysis computation. The data utilized in the analysis is derived from actual historical results that the business has made public. As a result, future business performance is not always represented by ratio analysis measures. The impacts of inflation present another difficulty. There are time intervals between financial statement releases because they are made on a regular basis.

The financial statements do not show real value if there has been inflation between periods. As a result, unless inflation is considered, the figures from various time periods cannot be compared. Calculating risk retention ratios was further hampered by changes in accounting regulations. Reporting may be greatly impacted if the business has altered its accounting policies and practices.

The primary financial measures used in ratio analysis are changed in this instance, and the financial outcomes obtained following the modifications are not comparable to those obtained prior to the modifications. It is the analyst's responsibility to stay informed about modifications to accounting rules. Modifications are often contained in the financial statements section's notes.

At the Nigeria Reinsurance Corporation, operational changes are an inevitable occurrence. A company's operating structure can be drastically altered, affecting everything from the product they offer to their supply chain strategy. Comparing financial measurements before and after major operational changes can result in inaccurate judgments about the performance and future prospects of the business.

Seasonal influences are another problem. Seasonal elements that may cause issues with ratio analysis should be recognized by an analyst. False interpretations of the analysis's findings could emerge from the ratio analysis's incapacity to account for seasonality effects. Financial statement manipulation is another issue with calculating risk retention ratios.

The information provided by the corporation in its financial statements serves as the foundation for ratio analysis. The management of the company may falsify this data in order to present a better outcome than its real performance. Because basic analysis is unable to detect information distortion, ratio analysis may not adequately reflect the true nature of the firm.

Before drawing any conclusions, an analyst should always conduct thorough due diligence and be aware of these potential manipulations. In order for primary insurers to reliably underwrite risks and efficiently manage potential losses, reinsurance is essential to maintaining an ideal premium surplus ratio (Jansen, Nguyen, and Shams, 2025).

The principal objective of this study is to analyse the influence of risk retention on the performance of the Nigeria Reinsurance Corporation in Nigeria. The specific

aim of this study is to evaluate to effects of reinsurance risk retention ratio, reinsurance premium to surplus ratio and reinsurance loss ratio on return on assets of Nigeria Reinsurance Corporation in Nigeria.

2. Literature Review

2.1 Overview of the Profile of Nigeria Reinsurance Corporation

The Nigeria Reinsurance Corporation Act No. 49 of 1977 established Nigeria Reinsurance Corporation. The Federal Republic of Nigeria's government owns the entire company, which began operations on January 1st, 1978, as Nigeria's flag reinsurer. By accepting the legal cession of all local insurance policies and writing inbound international reinsurance operations, the Corporation was created to stop the outflow of money in the form of reinsurance premiums.

In 2002, the Corporation changed its ownership structure from being entirely owned by the Federal Government to being privatized, with the government holding a portion of its shares.

The Corporation now has an authorized share capital of N7,500,000,000 at 50k apiece and an issued and fully paid-up capital of N6,000,000,000 at 50k, derived from the N1,500,000 take-off capital given by the Federal Government of Nigeria. One of our main areas of profit is Life Reassurance. Nigeria now rewrites life insurance companies based in Nigeria.

Medical referees and a consulting actuary support the life department's highly skilled and seasoned technical staff, which includes experts in a variety of sectors. Educational Endowment, Endowment Policies, Investment Linked Policies, Pure Endowment, Short Term Policies, Mortgage Protection, and Keyman Assurance are all covered by the individual plan. Joint life policies, group endowments, and group terms are all included in the group life business. Facultative and treaty covers are the underwriting capacities provided.

Nigeria-Re is in the business of taking on risks and offering its customers risk management and reinsurance services. Since its founding, the company has operated both domestically and internationally, taking on business from insurance and reinsurance firms in the Middle East, Asia, and Africa. Oil and gas, casualty, construction, real estate, and marine are examples of non-life businesses.

2.2 Conceptual Underpinnings of Reinsurance and Premium Surplus Ratio

Reinsurance is essential to the insurance sector because it gives insurers financial security and reduces risk. In essence, it is insurance for insurers, enabling them to shift some of their risk to a third party. By doing this, insurers can safeguard

themselves against significant and unforeseen losses, guaranteeing their capacity to settle claims and remain solvent.

One crucial indicator that insurers use to evaluate the stability and health of their finances is the premium surplus ratio. It calculates the link between an insurer's surplus—the excess of assets over liabilities—and premiums. While a low ratio could point to possible financial issues, a high premium surplus ratio shows that an insurer is in a healthy financial position.

For insurers to maintain a healthy premium surplus ratio, reinsurance is essential. Insurers can lessen the possible impact of significant losses on their surplus by shifting some of their risk to reinsurers. As a result, they are able to show policyholders, regulators, and rating agencies that they are financially strong by maintaining a greater premium surplus ratio (Mitra, Seo, and Xu, 2024).

Insurers can choose from a variety of reinsurance arrangements, each with pros and cons of their own. Treaty reinsurance, facultative reinsurance, non-proportional reinsurance, and proportional reinsurance are a few popular choices. Sharing premiums and losses with the reinsurer in a defined ratio is known as proportional reinsurance.

With this structure, insurers can transfer some of their risk while keeping a proportionate percentage of the losses and premiums. Conversely, non-proportional reinsurance covers losses that are above a specific attachment point or threshold. To protect their excess in the case of catastrophic losses, insurers pay a premium to the reinsurer for this coverage. Individual high-value or complex risks are usually covered by facultative reinsurance.

For insurers to customize the reinsurance arrangement to risks, it entails negotiating reinsurance coverage on a case-by-case basis. In contrast, treaty reinsurance covers a certain portfolio of risks for a predetermined amount of time. This kind of reinsurance enables insurers to shift a wide range of risks to the reinsurer and is frequently utilized for more common hazards.

The insurer's risk tolerance, portfolio composition, and financial objectives all play a role in selecting the best reinsurance solution. The advantages and disadvantages of each alternative must be carefully considered by insurers, considering elements like cost, coverage, and any effects on the premium surplus ratio (Faghanizadeh, Askari, and Partovi, 2024).

For insurers to maintain a healthy premium surplus ratio, reinsurance is essential. Insurers can show their financial stability and safeguard their excess by shifting some of their risk to reinsurers. Choosing the best reinsurance option requires considering a number of variables and coordinating the decision with the insurer's financial objectives and risk tolerance.

In the field of reinsurance, the premium surplus ratio is an important statistic. It is a gauge of an insurance company's strength and financial stability that shows its capacity to withstand unforeseen losses. The premium surplus ratio, to put it simply, shows the link between an insurer's net premiums written (premiums received less reinsurance expenses) and its surplus (the excess of assets over liabilities).

The premium surplus ratio is significant because it aids reinsurers and insurers in determining if their surplus is sufficient to maintain their underwriting operations. While a smaller ratio could point to possible financial hazards, a greater ratio denotes a stronger financial situation. It acts as a standard by which rating agencies and regulators assess insurance companies' risk management and solvency.

A favorable premium surplus ratio may result in higher stakeholder confidence and better credit ratings. Because reinsurers take on a large amount of the risk from primary insurers, the premium surplus ratio is especially important. Reinsurers can take losses without endangering their financial stability when the ratio is healthy (Nugraha and Ariefianto, 2024; Hasan, Beshkooh, and Nikkhah, 2025).

2.3 The Impact of Reinsurance Risk Retention on the Premium Surplus Ratio

Because it enables insurance firms to shift some of their risk to a reinsurer, reinsurance is essential to the insurance sector. In the event of a significant claim or disaster, this risk transfer aids insurance firms in preserving a steady financial position and safeguarding their clients. The premium surplus ratio, which shows the company's capacity to pay claims and expenses with the premiums collected, is one of the primary indicators used to assess the efficacy of reinsurance.

Because it affects both the denominator (premiums) and the numerator (surplus), reinsurance directly influences the premium surplus ratio. By shifting some of the risk to a reinsurer, reinsurance enables insurance firms to increase their surplus. By doing this, the insurance company improves its surplus position by lowering its possible exposure to significant losses. Insurance firms benefit from this surplus augmentation since it has a beneficial impact on the premium surplus ratio.

By lowering the amount of premiums that the insurance company keeps, reinsurance also has an impact on the denominator of the premium surplus ratio. A percentage of the premiums earned are given to the reinsurer when an insurance company reinsures a portion of its risk. This decrease in retained premiums may influence the company's financial stability by lowering the premium surplus ratio (Ezeife, Eyeregba, Mokogwu, and Olorunyomi, 2024).

Insurance firms can manage their premium surplus ratio while taking reinsurance into account in several ways. A conservative reinsurance strategy is chosen by some insurance companies, which reinsure a sizable amount of their risk. This strategy

lowers the company's risk of suffering significant losses, but it also lowers retained premiums, which may influence the premium surplus ratio.

Nonetheless, the improved surplus position ensures the company's financial stability by acting as a buffer against unfavorable circumstances. Others favor a reinsurance strategy that strikes a balance between risk transfer and retention. With this strategy, the insurance firm can give up some risk to the reinsurer while keeping a fair amount of it. By finding this equilibrium, the business hopes to preserve a steady premium surplus ratio while still reaping the benefits of reinsurance surplus augmentation.

Conversely, some insurance companies could choose for a risk retention strategy, in which they keep a sizable amount of the risk without significantly depending on reinsurance. By optimizing retained premiums, this strategy improves the premium surplus ratio. But it also puts the business at more risk, which might put its financial stability in danger in the event of significant losses.

A balanced reinsurance strategy is frequently the best choice for insurance firms when considering the many viewpoints and possibilities. With this strategy, they may maintain a steady premium surplus ratio while taking advantage of the surplus augmentation offered by reinsurance. The business can maintain its financial stability and guarantee a sufficient level of retained premiums by keeping a fair proportion of risk.

Achieving this equilibrium is essential for efficiently controlling the premium excess ratio. Reinsurance has a significant impact on insurance firms' premium surplus ratio. By shifting risk to reinsurers and affecting the amount of premiums retained, it enhances surplus. While there are several ways for insurance firms to control their premium surplus ratio, a balanced reinsurance strategy is frequently the best option. Insurance companies can benefit from the protective aspect of reinsurance while maintaining financial stability by finding a balance between risk transfer and retention.

In the insurance business, reinsurance is essential, particularly for risk management and financial stability. Reinsurance is particularly useful when it comes to increasing the premium surplus ratio. An insurance company's capacity to pay claims and costs with the premiums it receives is gauged by the premium surplus ratio. While a smaller ratio raises the possibility of financial instability, a higher ratio denotes a stronger financial position.

This section will examine several ways that reinsurance might help improve the premium surplus ratio, evaluating various choices and providing insights from diverse angles. The potential of reinsurance to reduce catastrophic risks is one of its biggest advantages. Natural catastrophes and major accidents are examples of catastrophic events that might cause a spike in claims that may be too much for an insurance company to handle.

An insurance firm can make sure it has the funds to pay claims by shifting some of these risks to a reinsurer, which will increase its premium surplus ratio. Take an insurance business that underwrites policies for properties in an earthquake-prone area, for instance. The insurance company can reduce its exposure to potentially catastrophic losses and maintain a better premium surplus ratio by reinsuring a portion of the earthquake risk.

Additionally, reinsurance helps insurance companies reach a wider market and improve their underwriting capability. Insurance firms can release funds that would otherwise be locked up in reserves to cover prospective losses by assigning some of their risks to reinsurers.

Insurance companies can issue more policies and earn more premiums because of this expanded underwriting capacity, which eventually improves their premium surplus ratio. Furthermore, reinsurers frequently have a wider global reach and specialized knowledge in particular industries, which allows insurance companies to access new markets or provide coverage for risks they might not be able to manage independently. The premium surplus ratio may be further improved by this strategic alliance with reinsurers. Insurers have several options when it comes to reinsurance, each with associated costs.

To maximize their cost effectiveness and raise the premium surplus ratio, insurance companies must assess various reinsurance plans and arrangements. The retention level (the amount of risk an insurer maintains on its books), the kind of reinsurance coverage (proportional or non-proportional), and the conditions and prices that reinsurers give are all considered in this evaluation.

An insurance company might, for example, compare the costs of a non-proportional excess-of-loss arrangement, in which the reinsurer only pays claims that surpass a predefined threshold, with a proportional treaty arrangement, in which the reinsurer shares a portion of each policy's risk and premium. Insurers can choose the most economical reinsurance plans that maximize their premium surplus ratio by closely examining these choices (Soye, Olumide, and Adeyemo, 2022).

Data analytics and cooperative risk management are becoming essential tools for both insurers and reinsurers in the current digital era. In order to improve their premium surplus ratio, insurers can better understand their risk exposures, pinpoint possible areas for improvement, and make well-informed decisions by utilizing data and sophisticated analytics.

By sharing their knowledge and insights, reinsurers can also contribute significantly to this process by assisting insurers in recognizing new risks and putting into practice efficient risk management techniques. Insurance companies can enhance their underwriting procedures, pricing strategies, and claims handling procedures by

promoting a cooperative approach to risk management and employing data analytics. This will ultimately result in a more advantageous premium surplus ratio.

For insurance firms, reinsurance is essential to raising the premium surplus ratio. Insurers may improve their financial position and guarantee long-term sustainability by reducing catastrophic risks, increasing underwriting capacity, optimizing reinsurance programs for cost effectiveness, and embracing collaborative risk management and data analytics. This section's examples and insights demonstrate the various advantages of reinsurance in raising the premium surplus ratio, highlighting its crucial function in the insurance sector (Romanosky, Dixon, Willis and Brigs, 2025).

2.4 Overview of Reinsurance Loss Ratio

The ratio of reinsurance claims (losses) to earned premiums is known as the reinsurance loss ratio. The sum of money that the insurer charges or that the insured pays to obtain the insurance's services is known as earned premium income (Polontoh, 2024). Underwriters use a technique called risk assessment to determine a reasonable cost for an insured to pay as a premium.

The underwriter's role is to evaluate the information on the policy form that an insurance applicant submits to the insurance company and advise the company on whether to accept the risk. According to Garba and Abdulsalam (2018) and Singreddy (2025), a premium is the amount that the insured is charged based on their estimates of risk or loss.

Premium income is the term used in investing to describe money received from the sale of an option. The buyer of an option pays the writer a premium to have the right (but not the responsibility) to exercise the option at a predetermined price and date; the writer receives premium revenue. In the insurance industry, an insurer's earnings come from premiums that clients pay for insurance products. The premium is the amount that a consumer must pay for a given period when purchasing an insurance product, such as a health insurance policy.

The price that the buyer of a call must pay to the seller (writer) of an options contract is known as the option's premium. When the underlying stock is owned, investors can make money by writing covered options contracts; if not, they can write naked options. The option writer makes the whole premium amount if the option expires without being exercised. The money received by an insurance firm from premiums paid by clients is known as premium income.

All insurance products, including house, vehicle, and health insurance, have premiums. The price paid for coverage under the policy for a specific amount of time is called a premium. Other revenue streams, such investment income, are not

included. In general, premiums must be recorded by insurers as revenue in proportion to the quantity of insurance that is offered.

Because earned premiums are practically the only part of an insurance company's premiums that can be recognized as income—unearned premiums cannot—earned premiums are crucial. This is because the risk for the remaining portion of the insurance policy is still borne by the insurer.

When policyholders approach an insurer, the corporation agrees to pay them money if a certain event occurs within a predetermined time frame in exchange for premium payments (Saleh, 2025). An official request made by a client to an insurance provider for reimbursement for the loss of the risk covered is known as an insurance claim.

Situations resulting from loss incidents frequently alert the covered population to the necessity of preventative measures. But according to Skaf, Eid, Thrassou, Nemar, and Rebeiz (2024), claims are identified as the most important channels and have a defining connection that impacts the customers' entire view of their insurer. The insurers' quest to improve client acquisition, expectations, retention, and business insight for product innovation and the company's profitability is made possible by claims processing, which serves as a mirror to the consumer.

Consequently, cost control, risk management, and achieving expectations required for appropriate portfolio underwriting depend on the motivation, accuracy, efficiency, and efficacy of claims management systems (Maggioni and Turchetti, 2024).

The revenue from premiums must be enough to pay for underwriting and claims. Failure to adhere to this fundamental insurance philosophy could cause an insurer to postpone or struggle to pay claims, which could harm the company's reputation. The insurance company's income is negatively impacted by nonpayment of claims since it lowers policyholder confidence and makes it harder to draw in new subscribers.

According to Rodriguez, Aguilar, Delgado, Santa Cruz, Benavides, Salazar, and Suyón (2024), claims from prior years typically arise in subsequent years, making the insurance industry tough and achieving profitability extremely difficult.

Premium income is one of the main sources of income for an insurance firm, and it is typically more stable than other sources. The company's profitability and efficiency are strongly favorably impacted by the amount of gross premiums it collects, or, to put it another way, the size of its operations.

According to Zhang and Peng (2025), this could mean that the expansion of medium-sized businesses boosts both the overall net profitability of the business and the profitability of its core insurance operations. Younis, Salem, Alsanea, Elemam,

and Abaker (2025) discovered a significant relationship between the rise in written premiums and the financial performance of insurers. According to Giráldez, Moreno, Perez-Calero, and Villegas' (2025) empirical findings, one of the causes of insurers' insolvency is the swift increase in premium volume.

Profits are the result of business operations over a specific period. The income or profit covered in this study is the net profit from the company's operations or services because of its assets. Bardadym (2024) defines net profit as the amount of money that remains after deducting all direct expenses, including taxes. The amount of money participants pays (premium) funds risk management and fees for managers (companies) in exchange for their efforts to manage participants' risks.

The risk management division handled claims, form allowances, and reinsurance expenses. Meanwhile, the company funded its activities with the fee portion (Ananda, Fajriansyah, Annisa, Novita, and Dewi, 2024). Studies by Wahyuddin and Mauliyana (2021) and Faghanizadeh, Askari, and Partovi (2024) found that premium income had a major effect on earnings.

However, Yusra's (2024) analysis found no appreciable effect of premium income on profitability. The gross premium growth rate is the percentage change in gross written premium from one period to the next.

The net premium includes all written premiums, including some that may not have been earned during the reporting period. To reduce its own risk, the insurer may decide to reinsure the contracts with a reinsurer in some circumstances. In these circumstances, the reinsurance premium that is paid out is reduced by the policyholder's earned premiums.

The policyholder's insurance benefits and premium payments determine how much the insurance company will pay the insured (customer) under the terms of the policy. The success of an insurance transaction depends on how a claim is handled. One of the primary duties of an insurance business is to settle disputes. What drives individuals and companies to purchase insurance is the fear of a future claim.

Therefore, one could contend that an insurance company's main responsibility is to resolve claims. To lessen such risks, the industry provides services to the public. Gianfredi, Nucci, Pennisi, Maggi, Veronese, and Soysal (2025) assert that insurance is crucial because it shields individuals or organizations from the loss of revenue that would be used for items like health, longevity, education, and recovery.

Insurance companies use these to market policies, or promises, to consumers. It guarantees to reimburse or return a policyholder to his pre-loss financial situation. Therefore, an insurance policy is a commitment made by the insurer to the policyholder to cover future claims in exchange for an upfront premium. The main goal of insurance is to pay claims. The amount due to the beneficiary, nominee, or

legal heir of the insured at the policy's maturity or upon the insured's death is known as the claim amount.

Every time a claim is made by the policyholder or his beneficiary based on the terms of the policy statement, the insurance company reviews the claim to determine its validity and make sure it is not false in accordance with the standards. The necessary sum is paid out in the name of the relevant beneficiary, nominee, or legal heir when the claim's legality has been confirmed. This sum is referred to as the life insurance policy's claim amount (Arantik and Sativa, 2025).

Underestimated liabilities from unpaid (expired) past policies or underpriced current business, improper underwriting, incorrect or inaccurate assumptions on the frequency and severity of losses, or factors completely outside the underwriter's control can all have an impact on an insurer's total claims.

Furthermore, a significant portion of the total written premiums might be uncollectible after being outstanding for extended periods of time (Marshall, 2024).

The ratio of claims to premiums, or loss ratio, is a crucial measure of whether a property and casualty insurer's pricing policy is appropriate. It also indicates the quality of business underwritten and partially represents underwriting performance. The loss ratio is crucial to an insurer's long-term profitability since it is at the core of its major claims management initiatives (Zopounidis and Lemonakis, 2024).

A claim is the amount of coverage that a participant receives for the risks they have encountered. Payment for claims is provided by the manager in accordance with the terms of the policy, as agreed upon in the policy, and the findings of a risk inquiry. Claim payments in Sharia insurance businesses are an insurance or underwriting expense deducted from participant funds rather than the manager's duty.

This discrepancy results from Sharia insurance companies' use of risk sharing and the idea of tabarru' funds. Following the claim assessment procedure, the claim is acknowledged as a burden in the amount chosen to compensate the participant (Sim, McNeilage, Rebbeck, and Ashton-James, 2025).

According to the findings of studies conducted by Safiu and Shomuyiwa (2024), Oladunni and Olaolu (2024), and Faghanizadeh, Askari, and Partovi (2024), claims significantly impact profit. However, according to studies by Safiu and Shomuyiwa (2024) and Faghanizadeh, Askari, and Partovi (2024), the claim had no appreciable impact on profit. The percentage change in net earned premium from one period to the next is known as the net premium growth rate.

The gross premium is the amount received from the sale of an insurance policy that attempts to reduce the insured's risk over the course of the coverage period (Fadun,

2023a; 2023b; Fadun and Silwimb, 2023a; 2023b). Reinsurance acquisition considerably increases insurers' premium income, according to Mesyef (2024).

Additionally, it is shown that the income from non-life insurance is positively correlated with fluctuations in reinsurance usage. Premium income affects profitability since any increase in insurance premiums will result in higher profits (Yusra, 2024).

Income taxes are paid by both individuals and businesses, and reducing the effective tax rate on income may encourage people to get insurance at any premium rate (Banthin, Buettgens, Simpson, and Levitis, 2024).

Furthermore, if premium income is not subject to taxes, policyholders may pay less for insurance policies. Reduced rates for individuals and organizations may promote investment in insurance coverage, promoting financial stability and resilience in the face of unanticipated events (Marangwanda, 2025).

Chang (2024) asserts that reinsurance increases insurers' revenue by lowering the volatility of financial statements, especially income statements. Additionally, reinsurance lowers direct insurers' risk of bankruptcy or insolvency (Cremer, Sheehan, Mullins, Fortmann, Materne and Murphy, 2024). This risk may rise if the business takes on more capital risk.

Reinsurance can help reduce this risk, though, if it is used appropriately. To sustain premium growth rates, insurers use alternative reinsurance facilities, particularly for risks with significant potential losses (Cremer, Sheehan, Mullins, Fortmann, Materne, and Murphy, 2024).

However, the bulk of insurance companies relied extensively on borrowing and reinsurance to increase underwriting capacity and stabilize profit, according to Lokhande, Ansari, Hassan, Sanusi, and Nobanee (2024). However, this heavy reliance puts them at risk of insolvency.

Romanosky, Dixon, Willis, and Briggs (2025) claim that giving up premium income to reinsurers improves the financial stability of non-life insurance companies by reducing the possible impact of significant and catastrophic losses. Reinsurers are required to help the primary ceding firm financially and share the cost of claims payments when premium income is ceded to them. As a result, the insurer's capital reserves will be less affected by claims payments.

According to Shi, Landriault, and Liu (2024), an insurer's reliance on its reinsurers and a general awareness of possible exposure to reinsurance collectability issues are indicated by the ratio of reinsurance ceded premium to premium income. According to Khoualed, Bouzerb, and Almi (2025), a large reinsurance ceded value suggests that the business is actively offering reinsurance.

According to Gülveren (2024), insurance companies can better manage their risk portfolios by surrendering premiums to reinsurers. By transferring a portion of their risk exposure to reinsurers, insurers can diversify their risk and reduce concentration in specific business lines or geographic locations. This variety can enhance insurance companies' overall risk management system and reduce their sensitivity to large losses (Gupta, Bansal, Sharma, and Grima, 2024).

According to Banerjee and Guha Deb (2024), efficient use of businesses' resources indicates successful and efficient management, which will help the economy and insurance. Chang (2024) asserts that insurance companies that acquire more reinsurance coverages produce more stable financial results, leading to greater income from risk-adjusted premiums.

A subject that is infrequently covered in insurance literature is reinsurance premium accepted. It is included in the gross premium income or gross premium written for the insurer. A coinsurance agreement is the accepted reinsurance premium. It describes the percentage of premiums that an insurer gets from another insurance provider in exchange for assuming some of the risk associated with the insurance policies that the insurer writes. Stated differently, it stands for the premium revenue that the insurer receives in return for offering insurance coverage to another insurance company.

According to Wang, Siu, and Fan (2024), as their reinsurance portfolio expands, primary insurers are more inclined to provide reinsurance to other businesses. Insurance firms can take more risks by accepting premiums through reinsurance agreements. As a result, it enables responsive insurers to function with confidence in a new sector of their business and enhances the reputation of insurance companies as the market grows (Singhal, Goyal, and Singhal, 2024).

Reinsurance is a risk management strategy that helps insurance companies lower their capital needs and protect themselves from higher claim payouts, according to Marangwanda (2025). This could be accomplished by ceding a portion of its premium to a reinsurer in order to create a reinsurance arrangement and taking on a specific percentage of the risks of another insurance company through accepted reinsurance premiums (Maggioni and Turchetti, 2024).

According to Abass (2025), insurance companies must forecast the future before taking on risks because the sector functions on an inverse cycle (Kabir, and Sharan, 2024). Insurance companies should exercise caution when taking on or accepting a larger percentage of risks, though, as the accepted premiums could not be sufficient to cover the required payout, leading to financial loss.

The percentage of the company's shareholders' equity that is being used to cover reinsurance commissions is shown by the ratio of reinsurance commission to shareholders' equity. A greater ratio may signal that a significant percentage of the

company's equity is being allocated to meet reinsurance expenses, which could undermine the financial health and stability of the organization. Insurance companies can afford it more when reinsurance costs drop, which results in higher capacity, pricing competition, and eventually larger losses and combined ratios (Wang, Hua, Liu, Lu, Zhang, Liu, and Szolnoki, 2025).

According to Li, Chiu, Lin, and Xie (2024), a successful reinsurance contract lowers the capital required for the risk the cedant takes by removing risk from the primary insurer's balance sheet. The percentages that each insurer keeps are known as reinsurance or ceding commissions, and reinsurance companies and cedants may split the costs and earnings from offering reinsurance coverage.

According to Soye, Olumide and Adeyemo (2022) the temporary relief of excess also increases equally with the cedant commission to investors' equity ratio. However, because they might have an impact on the company's premium income and financial stability, insurers must carefully assess administrative costs, reinsurance commissions, and other expenses (Zakaria, Shmsuddin, and Harun, 2025).

2.5 Concept of Return on Assets (ROA)

Return on assets (ROA) is a profitability metric that may be used to assess an insurance company's ability to make money while still meeting its policyholder responsibilities. Metrics for return on investment have been employed in past studies (Phoung, 2025; Nguyo and Anene, 2024). Njagi, Maina, and Kiai (2025) claimed that ROA is still a crucial indicator of business performance and that insurance businesses must make a profit to compete successfully in both domestic and foreign markets (Msomi, 2024; Tutcu, Kayakuş, Terzioğlu, Uyar, Talaş, and Yetiz, 2024).

One of the profitability metrics used as a broad gauge of a company's overall financial health during a specific time is return on assets (ROA). Most of the time, profitability is used as a generic phrase that includes efficiency and production.

Profitability is a very broad term that can be used to characterize the level of success a company has achieved over a specific time frame. To put it another way, profitability is a qualitative and quantitative account of how an individual, a group, or an entity that is working has been able to attain the goal that is associated with that effort.

A company's net income is divided by the average of its total assets to determine ROA. After that, a percentage is used to express it (Suciu, Păun and Duma, 2021).

According to Singh, Gupta, and Chaudhary (2024), ROA is the net profits represented as a proportion of total assets. It shows the effectiveness of asset

management and shows the profit made per unit of assets. Since ROA focuses on the profit made from assets, it is frequently employed as a gauge of the proficiency and operational effectiveness of banks.

Due to its direct correlation with profitability, ROA is a crucial performance metric. Moreover, ROA is a more accurate indicator of the company's capacity to produce returns on its asset portfolio and is unaffected by high equity multipliers (Wati, Violinda, and Amelia, 2024; Majka, 2024).

Insurance firms are crucial for both individuals and corporations because they direct cash and compensate for losses by returning the parties to their pre-loss positions. When the general investment climate is stable, this company plan may be feasible. However, insurance businesses may find themselves in a difficult situation where they are squeezed from both underwriting profit and investment profit when the investing environment becomes extremely unstable.

The interests of shareholders suffer when a company's profit model fails. In more dire situations, the business may struggle to make its loan payments. In order to return to previous levels of profitability in a changing environment, it is therefore necessary to consider the underlying mechanism of value creation once more, and general guidelines like maximizing market share often become inapplicable when circumstances change (Salter, 2024; Chao and Xiao, 2024).

A key measure of an insurance company's capacity to produce returns on its cash and investment assets is profitability (Islam, 2025). It is essential to a business's viability, expansion, and appeal to investors. An insurance firm cannot maintain operations or accomplish its objectives without adequate money. One of the most important financial indicators of success is still the capacity to turn a profit after deducting costs.

Monitoring profitability is crucial for forecasting future financial performance as well as evaluating present financial performance. Islam (2025) asserts that a profitability analysis reveals information about a company's capacity to raise capital, manage working capital, keep overhead costs under control, and make efficient use of its assets. It is the first stage in assessing an insurance company's creditworthiness and financial stability. The ROA in the insurance sector has been thoroughly studied in the past, and our research adheres to this well-established line of investigation.

Profitability is the capacity of an investment to generate a return from its use, according to Alshehadeh, Elrefae, Qirem, Hatamleh, and Alkhawaja (2024). The ability of an organization to make money is what makes it profitable; the inability to do so results in a loss. He goes on to say that if the revenue is higher than the cost of the inputs, that is just profitability; if the revenue is lower than the cost of the inputs, it indicates subpar performance.

When the revenue from a commercial activity surpasses the costs, expenses, and taxes required to maintain the activity, a financial benefit is realized. Since maximizing the owner's wealth is one of financial management's goals and profitability is a key factor in determining performance, Masithoh (2024) claims that profitability is one of the most significant goals of financial management.

Profitability is a metric used to assess a company's overall effectiveness. Input-output analysis may be the most effective method for assessing business efficiency. Profitability can be calculated by comparing output to input as a percentage or by comparing it to the outcomes of other businesses operating in the same sector or at different times. A company's profitability can be assessed by contrasting the amount of capital used (input) with the revenue generated (output).

This is commonly referred to as return on capital employed or return on investment. According to Reschiwati and Solikhah (2018) and Attaullah, Manik, Chandritike, and Yuniarti (2025), an insurance company is considered profitable if its revenue exceeds its expenses.

The overall efficiency of the company can be determined by looking at profitability ratios. It is typically used to gauge the company's earnings during a given time period based on sales, assets, capital used, net worth, and earnings per share. Profitability ratios quantify the company's earning potential and are regarded as a sign of its expansion, prosperity, and management.

Since profit is typically expressed as a percentage difference between premium income and payout, the term "profitability" refers to a relative metric (Faghanizadeh, Askari, and Partovi 2024; Banthin, Buettgens, Simpson, and Levitis, 2024).

The total effectiveness of the company is indicated by profitability ratios. According to Thien, Asif, Kweh, and Ting (2024), net premium generated, profitability from underwriting operations, annual turnover, return on investment, and return on equity are typically used to illustrate the financial profitability of insurance firms. These metrics fall into two categories: investment profitability metrics and profitability metrics (Alshehadeh, Elrefae, Qirem, Hatamleh, and Alkhawaja, 2024).

Every business, including insurance companies, wants to be profitable. It is related to an organization's improved financial situation (Fitriana and Sinarasri, 2024). The relationship between the absolute amounts of proceeds and other variables is explained by profitability. In a similar vein, Al-Ali and Al-Shabeeb (2024) claimed that an insurance company's profitability is a very important performance indicator since it offers more accurate measurements of the company's level of income and profitability. Higher-level managers view profits practically as earnings after expenses (Dawood, 2024). For other academics, return on assets (ROA) is a proxy for profitability (Grandis and Nursiam, 2024).

Several factors, broadly classified as internal, industry, and macroeconomic factors, have an impact on insurance businesses' profitability. According to Widnyana, Susilo, Suarjana, Antari, Putri, and Shafie (2024), internal factors of insurance companies' profitability include those that management can control and elements that set them apart from other businesses. As stated by Olaiya (2025).

An insurer's underwriting and investing operations may have an impact on insurance profitability. Since no business owner enters the market with a setback and loss-control mindset, making a profit is the only reason to enter the business arena. As a result, profitability is an indisputable determinant for the continuous existence of business worldwide.

According to Skevofilax (2024), a company cannot expand and fulfill some of its immediate commitments and objectives without making a profit. While profit provides additional assurance against insolvency for the insured and regulators, it is a source of growth and payouts for investors and management (Ma and Li, 2024).

According to Oladunni and Olaolu (2024), investors and insurers view profitability favorably, but policyholders of stock insurers view it as a markup, and policyholders of mutual companies view it as neutral. While it comes to solvency, insurance companies' regulatory authorities either promote profitability or attempt to lower it while setting rates.

The profitability of insurance firms has recently been compared to that of their sister industry, banking; nevertheless, for insurance companies to be as profitable as the banking sector, their underwriting procedures must be sufficiently functional (Fayzulloyevich, 2025). This suggests that, among other elements of the insurance industry, underwriting is a crucial factor. It also supports Masithoh's (2024) claim that as the main objective of financial management is to maximize the owner's wealth, profitability is seen as a crucial performance predictor.

One of the most popular ratios that shows how effective management is managing assets to generate returns is return on assets, or ROA. Net income is divided by total assets to determine ROA. When it comes to ROA, there are established industry benchmarks. One may determine a company's success by simply comparing its ROA to the benchmark ratio. When making decisions about the company, analysts, investors, and management frequently employ this ratio (Han, Wang, Che, Yang, Zhang, and Xu, 2024).

2.6 The Effects of Risk Retention Ratios on Return on Assets

The risk retention ratio, which considers operational expenses, revenue, and shareholders' equity, demonstrates how well a company generates profits over time. The greater the ratio, the better for the business since it indicates that it can consistently turn a profit. Risk retention ratios and reinsurance companies'

profitability are generally positively correlated (Dutta, 2020; Alamsyah and Othman, 2021; Lalon and Das, 2022).

The amount of money received from insurance premiums is subtracted from the total amount spent on claims and other expenses to determine profit (Mwangangi, 2020). Higher-than-expected profits indicate that the business is effectively managing the risks it encounters and making more money than it is spending on claims and other expenses (Amani and Markkonen, 2020).

Real-world studies show that financial ratios and ROA have a positive relationship. For example, Kao, Wu, Chang, Liu, Huang, Huang, and Wang (2025) found a strong association between profit ratio and competitiveness—a crucial measure of a business's profitability. Furthermore, Rajak (2024) found that the solvency of general insurance companies is positively correlated with profitability. However, a number of other elements also affect profitability (ROA), including premium revenue, investment income, operational expenses, and ratios of claims expenses (Hissiyah and Meylianingrum, 2023).

These factors demonstrate the more general relationship between financial ratios and ROA. These factors may moderate or affect the relationship between retention ratios and ROA. For example, the beneficial effects of gross premium and net premium ratios on ROA may be offset by excessive operating expenses, reinsurance costs, or claims expenses. Financial performance and non-financial performance are the two types of performance. The productivity of the business, or the effective conversion of inputs into outputs, is the first dimension.

The second is the profitability dimension, which highlights factors directly related to the financial report when a company's earnings exceed its expenses (Nguyen, 2024). Profit and ability are the two words that make up the term profitability. At this stage, it's important to distinguish between the phrases profit and profitability. From an accounting perspective, profit is calculated by subtracting all expenses incurred in generating an enterprise's total revenue, whereas profitability is defined as an investment's capacity to generate a return from its uses, as determined by ROA (Singh, Gupta, and Chaudhary, 2024).

The profits are quantified in monetary terms, according to Keynes (2024). It is, in essence, the gap between income and expenses. These two variables—revenue and expense—are impacted by macroeconomic variables, industry characteristics, and firm-specific traits. Profit is essential to the survival of most business organizations and a necessary condition for a firm operating in a market to become more competitive since it generates dividends and gives investors and management extra protection against insolvency.

Since increasing shareholder value is one of the primary jobs and goals of financial management, profitability is one of the most crucial aims. Murtiningrum and

Wahyuningsih (2024) state that components of financial ratios (losses and expenses, which are influenced by product pricing, risk selection, claims management, marketing and administrative expenses, investment performance, which is a function of asset allocation and asset management as well as asset leverage) are the first factors that determine ROA.

Premium income and investment income are the two aspects of an insurance company's profitability that need to be considered. Any money received from the issuance of insurance policies is referred to as premium income. Investment income is the second aspect of profitability. In other words, investments account for a larger share of an insurer's revenue.

In general, a company's profitability can be used to gauge its performance. "Profitability" refers to a relative metric in which profit is stated as a ratio, typically as a percentage. According to Sudacevschi and Stefan Duicu (2024), a profitability ratio is a set of financial measures used to evaluate a company's capacity to produce profits in relation to its expenses and other pertinent charges incurred during a given time period. Several ratios for measuring profitability were agreed upon by Machmud, Tijjang, Latif, Hermawan, and Salehe (2024).

These consist of Return on Invested Capital (ROIC), Return on Equity (ROE), and Return on Assets (ROA). A company's profitability in relation to its total assets is shown by its return on assets (ROA). It demonstrates how well management makes use of its resources to produce profits. Nonetheless, ROA is the primary measure of a company's profitability, according to most scholars studying insurance and its profitability.

Boadi and Li (2013) define profitability as return on assets (ROA). Because it gauges how effectively a business manages its asset investment and uses it to produce profit, the Return on Assets ratio is a crucial indicator of profitability. It calculates the profit margin in relation to the firm's total asset investment. The asset management category is connected to the return on assets ratio.

The higher the percentage, the better the profitability since it indicates that the business is making good use of its resources to produce revenue. According to Singh, Gupta, and Chaudhary's (2024) analysis, return on assets (ROA) indicates to investors how successfully a business uses its assets to generate income; it is a crucial measure of the company's overall productivity and represents the percentage of profit the business makes from its entire assets.

Return on assets (ROA) reflects the percentage of profit a company earns to its total assets. ROA provides insight into how well management uses its resources. ROA is therefore regarded as an indicator of efficiency (Daya, 2025). A corporation that has a high return on assets (ROA) is good at converting assets into profit.

According to Deari, Kukeli, Barbuta-Misu, and Virlanuta (2024), ROA is typically regarded as a stable financial performance ratio. A rising ROA indicates that a company is more profitable, whereas a falling ROA indicates that a company is less profitable. Net income is divided by total assets to get ROA. As shown in an organization's financial statement, total assets are the sum of current and non-current assets.

3. Theoretical Framework

This study is guided by three theories: Corporate Demand Theory, Optimal Reinsurance Theory (ORT) and Hawley's Risk Theory of Profit.

3.1 Corporate Demand Theory

According to Twaamb (2024), this theory explains why a primary insurer wants to buy reinsurance coverage against the risks it has taken on. Risk sharing is the primary motivation for requesting insurance or reinsurance coverage; however, research has shown that this is not the only justification for reinsurance adoption (Cremer, Sheehan, Mullins, Fortmann, Materne, and Murphy, 2024).

In order to reduce the likelihood that these businesses would be destroyed, it is necessary to diversify the risks in a company's underwriting portfolio by utilizing reinsurance companies' competence in stabilizing shareholders' returns (Horvey and Odei-Mensah, 2025). The main insurers frequently have a significant degree of increased volatility in their level of cash flow because of their business situation, which is considered when it comes to risk management and its coverage.

The theory is therefore pertinent to the study since a reinsurance arrangement is required to remove the risks of insolvency and further lower the cost of anticipated bankruptcy (Ghazalat and AlHallaq, 2024).

3.2 Optimal Reinsurance Theory (ORT)

Borch (1960) and Arrow (1963) proposed ORT. Because reinsurance premiums incur additional costs for an insurer, ORT suggests the optimal way to use reinsurance agreements (Bernard, 2024). Essentially, the cost of the reinsurance premium increases with the estimated risk transferred to the reinsurer and vice versa. Wang, Siu, and Fan (2024) classify the ORT model into three groups.

From the perspective of the insurer, the first group considers ideal requirements (Cheung, Yam, Yuen, and Zhang, 2025). Reinsurance contracts with a continuum of types should be designed optimally under adverse selection. The second group examines optimal reinsurance theory from the perspective of the reinsurer (Yao and Zhu, 2024).

According to Frees, Butt, and Shi (2025), the third group incorporates certain popular reinsurance schemes with ideal characteristics including excess of loss and quota shares. Panham, Louzada, and Ramos (2024) describe the process of providing insurers with the best plans and solutions.

The premises of Guan, Liang, and Xia (2024) are as follows: the insurance market is made up of one insurer and one reinsurer; the reinsurer establishes its own pricing rule, which may be based on its own cost of capital; the insurer has complete knowledge of the reinsurance pricing rule; and both the insurer and the reinsurer have access to the same data regarding the underlying loss distribution. The insurer chooses the reinsurance coverage in an effort to strike the best possible balance between the cost reduction and the expense of transferring such variation to the reinsurer (Lin, Liu, Liu, and Yu, 2025).

3.3 Hawley's Risk Theory of Profit

F.B. Hawley presented the risk theory of profit in 1893. *"Profit is the reward of risk taking in a business,"* according to Hawley. All other components of production, such as land, labor, and capital, have guaranteed revenues from the entrepreneur during any commercial activity. Whether the business owner makes money or loses it doesn't really matter to them. Profit, according to Hawley, is a reward for taking chances. He asserts that the projected profit increases with risk.

The firm faces risks for several reasons, including the unavailability of essential raw materials, the development of superior alternatives by rivals, the obsolescence of a technology, a decline in market prices, and natural and man-made disasters. Business risks are unavoidable and unpredictable. Hawley asserts that taking chances rewards an entrepreneur. One argument against this view is that profits come from superior entrepreneurs' ability to lower risks rather than from risks being taken. The only reason for the earnings is the entrepreneurs' improved oversight and management.

The fact that revenues are never commensurate with the risk incurred is another point of contention. Businesses with low risks may make more money, while those with significant risks may make less. Since accepting risks is a crucial part of an insurance company's operations, this idea is pertinent to the research.

Because taking risks is a laborious process, the corporation exposes its business to risk in exchange for a reward in the form of profit. If an insurance firm just receives a standard return, it is certain that it will not want to take on risks. Risk-taking must therefore yield a greater payoff than the risk's true value.

Additionally, it has been stated that the predicted profit rate increases with company risk. "A company's profit rate increases with industry risk." Therefore, the insurance company's ROA will increase with better retention ratios.

4. Empirical Review and Hypothesis Development

Msomi (2024) investigated the relationship between South African publicly traded general insurance companies' overall profitability and underwriting profit determinants. A sample of 36 insurers was examined in the study, considering their definable markets and readily available financial data from 2008 to 2019. The study investigated the relationships between different financial indicators and Return on Assets (ROA) using signal correlation analysis.

With correlation coefficients of –0.4500, –0.3365, and –0.4050, respectively, the findings showed negative relationships between ROA and the logarithms of total investment (TI), shareholder funds (SF), and underwriting profits (UWP). These results show that ROA tends to decline for general insurance companies in South Africa as TI, SF, and UWP rise.

Additionally, a favorable correlation was found between ROA and the earning-asset ratio. This implies that the ROA of South African general insurance companies tend to improve when the earning-asset ratio increases, suggesting a possibly positive effect on profitability. The study's important conclusions highlight how crucial it is for insurance companies to prioritize efficient risk management procedures.

Insurance businesses can sustain positive underwriting profit by putting these strategies into practice, such as reducing the possibility of claims and guaranteeing that premium costs accurately represent perceived risks. This could therefore increase their overall profitability.

Fadun, Aduloju, and Oluwaleye (2023) investigated the impact of reinsurance premiums accepted on the gross premium income of Nigerian non-life insurance carriers as well as the link between reinsurance premiums ceded and gross premium income. The research design used in this study is longitudinal. They used secondary data for all non-life insurers from 2007 to 2021 that was taken from the Nigeria Insurance Association (NIA) Digest report.

Descriptive statistics and auto-regressive distributed lag (ARDL) were used to analyze the data. The findings showed that reinsurance premiums accepted had a large favorable impact on the gross premium income of Nigerian nonlife insurance carriers, whereas reinsurance premiums ceded have a significant positive link with gross premium income.

Additionally, it was established that the gross premium revenue of Nigerian non-life insurance companies is impacted both immediately and over time by reinsurance premiums ceded and accepted. Reinsurance transactions have a substantial favorable impact on Nigerian non-life insurance companies' gross premium income, according to this study. In order to boost their gross premium income, this study suggests, among other things, that Nigerian non-life insurance companies enhance their

underwriting capabilities, particularly for high-risk industries like oil and gas, maritime, and aviation.

Nafiu and Ayuba (2023) looked at the performance of Nigerian listed insurance businesses and important financial parameters. Independent and dependent variables from the Nigerian insurance sector are used in an objective analysis of the study. Financial and accounting information from five randomly selected financial organizations are used to generate subsidiary tools during a ten-year period (2011–2020).

The created tools are analyzed using multivariate ordinary statistics and correlation. According to the results, the autonomous variables had weak and negligible direct membership in subordinate variation (ROA). Regarding the results, the study's recommendations are listed below. Effective and efficient underwriting of insured risk, judicious increases in capacity and retention values, and a reduction in transferred reinsurance costs are all important financial ratio factors on production.

Owusu and Owusu (2023) used a correlational research method to investigate how risk management strategies affected the profitability of non-life insurance companies in Ghana. Both primary and secondary data were used in the investigation. A structured questionnaire on risk management procedures (risk identification, risk analysis, risk control, and risk monitoring) was used to collect the primary data.

Interviews were conducted with 120 employees of ten (10) non-life insurance companies. The audited annual reports of ten chosen non-life insurance businesses in Ghana provided the secondary data (profit after tax). The Statistical Package for Social Sciences version 25 was used to fit Ordinary Least Squares Regression. The results show that while risk control and risk identification have a negative but statistically insignificant impact on the profitability of Ghanaian non-life insurance companies, risk monitoring as a risk management practice has a positive and statistically significant effect on profitability.

The study found, among other things, that risk identification, risk analysis, and risk control have a small but detrimental short-term effect on financial performance. Since risk monitoring was the only risk management strategy that significantly and favorably affected Ghanaian non-life insurance businesses' financial performance, the study advised them to focus more on it.

The impact of premium income, investment returns, claim costs, and running expenses on net profit at Sharia Life Insurance Company was investigated by Hissiyah and Meylianingrum (2023). This study takes a descriptive approach using quantitative approaches. The findings demonstrated that net profit was somewhat impacted by investment returns and premium income.

On the other hand, operating and claim costs had no discernible impact on net profit. The results of the simultaneous test indicate that Sharia life insurance net profit is significantly impacted by premium income, investment returns, claim expenses, and operating expenses either all at once or in combination.

In order to determine how premium income, underwriting ratio, return on equity, and return on investment affected an insurance company's profit, Natalia and Riwayati (2022) conducted a study. A quantitative approach was used in this investigation. The general insurance businesses listed on the Indonesia Stock Exchange between 2015 and 2019 were included in the population. Ten insurance companies were chosen for the study samples using a purposive sampling method.

Secondary data was the sort of data used in this investigation. The documentation approach was used for data collection, and multiple linear regression with a five percent significance threshold was used for data analysis. The analysis's findings demonstrated that: (1) premium income had a positive and significant impact on insurance profit; (2) the underwriting ratio had a positive and significant impact on insurance profit; (3) return on investment had a positive and significant impact on insurance profit; and (4) return on equity had neither a significant nor a negative impact on insurance profit.

Soye *et al.* (2022) investigated the connection between Nigerian general insurance companies' profitability and underwriting profit. Data from Nigerian general insurance companies during a ten-year period, from 2007 to 2018, were used in the study. The study's findings demonstrated a strong and favorable correlation between underwriting profit and profitability. This suggests that general insurance businesses become more profitable when underwriting profit rises.

Adeel, Habib, and Mehboob (2022) investigated how premiums affected Pakistani insurance companies' profits. The study sheds light on the performance of Pakistan's life insurance market. The purpose of this study is to ascertain how life insurance premiums affect profitability. The results are analyzed using regression analysis. The results of the study indicate that earned premium and underwriting profit are significantly correlated. Instead of growing the insurance industry's profit, premium earnings are rising while underwriting profit is declining.

Falade and Oyedokun (2022) used six chosen Nigerian insurance businesses as case studies to evaluate the connection between the determined claims ratio and the financial performance of listed insurance companies in Nigeria. The Nigerian Insurers Association Digest contains the firms' annual reports from 2011 to 2019, which provided data for the study's ex-post factor research design.

The analysis reveals that the financial performance of Nigerian insurance companies is significantly impacted by Net Claim, Net Premium, Expenses Ratio, and Risk-Based Capital. Therefore, the study concluded that insurance companies should, at

all costs, implement strategies to ensure proper management of Net Claim, Net Premium, and Risk-Based Capital and entrust these to experts in order to yield the necessary results.

It also suggested that claim managers collaborate with other parts of the insurer from the policy formation stage to its termination. In addition to preventing the payment of fraudulent claims, this will encourage the prompt payment of legitimate claims and boost the company's profitability through efficient cost control.

Oladunni1 and Eche (2022) investigated how reinsurance underwriting activities affected Nigerian insurance companies' asset management. An ex post facto research design was used. All 58 insurance and reinsurance firms that were registered with the National Insurance Commission (NAICOM) and the Nigerian Insurers' Association (NIA) as of 2018 were counted. For ten years, from 2009 to 2018, data for the study was gathered from the yearly publications of the National Insurance Commission and the Nigerian Insurance Digest.

The model of panel data was used. The study's hypotheses were examined at the 5% significance level. According to regression analysis, asset management (return on assets) of Nigerian insurance businesses is significantly impacted by reinsurance underwriting operations (Risk Retention Ratio and Reinsurance Dependent Ratio). The results validate the resource-based view theory's prediction. Given the importance of reinsurance in asset management, the report suggests, among other things, that regulatory agencies and shareholders in Nigeria's insurance sector establish suitable procedures to guarantee efficient underwriting methods.

Aduloju and Akindipe (2022) investigated the impact of life insurance companies' asset base size on profitability in Nigeria from 2011 to 2021. Profit after tax and asset size for the relevant period were calculated using data on life insurance companies' assets from the Nigerian Insurers Association's (NIA) insurance digest. The results of the stationarity test showed that the data are stationary at the 1%, 5%, and 10% significance levels.

Because the computed probability (F-statistic) value from the ordinary least squares regression is less than the significance level of 0.05, the data are statistically significant. The calculated linear coefficient of determination (R^2 = 0.738811) indicates that 73.8811 percent of life insurance companies' total assets account for the profit after tax. According to the study's findings, asset size has an impact on Nigerian insurance companies' financial performance.

Oladunni and Okonkwo (2022) investigated how risk retention affected Nigerian insurance companies' handling of claims. An ex post facto research design was used. All 58 insurance and reinsurance firms that were registered with the National Insurance Commission (NAICOM) and the Nigerian Insurers' Association (NIA) as of 2018 were counted. For ten years, from 2009 to 2018, data for the study was

gathered from the yearly publications of the National Insurance Commission and the Nigerian Insurance Digest.

Panel data regression analysis was used to analyze the data. The study's hypotheses were examined at the 5% significance level. A p-value of 0.0175 in the regression findings showed that risk retention (Risk Retention Ratio) had a statistically significant effect on claims management (reinsurer-insurer claims ratio) of insurance businesses in Nigeria.

To make technical staff training and retraining for efficient underwriting and claims management procedures a priority, the study advised insurance companies to use automated, actuarial evaluation and cloud computing technologies. Additionally, the management of insurance companies in Nigeria should continue or finance product development and innovation in order to boost sales volume.

The profitability of 42 reinsurers in Sub-Saharan Africa was examined by Olarewaju and Msomi (2022) between 1991 and 2020. They found that a number of factors, including gross domestic product, competition (HHI), premium growth, investment performance, underwriting risk, and operational efficiency, have an impact on these companies' profitability.

The system-generalized method of moments is used to analyze the data in this quantitative, dynamic investigation. According to the study, reinsurers should expand their range in order to maintain their high level of competition and increase premium growth, which will continue their profitability. Prior to signing a ceding agreement with insurers, a distinct department of trained experts should oversee ensuring that risk is adequately managed.

Obalola and Ukpong (2022) conducted an empirical analysis of the factors influencing life insurance firms' decision to cede in Nigeria. It stems from the idea that life insurers hardly ever engage in reinsurance, even though it is extremely advantageous to the insurance sector.

Therefore, the purpose of this study is to elaborate on the factors that influence Nigerian life insurance firms' reinsurance decisions and how each factor relates to ceded reinsurance. Purposive sampling was used to choose a sample size of seven (7) main life insurance companies in Nigeria using an ex-post facto research approach. The Nigerian Insurers Digest and a few insurance companies' websites provided the data, which covered the years 2011 to 2019. The data was subjected to unit root testing and descriptive analysis to support its applicability.

Panel data regression was used to further analyze the data, and Hausman and redundant fixed effect tests were used to reach a conclusion. Leverage and ceded reinsurance, firm size and ceded reinsurance, and return on assets and ceded reinsurance were all significantly correlated, according to the analysis's findings,

although underwriting risk and reinsurance pricing had negligible correlations with ceded reinsurance.

Additionally, there were positive correlations between the ratio of ceded reinsurance and all the explanatory variables. Therefore, it was determined that while underwriting risk and reinsurance pricing are not significant factors in these companies' decision to cede, debt, firm size, and return on assets are. It was suggested that politicians and regulators should harmonize precise laws on leverage, company size, and return on assets of life insurance in Nigeria in order to induce them to give up greater risks.

Based on the above review, the hypothesis that *there are significant effects of reinsurance risk retention ratio, reinsurance premium to surplus ratio and reinsurance loss ratio on return on assets of Nigeria Reinsurance Corporation* is formulated for this study.

5. Research Methodology

An *ex post facto* research design was adopted for this study. The data used were sourced from the Audited Financial Statement Reports of Nigeria Reinsurance Corporation from 1994 to 2024. The data collected was analyzed using descriptive statistics. Ordinary least squares (OLS) technique was used to determine the most significant and influential explanatory variables on the dependent variable.

The multiple linear regression model was specified below:

$$Y_i, t = \beta_0 + \beta_1 X_i, t + \beta_2 X_i, t + \ldots \beta_n X_{ni}, t + \mu_i, t \quad \text{(Equation 1)}$$

Where β_1, β_2…. β_n are the coefficients of the independent variables, and μ_t represents the stochastic error term. The model above indicates that "Y" is a linear function of X_1,1, X_1,2 … X_i,n. β_0 is the regression constant, X_1, X_2, …, X_n are independent variables. Functionally, the model is specified as:

$$ROA = f(RRR, PSR, LOR, SIZ) \quad \text{(Equation 2)}$$

Linearly, the model is transformed into:

$$ROA_{it} = \beta_0 + \beta_1 RRR_{it} + \beta_2 PSR_{it} + \beta_3 LOR_{it} + \beta_4 SIZ_{it} + \varepsilon_{it} \quad \text{(Equation 3)}$$

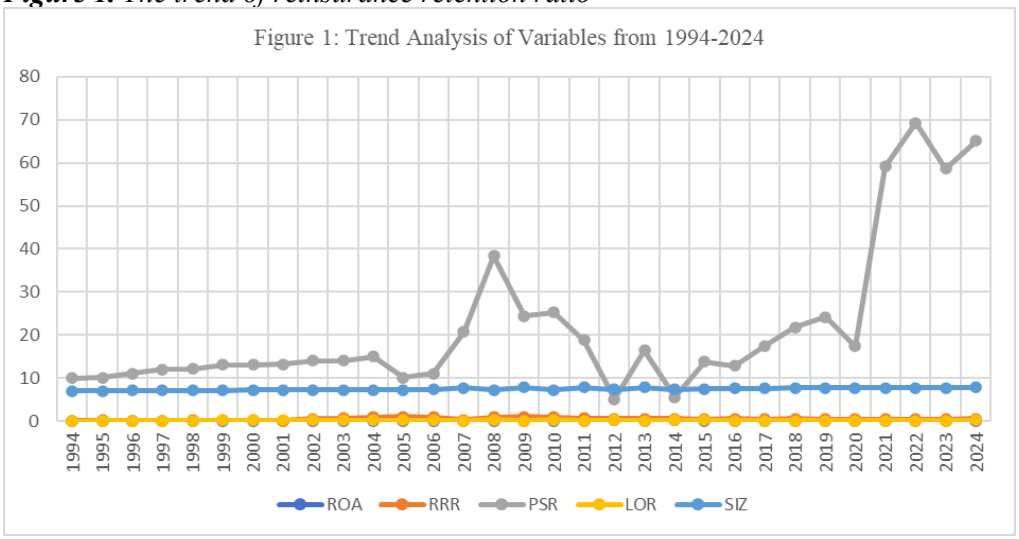
Where: ROA represents return on assets a proxy for performance; RRR represents reinsurance retention ratio; PSR represents reinsurance premium to surplus ratio; LOR represents reinsurance loss ratio; SIZ represents firm size; ε_{it} represents stochastic error term; β_0 is the regression constant; and $\beta_1 - \beta_4$ are the variables' coefficients.

6. Data Analysis Results

6.1 Trend Analysis

As seen in Figure 1, it depicts how the trend of reinsurance retention ratio, reinsurance premium to surplus ratio, reinsurance loss ratio, firm size and return on assets is changing. It demonstrates that the explanatory variables are most likely to maintain a very stable trend, with changes in the trend more likely to result in a commensurate shift in the return on assets.

Figure 1. *The trend of reinsurance retention ratio*



Source: *Own study, Microsoft Excel Data Analytics Output (2025).*

6.2 Descriptive Statistics

Table 1 shows that ROA has a mean score of 0.043 and has a standard deviation of 0.03, showing that the deviation from the mean is below the mean. This indicates low disparity in return on assets of Nigeria Reinsurance Corporation for different years. It further shows that RRR, PSR, LOR and SIZ have standard deviations lower than their mean scores indicating low level of disparity in the variables for different years.

Table 1. *Descriptive Statistics Analysis Result*

	ROA	LOR	PSR	RRR	SIZ
Mean	0.043226	0.142258	21.71806	0.510968	7.445484
Median	0.030000	0.120000	14.08000	0.500000	7.310000
Maximum	0.200000	0.300000	69.26000	1.060000	7.900000
Minimum	0.010000	0.020000	5.080000	0.100000	7.010000
Std. Dev.	0.034825	0.075397	17.48066	0.290153	0.293653
Skewness	2.296344	0.503061	1.739253	0.261612	0.180547

Kurtosis	8.278601	2.117792	4.733180	2.152406	1.466454
Jarque-Bera	63.23538	2.312822	19.50923	1.281565	3.206112
Probability	0.000000	0.314613	0.000058	0.526880	0.201280
Sum	1.340000	4.410000	673.2600	15.84000	230.8100
Sum Sq. Dev.	0.060277	0.170542	9167.199	2.525671	2.586968
Observations	31	31	31	31	31

***Source**: E-views Data Analytics Output (2025)*

6.3 Hypothesis Testing

In order to test the hypothesis, which states that there are significant effects of reinsurance risk retention ratio, reinsurance premium to surplus ratio and reinsurance loss ratio on return on assets of Nigeria Reinsurance Corporation, Ordinary Least Squares regression analysis was conducted and the results shown in Table 2.

***Table 2.** OLS Regression Analysis Results*

Dependent Variable: ROA				
Method: Least Squares				
Date: 11/07/25 Time: 13:14				
Sample: 1994 2024				
Included observations: 31				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.028866	0.255553	4.026043	0.0004
RRR	0.103712	0.036164	2.867819	0.0081
PSR	0.001165	0.000446	2.610137	0.0148
LOR	0.530387	0.141579	3.746230	0.0009
SIZ	0.144374	0.034699	4.160822	0.0003
R-squared	0.448085	Mean dependent var		0.043226
Adjusted R-squared	0.363175	S.D. dependent var		0.044825
S.E. of regression	0.035771	Akaike info criterion		-3.676689
Sum squared resid	0.033268	Schwarz criterion		-3.445401
Log likelihood	61.98868	Hannan-Quinn criter.		-3.601295
F-statistic	55.27718	Durbin-Watson stat		1.541146
Prob(F-statistic)	0.000000			

***Source**: E-views Data Analytics Output (2025).*

Since the calculated p-values of 0.008, 0.01, and 0.00 were less than 5% (0.05) level of significance, the finding showed that there are significant effects of reinsurance risk retention ratio, reinsurance premium to surplus ratio and reinsurance loss ratio on return on assets of Nigeria Reinsurance Corporation.

6.4 Discussion of Findings

A regression coefficient value of 1.028866 implies a positive effect of risk retention on the performance of Nigeria Reinsurance Corporation. The coefficient of determination (R^2) was 0.44 which implies that about 44% variations in the performance of Nigeria Re were caused by risk retention factors while the remaining 56% were caused by other variables not incorporated into the model. The F- statistic of 55.27 confirmed that the model has a good fit.

The finding showed that there are significant effects of reinsurance risk retention ratio, reinsurance premium to surplus ratio and reinsurance loss ratio on return on assets of Nigeria Reinsurance Corporation. This finding is consistent with the findings of (Dutta, 2020; Alamsyah, 2021; Lalon and Das, 2022) that there is a favorable correlation between risk retention ratios and the profitability of reinsurance firms. The implications of this finding point to the fact that Nigeria Reinsurance Corporation should carefully manage risk retention, premium pricing, and claims management to optimize return on assets.

7. Conclusions and Recommendations

The finding of this study revealed that there are significant effects of reinsurance risk retention ratio, reinsurance premium to surplus ratio and reinsurance loss ratio on return on assets of Nigeria Reinsurance Corporation. It was concluded that there is a significant influence of risk retention on the performance of the Nigeria Reinsurance Corporation in Nigeria.

Management of Nigeria Reinsurance Corporation should continually assess the adequacy of their premium-to-surplus ratio to support their underwriting activities, which can also help them in benchmarking for rating agencies and regulators to evaluate the solvency and risk management practices of the company, leading to improved credit ratings and increased confidence from stakeholders.

There is also a need for Nigeria Reinsurance Corporation to assume a significant portion of risk from primary insurers, absorb losses without jeopardising their financial stability. The minimal level of reinsurance loss ratio should be sustainable to boost the return on assets of Nigeria Reinsurance Corporation.

References:

Abass, O. 2025. An Analysis of Asset Utilisation and Profitability of Quoted Non-life Insurance companies in Nigeria. The Journal of Accounting and Management, 15(2), 122-129.

Adeel, R., Habib, S., Mehboob, S. 2022. Impact of premium on profit of insurance companies in Pakistan. Pakistan Journal of Humanities and Social Sciences, 11(4), 4503-4513.

Al-Ali, A.H.H., Al-Shabeeb, S.K.I. 2024. Relationship between profitability indicators and maximization market value added and intrinsic for the industrial companies. Global Business & Finance Review (GBFR), 29(2), 71-84.

Alamsyah, D.P., Othman, N.A. 2021. Risk Retention Strategy for Supply Chain with Risk Aversion. International Journal of Entrepreneurship, 25(5), 1-11.

Alshehadeh, A.R., Elrefae, G.A., El Qirem, I.A., Hatamleh, H.M., Alkhawaja, H. 2024. Impact of profitability on investment opportunities and its effect on profit sustainability. Uncertain Supply Chain Management, 12(2), 871-882.

Amani, F.A., Markkonen, M. 2020. Risk management and financial performance of commercial banks in Tanzania. Journal of Financial Risk Management, 9(2), 123-138.

Ananda, F., Fajriansyah, F., Annisa, A., Novita, N., Dewi, M.K. 2024. The Effect of Operating Income and Operating Costs on Net Income. Jurnal Ilmu Manajemen dan Ekonomika, 17(1), 13-26.

Arantik, R., Sativa, A. 2025. Life insurance company policy on insurance claims from beneficiaries based on policy discoveries outside the claim period (case study of Manulife Medan insurance company). Legal Brief, 14(3), 570-579.

Arrow, K.J. 1963. Uncertainty and the welfare economics of medical care. The American Economic Review, 53(5), 941-973.

Attaullah, D.A.N., Manik, J.L., Chandritike, S.N., Yuniarti, E. 2025. Revenue, Operating Expenses, and Profitability in Assessing Financial Performance in the Manufacturing Industry. Asian Journal of Applied Business and Management, 4(2), 465-472.

Banerjee, P., Guha Deb, S. 2024. Working capital management efficiency, managerial ability, and firm performance: new insights. Applied Economics, 56(33), 4001-4018.

Banthin, J., Buettgens, M., Simpson, M., Levitis, J. 2024. Who Benefits from Enhanced Premium Tax Credits in the Marketplace? Washington (DC): Urban Institute.

Bardadym, T. 2024. Accounting provision for management of sales expenses in accordance with the marketing strategy of the enterprise. Ekonomika ta Derzhava, 1(5), 61-66.

Bernard, C. 2024. Risk sharing and pricing in the reinsurance market. In: Handbook of Insurance: Volume II (pp. 325-349). Cham: Springer Nature Switzerland.

Boadi, E.K., Li, Y. 2013. An empirical analysis of leverage and return on equity: Ghana Stock Exchange. Journal of Accounting and Finance, 13(5), 124-134.

Borch, K. 1960. An attempt to determine the optimum amount of stop loss reinsurance. Transactions of the 16th International Congress of Actuaries, 1, 597-610.

Chang, V.Y. 2024. The impact of market competitors on the demand for reinsurance. Managerial Finance, 50(10), 1773-1789.

Chao, Y., Xiao, M. 2024. The Limit of Market-share Contracts. Available at SSRN 4598597.

Cheung, K.C., Yam, S.C.P., Yuen, F.L., Zhang, Y. 2025. Optimal design of reinsurance contracts under adverse selection with a continuum of types. arXiv preprint arXiv:2504.17468.

Cremer, F., Sheehan, B., Mullins, M., Fortmann, M., Materne, S., Murphy, F. 2024. Enhancing cyber insurance strategies: exploring reinsurance and alternative risk transfer approaches. Journal of Cybersecurity, 10(1), 1-27.

Dawood, A.M. 2024. Impact of administration and production expenses on profit. Journal of Finance, Accounting and Management, 15(1), 14-31.

Daya, E.A.A. 2025. Evaluating the Operational Efficiency of Jordan Islamic Bank and Housing Bank for Trade and Finance Using the ROE Model. Journal of Islamic and Religious Studies, 10(1), 11-22.

Deari, F., Kukeli, A., Barbuta-Misu, N., Virlanuta, F.O. 2024. Does working capital management affect firm profitability? Evidence from European Union countries. Journal of Economic and Administrative Sciences, 40(5), 1060-1080.

Dutta, P. 2020. Impact of Digitalization on Stock Market Risk: A Study on Selected Indian Companies. Journal of Risk and Financial Management, 13(11), 272-291.

Ezeife, E., Eyeregba, M.E., Mokogwu, C., Olorunyomi, T.D. 2024. Integrating predictive analytics into strategic decision-making: A model for boosting profitability and longevity in small businesses across the United States. World journal of advanced research and reviews, 24(2), 2490-2507.

Fadun, O.S. 2023a. Insurance and Financial Stability: Evidence from Nigeria. Journal of Financial Regulation and Compliance, 31(3), 345-362.

Fadun, O.S. 2023b. Financial Inclusion and Insurance Penetration in Nigeria. International Journal of Finance, Insurance and Risk Management, 13(1), 1-15.

Fadun, O.S., Aduloju, S.A., Oluwaleye, T.O. 2023. Analysis of reinsurance transactions and gross premium income of non-life insurance companies in Nigeria. Journal of Accounting and Management, 13(3), 2-11.

Fadun, O.S., Silwimba, F. 2023a. Impact of Financial Technology on Insurance Sector Growth in Nigeria. Journal of Financial Innovation, 9(2), 1-18.

Fadun, O.S., Silwimba, F. 2023b. Insurance Sector Development and Economic Growth in Nigeria: A Post-COVID-19 Analysis. International Journal of Business and Emerging Markets, 15(3), 250-268.

Faghanizadeh, V., Askari, F., Partovi, B. 2024. Effect of employer insurance premium rate on operating profit per share and change in net sales revenue in companies listed on the Tehran Stock Exchange. International Journal of Nonlinear Analysis and Applications, 15(3), 201-210.

Farrukh, A., Sajjad, A. 2025. Investigating supply chain disruptions and resilience in the textile industry: A systemic risk theory and dynamic capability-based view. Global Journal of Flexible Systems Management, 26(Suppl. 1), 57-83.

Fayzulloyevich, M.S. 2025. Conceptual foundations for improving the efficiency of underwriting services in insurance activities. Innovation Science and Technology, 1(4), 54-56.

Fitriana, L., Sinarasri, A. 2024. Factors Affecting Financial Statement Fraud in Banking Sector: A Agency Perspective. Maksimum: Media Akuntansi Universitas Muhammadiyah Semarang, 14(1), 102-113.

Frees, E.W., Butt, A., Shi, P. 2025. Algorithmic Insurable Risk Portfolios. North American Actuarial Journal, 1-17.

Ghazalat, A., AlHallaq, S. 2024. Predicting and assessing bankruptcy risk: the role of accounting conservatism and business strategies. Journal of Financial Reporting and Accounting.

Gianfredi, V., Nucci, D., Pennisi, F., Maggi, S., Veronese, N., Soysal, P. 2025. Aging, longevity, and healthy aging: the public health approach. Aging Clinical and Experimental Research, 37(1), 1-12.

Giráldez-Puig, P., Moreno, I., Perez-Calero, L., Guerrero Villegas, J. 2025. ESG controversies and insolvency risk: evidence from the insurance industry. Management Decision, 63(2), 610-639.

Grandis, R.O., Nursiam, N. 2024. The Effect of Tax Planning, Deferred Tax Expense, and Profitability on Profit Management. Indonesian Interdisciplinary Journal of Sharia Economics (IIJSE), 7(3), 5738-5754.

Guan, G., Liang, Z., Xia, Y. 2024. Many-insurer robust games of reinsurance and investment under model uncertainty in incomplete markets. arXiv preprint arXiv:2412.09157.

Gülveren, A. 2024. Influence of expected premium on optimal reinsurance and investment strategy.

Gupta, M., Bansal, R., Sharma, A., Grima, L. 2024. A Review of the Role of Insurance in Risk Management. The Application of Emerging Technology and Blockchain in the Insurance Industry, 337-352.

Han, X., Wang, N., Che, S., Yang, H., Zhang, K., Xu, S.X. 2024. Enhancing investment analysis: Optimizing AI-Agent collaboration in financial research. In: Proceedings of the 5th ACM International Conference on AI in Finance (pp. 538-546).

Hawley, F.B. 1893. The Risk Theory of Profit. The Quarterly Journal of Economics, 7(4), 459-479.

Hissiyah, H., Meylianningrum, M. 2023. The effect of premium income, investment returns, claim expenses, and operating of net profit on Sharia life insurance company. International Journal of Islamic Business Ethics, 8(1), 1-11

Horvey, S.S., Odei-Mensah, J. 2025. Re-examining the microeconomic and macroeconomic determinants of nonlife insurers profitability in South Africa: insights from linear and threshold analysis. Journal of Innovation and Entrepreneurship, 14(1), 30.

Islam, I.M.M. 2025. Linking working capital efficiency to profit maximisation: A conceptual analysis. In: Economic Forum (Vol. 15, No. 1, pp. 93-102). Lutsk, Ukraine: Lutsk National Technical University.

Jansen, M., Nguyen, H.Q., Shams, A. 2025. Rise of the machines: The impact of automated underwriting. Management Science, 71(2), 955-975.

Kabir, S., Sharan, V.V. 2024. Ensuring the future: Improving the Insurance process by Identifying Risks in Battery Energy Storage Projects.

Kao, C., Wu, W.Y., Chang, W.S., Liu, S.T., Huang, C.H., Huang, Y.S., ..., Wang, I.L. 2025. A business function approach for measuring enterprise competitiveness: An illustration with Taiwanese listed companies. Asia Pacific Management Review, 100369.

Keynes, J.M. 2024. A treatise on money: the pure theory of money. In: The History of Banking II, 1844-1959, Vol. 10 (pp. 86-104). Routledge.

Khoualed, A., Bouzerb, K., Almi, H. 2025. The evolution of reinsurance supply in Algeria: An analytical study. MEST Journal, 13(1).

Lalon, R.M., Das, S. 2022. Risk retention and risk transfer strategies in supply chain finance: A comparative study. Journal of Risk and Financial Management, 15(6), 264-278.

Li, X., Chiu, S.C., Lin, J.H., Xie, Y. 2024. Assessing insurer guarantee cover and risk retention toward SDG 3: a structure-break down-and-out call valuation. Humanities and Social Sciences Communications, 11(1), 1-10.

Lin, L., Liu, F., Liu, J., Yu, L. 2025. The optimal reinsurance strategy with price-competition between two reinsurers. Scandinavian Actuarial Journal, 2025(1), 51-78.

Lokhande, S.S., Ansari, A., Hassan, R., Sanusi, F.N., Nobanee, H. 2024. A Comprehensive Review of Reinsurance Practices and Trends. Available at SSRN 4977625.

Ma, M., Li, Q. 2024. Research on Insurance Company Insolvency Standard from a Comparative Perspective. Eur. Ins. L. Rev., 8.

Machmud, M., Tijjang, B., Latif, N., Hermawan, H., Salehe, W.R. 2024. Profitability and Activity Ratio in Measuring Financial Performance. In: IECON: International Economics and Business Conference (Vol. 2, No. 1, pp. 600-613).

Maggioni, M., Turchetti, G. 2024. Reinsurance and Coinsurance. In: Fundamentals of the Insurance Business (pp. 355-374). Cham: Springer International Publishing.

Maggioni, M., Turchetti, G. 2024. Underwriting Process. In: Fundamentals of the Insurance Business (pp. 453-470). Cham: Springer International Publishing.

Majka, M. 2024. The Crucial Role of Insurance in Risk Mitigation Strategies.

Marangwanda, A. 2025. Reinsurance as a Strategic Governance Tool: Enhancing Risk Resilience in Africa's Insurance Sector. International Journal of Advanced Business Studies, 4(4), 18-38.

Marshall, A. 2024. Money, credit and commerce. In: Business Cycle Theory, Part I Volume 1 (pp. 227-258). Routledge.

Masithoh, N. 2024. Financial Management Strategies to Increase Company Profitability. International Journal of Health, Economics, and Social Sciences (IJHESS), 6(4), 936-941.

Mesyef, M.N. 2024. The effect of reinsurance operations on reducing the risks facing the insurance companies in Palestine (Doctoral dissertation, Magyar Agrárés Élettudományi Egyetem).

Mitra, I., Seo, T., Xu, Y. 2024. High discounts and low fundamental surplus: An equivalence result for unemployment fluctuations. Management Science, 70(6), 4051-4068.

Msomi, T.S. 2024. Do underwriting profit factors affect general insurance firms' profitability in South Africa? Insurance Market and Companies, 15(1), 1-11.

Murtiningrum, W., Wahyuningsih, E. 2024. Analysis of the effect of financial ratios on ROA at Commercial Banks on the IDX. Asean International Journal of Business, 3(1), 12-19.

Mwangi, J.M. 2020. Effect of financial risk on profitability of commercial banks in Kenya. Master's thesis, University of Nairobi.

Nafiu, A.T., Ayuba, A. 2023. Risk retention strategy and financial performance of selected insurance companies in Nigeria. Nigeria Journal of Risk and Insurance, 14(1), 42-61.

Natalia, E., Riwayati, H. 2022. The effect of premium growth, claim ratio, and risk-based capital on the profitability of insurance companies listed on the Indonesia Stock Exchange. International Journal of Economics, Business and Management Research, 6(11), 1-13.

Nguyen, Q.K. 2024. Women in top executive positions, external audit quality and financial reporting quality: evidence from Vietnam. Journal of Accounting in Emerging Economies, 14(5), 993-1019.

Nguyo, L.W., Anene, E. 2024. Effect of coopetition on growth of insurance firms in Kenya. International Academic Journal of Innovation, Leadership and Entrepreneurship, 2(4), 52-105.

Njagi, R., Maina, E., Kiai, R. 2025. Effect of Mergers and Acquisitions on the Competitiveness of Insurance Companies in Kenya: The Moderating Effect of Competency Trap. Journal of Business, Economics and Management Research Studies, 3(2).

Nugraha, P.W.A., Ariefianto, D. 2024. The Effect of Regime Supervision, Risk Appetite and Profile Actuarial on Financial Health Life Insurance Company in Indonesia 2006-2018. Media Bina Ilmiah, 18(8), 2031-2042.

Obalola, M.A., Ukpong, M.S. 2022. Reinsurance and the determinants of the ceding decision of life insurance companies in Nigeria: An empirical analysis. Journal of Corporate Governance, Insurance, and Risk Management, 9, 169-189.

Oladunni, O.E., Okonkwo, I.V. 2022. Impact of risk retention on claims management of insurance companies in Nigeria**.** Fuoye Journal of Finance and Contemporary Issues, 3(1), 63-79.

Oladunni, O.E., Olaolu, E.D. 2024. Effect of claims settlement on profitability of insurance business in Nigeria. Journal of Quantitative Finance and Economics, 6(1), 27-46.

Oladunni, O.E., Olaolu, E.D. 2024. Effect of claims settlement on profitability of insurance business in Nigeria. Journal of Quantitative Finance and Economics, 6(1), 27-46.

Olaiya, K.I. 2025. Impact of underwriting and financial ratios on profitability: an empirical analysis of insurance firms. Modern Management Review, 30(2), 113-127.

Olarewaju, O.M., Msomi, T.S. 2022. Factors affecting the profitability of reinsurance companies in sub-Saharan Africa: Evidence from dynamic panel analysis. Cogent Business & Management, 9(1).

Panham, D.S., Louzada, F., Ramos, P.L. 2024. Reducing delivery insurance costs through risk score model for food delivery company. Scientific reports, 14(1), 10994.

Phoung, N.H. 2025. Competitive Strategies and Performance of Insurance Companies in Myanmar (Nang Hom Phoung, 2025) (Doctoral dissertation, MERAL Portal).

Polontoh, H. 2024. Legal Responsibility of the Insurance Company for Unpaid Participant Claims. Journal of World Science, 3(1), 105-110.

Rajak, R. 2024. Determinants of the Solvency of Life Insurance Companies in Nepal (Doctoral dissertation, Faculty of Management).

Reschiwati, R., Solikhah, S. 2018. The influence of Current Ratio, Debt to Equity Ratio, and Return on Assets on Dividend Payout Ratio. Journal of Applied Accounting and Taxation, 3(2), 147-154.

Rodriguez, V.H.P., Aguilar, H.E.V., Delgado, F.M.C., Santa Cruz, L.D.CS., Benavides, A. M.V., Salazar, C.A.H., ..., Suyón, A.A. 2024. Challenges in the Relationship between Liquidity and Profitability: Perspectives from a Literature Review. Revista de Gestão Social e Ambiental, 18(1), 1-17.

Romanosky, S., Dixon, L., Willis, H.H., Briggs, R.J. 2025. Insuring catastrophic cyber risk. Romanosky, Sasha, Lloyd Dixon, RJ Briggs, and Henry H. Willis, Insuring Catastrophic Cyber Risk, RAND Corporation, RR-A3817-1.

Safiu, I., Shomuyiwa, A. 2024. Impact of claims settlement on profitability of general insurance companies in Nigeria: a study of selected listed general insurance companies. Journal of Economic Development, Environment and People, 13(1), 67-83.

Saleh, E.J. 2025. Legal Conditioning of an Unearned Payment Incident in Bank Cash Transfers. Journal of Ecohumanism, 4(2), 618-630.

Salter, A.W. 2024. Rationally revealing religion: in Défense of Ekelund and Tollison on method. Public Choice, 201(1), 27-38.

Shi, Z., Landriault, D., Liu, F. 2024. Performance-based variable premium scheme and reinsurance design. arXiv preprint arXiv:2412.01704.

Shumway, R.H., Stoffer, D.S. 2024. Time series regression and exploratory data analysis. In: Time series analysis and its applications: With R examples (pp. 49-83). Cham: Springer Nature Switzerland.

Sim, A., McNeilage, A.G., Rebbeck, T., Ashton-James, C.E. 2025. Claimant and clinician perspectives on sources of claimant distress in interactions with Australian compensation schemes: a qualitative study. Disability and Rehabilitation, 47(13), 3323-3333.

Singh, R., Gupta, C.P., Chaudhary, P. 2024. Defining Return on Assets (ROA) in empirical corporate finance research: a critical review. Empirical Economics Letters.

Singhal, N., Goyal, S., Singhal, T. 2024. Decentralized Insurance: Reshaping the Future of Coverage. In: Potential, Risks, and Ethical Implications of Decentralized Insurance (pp. 1-48). Singapore: Springer Nature Singapore.

Singreddy, S. 2025. A deep dive into auto insurance coverage, premium calculations, and automated claims management. Available at SSRN 5337469.

Skaf, Y., Eid, C., Thrassou, A., El Nemar, S., Rebeiz, K.S. 2024. Technology and service quality: achieving insurance industry customer satisfaction and loyalty under crisis conditions. EuroMed journal of business.

Skevofilax, M. 2024. Ultimate Profit Management: Maximizing Profitability as You Grow Your Business. Productivity Press.

Soye, Y.A., Olumide, R.O., Adeyemo, D.L. 2022. Reinsurance: A Risk Management Instrument for Insurance Companies' Profitability (A Case of Non-Life Insurance in Nigeria). Economic Insights-Trends & Challenges, (2).

Suciu, A.M., Paun, D., Duma, F.S. 2021. IFRS 17 and the Challenges for the Insurance Industry. Economic Sciences, 14(1), 1-12.

Sudacevschi, M., Stefan Duicu, V.M. 2024. Financial Performance Analysis of The Company Through Profitability Ratios. Challenges of the Knowledge Society, 17(2068-7796).

Thien, N.H., Asif, J., Kweh, Q.L., Ting, I.W.K. 2024. Firm efficiency and corporate performance: the moderating role of controlling shareholders. Benchmarking: An International Journal, 31(8), 2602-2623.

Tutcu, B., Kayakuş, M., Terzioğlu, M., Ünal Uyar, G.F., Talaş, H., Yetiz, F. 2024. Predicting Financial Performance in the IT Industry with Machine Learning: ROA and ROE Analysis. Applied Sciences, 14(17), 7459.

Twaambo Jr, W. 2024. Strategic drivers for market penetration in Zambia's insurance industry (Doctoral dissertation, Heriot-Watt University).

Wahyuddin, W., Mauliyana, M. 2021. The Effect of Financial Literacy and Financial Technology on Financial Inclusion. Journal of Economics and Business, 10(2), 123-136.

Wang, L., Hua, S., Liu, Y., Lu, Z., Zhang, L., Liu, L., Szolnoki, A. 2025. Strategic competition in informal risk-sharing mechanisms versus collective index insurance. Journal of the Royal Society Interface, 22(228), 20250163.

Wang, N., Siu, T.K., Fan, K. 2024. Robust reinsurance and investment strategies under principal–agent framework. Annals of Operations Research, 336(1), 981-1011.

Wati, R., Violinda, Q., Amelia, D.R. 2024. The effect of liquidity, solvency, and profitability ratios on financial performance in telecommunication companies listed on the Indonesia Stock Exchange for the 2021-2023 period. Jurnal Bisnis Kolega, 10(1), 36-48.

Widnyana, W., Budi Susilo, D.D., Suarjana, W., Antari, N.P.P., Putu Sintia Putri, G.A., Shafie, N.A. 2024. A study on the probability of sustainability of state-owned enterprises (a review from the perspective of the bankruptcy model): article. Asia-Pacific Management Accounting Journal (APMAJ), 19(1), 103-120.

Yao, D., Zhu, J. 2024. Optimal reinsurance under a new design: two layers and multiple reinsurers. Quantitative Finance, 24(5), 655-676.

Younis, H., Salem, H.M., Alsanea, M.S., Elemam, H.Z., Abaker, A.O. 2025. Analysis of the Factors Affecting the Financial Performance of Insurance Companies using Statistical Modelling. Journal of Applied Science, Engineering, Technology, and Education, 7(1), 171-180.

Yusra, M.Y. 2024. The Influence of Premium Income, Claims and Operational Costs on Asset Growth. Internasional Journal of Economic, Agribisnis and Development Studies, 1(3), 85-92.

Zakaria, M.F.R.B., Shmsuddin, M.H., Harun, H. 2025. Profit Commission from Reinsurance Arrangement: An Analysis from Shariah Perspective. Journal of Islamic Social Finance, 3(1).

Zhang, B., Peng, B. 2025. Artificial Intelligence and the Development of "Specialized, Refined, Unique, and Innovative" Small-and Medium-Sized Enterprises. Managerial and Decision Economics, 46(2), 843-861.

Zopounidis, C., Lemonakis, C. 2024. The company of the future: Integrating sustainability, growth, and profitability in contemporary business models. Development and Sustainability in Economics and Finance, 1, 100003.