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Decomposition of the Determinants of Return on Equity (ROE) in the Indonesian Insurance Industry: Implementation of the Du Pont Method

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Abstract

This study uses a modified Du Pont decomposition approach to analyse the determinants of Return on Equity (ROE) in the Indonesian insurance industry. The research was conducted on PT Asuransi Ramayana Tbk and PT Asuransi Jasa Tania Tbk for the 2022-2023 period, focusing on the identification and analysis of the components forming ROE. The research methodology employed a descriptive quantitative approach with a modified Du Pont analysis to accommodate the specific characteristics of the insurance industry. The findings reveal significant differences in the ROE performance of the two companies. PT Asuransi Ramayana Tbk recorded an ROE of 13.08% in 2023, supported by better operational efficiency (combined ratio of 78.76%) and a significant increase in investment returns (investment yield of 9.42%). Meanwhile, PT Asuransi Jasa Tania Tbk improved ROE from 0.18% to 1.24%, primarily driven by an increase in net profit margin from 0.35% to 2.11%. The decomposition analysis identified three key factors influencing ROE: operational efficiency, as reflected in the combined ratio; investment management effectiveness, as seen from the investment yield; and capital structure optimisation, indicated by financial leverage. These findings provide a systematic framework for insurance company management to optimise economic performance and for regulators to develop policies that support the industry's sustainability.

Keywords: Du Pont Analysis, Insurance Industry, Investment Management, Operational Efficiency, Return on Equity

Introduction

The insurance industry plays a strategic role in Indonesia's financial system as a non-bank intermediary institution providing risk transfer and mitigation mechanisms. Data from the Financial Services Authority shows significant growth in the insurance sector, with total assets reaching IDR 1,850.7 trillion for PT Asuransi Ramayana Tbk and IDR 498.7 trillion for PT Asuransi Jasa Tania Tbk in 2023. However, there is a striking disparity in Return on Equity

(ROE) performance, with PT Asuransi Ramayana Tbk recording an ROE of 13.08%, while PT Asuransi Jasa Tania Tbk only reached 1.24% (Chen & Lee, 2023).

An analysis of the financial statements of the two companies reveals several critical phenomena. First, there was a significant fluctuation in the gross premiums of PT Asuransi Ramayana Tbk, which declined from IDR 2,198.29 billion (2022) to IDR 2,129.14 billion (2023), indicating challenges in core revenue growth. Second, the claims ratio was volatile, as reflected in an increase in the combined ratio, highlighting pressure on underwriting profitability (Wang & Zhang, 2022). Third, there were significant differences in investment returns, with PT Asuransi Ramayana Tbk recording an increase from IDR 31.81 billion to IDR 117.75 billion, while PT Asuransi Jasa Tania Tbk achieved only a moderate increase from IDR 6.75 billion to IDR 8.57 billion (J. H. Kim & Park, 2021).

The empirical study by (Lee & Thompson, 2022) on 150 insurance companies in Asia during the 2018-2023 period identified that underwriting efficiency contributed 45% to ROE, investment returns 35%, and capital management 20%. Research by (Rahman et al., 2023) found that insurance companies with optimal investment portfolio diversification and effective risk management tend to have more stable and higher ROEs.

The transformation of the insurance industry further emphasises the urgency of this study. (Chen & Wu, 2024) identified that digitalisation is altering the fundamentals of the insurance business, impacting revenue structure and profitability. (Liu & Martinez, 2023) Highlighted the importance of recalibrating financial performance analysis models in response to changing consumer preferences and advancing technology. Implementing IFRS 17 and strengthening Risk-Based Capital add complexity to ROE management (Yamamoto & Chen, 2023).

The research gap has been identified across several dimensions. First, the study (Kumar & Shah, 2022) on the determinants of ROE in the Asian insurance sector focused on macroeconomic factors without considering the interactions between internal financial components. Second, the research by (Johnson et al., 2021) employed a conventional analytical approach that did not accommodate the unique characteristics of the insurance industry. Third, (Hassan & Wong, 2023) highlighted the limitations of the traditional Du Pont model in analysing the performance of insurance companies in developing countries.

Based on these phenomena and research gaps, the research problems are formulated as follows:

1. How can the decomposition of ROE determinants in the Indonesian insurance industry be analysed using a modified Du Pont method?
2. What is the relative contribution of operational efficiency, investment management, and capital structure to achieving ROE?
3. What strategies can be developed to optimise ROE based on the results of the Du Pont analysis?

Literature Review

Return on Equity and Its Components in the Insurance Industry

Return on Equity (ROE) is a fundamental metric for evaluating the financial performance of insurance companies. (Chen & Lee, 2023) define ROE as a key indicator that measures a company's effectiveness in generating shareholder returns from the invested capital. (Wang & Zhang, 2022); Dyah 1 identify the unique characteristics of ROE in the insurance industry, which is formed by three primary revenue sources: underwriting income, investment income, and fee-based income. This concept is reinforced by (Rahman et al., 2023), who found that the interaction of these three components determines the sustainability of an insurance company's profitability.

A comprehensive study (Matsuda & Chen, 2024) on 200 global insurance companies revealed that the relative contribution of ROE components varies depending on the business model and market conditions. Underwriting income contributes 40-50% to ROE in mature markets, whereas in emerging markets, its proportion reaches 55-65% due to higher underwriting margins. (Lee & Thompson, 2022) confirmed these findings in the Asian context, adding that underwriting income volatility is higher in emerging markets.

The Evolution of the Du Pont Model in Insurance Performance Analysis

The Du Pont Model has undergone significant evolution in its application to the insurance industry. (S. Kim & Zhang, 2023) traced the transformation from the traditional three-component model to a more comprehensive framework. (Johnson et al., 2021) identified four phases of evolution:

1. Basic Du Pont (1920s): ROE = Profit Margin × Asset Turnover × Financial Leverage
2. Extended Du Pont (1970s): Integration of tax effects and interest burden
3. Modified Insurance Du Pont (1990s): Incorporation of underwriting and investment components
4. Digital Era Du Pont (2020s): Integration of digital metrics and risk-adjusted returns

(Hassan & Wong, 2023) expanded this understanding by analysing how the unique characteristics of the insurance industry influence the interpretation of Du Pont components. For example, asset turnover in insurance must consider the underwriting cycle and liability duration. (Chen & Wu, 2024) added a new dimension by integrating technological aspects into the Du Pont analysis, including digital efficiency and automated underwriting metrics.

Adaptation of the Du Pont Model for Emerging Markets

(Liu & Martinez, 2023) Identified specific challenges in implementing the Du Pont Model in emerging markets. (Hidayatulloh et al., 2024) Found that macroeconomic volatility and dynamic regulations affect the stability of Du Pont components. (J. H. Kim & Park, 2021) proposed modifications to the model to accommodate the characteristics of emerging markets:

1. Incorporation of regulatory capital efficiency
2. Adjustment for the market development stage
3. Integration of risk-weighted performance metrics

(Yamamoto & Chen, 2023) Made significant contributions by developing a framework that integrates ASEAN-specific regulatory aspects. Their study of 50 insurance companies in five ASEAN countries demonstrated that the effectiveness of the Du Pont Model improves significantly with contextual adaptation.

Implementation of the Du Pont Model and Indonesia's Digital Transformation

The implementation of the Du Pont Model in the context of Indonesia's insurance industry exhibits unique characteristics shaped by domestic regulations and market dynamics. (Yamamoto & Chen, 2023) Identified that the application of Risk-Based Capital (RBC) in Indonesia significantly influences the structure of Du Pont analysis. The OJK regulation requiring a minimum RBC of 120% creates a trade-off between optimising ROE and regulatory compliance. This analysis is reinforced by (Nakamura & Lee, 2024) study, which examines the impact of regulations on insurance profitability in Southeast Asia.

Digital transformation in Indonesia's insurance industry has shifted the paradigm of financial performance analysis. (Chen & Wu, 2024) analysed how automated underwriting has restructured operational costs and accelerated the underwriting cycle. The efficiency gained from this automation has contributed to a 15-20% increase in underwriting margins for companies fully adopting the technology. (Thomson et al., 2023) Further, it was noted that integrating artificial intelligence into underwriting processes enhances efficiency and improves risk assessment accuracy.

Digital distribution has become a critical component in the transformation of Indonesia's insurance industry. (Wang & Zhang, 2022) identified a significant reduction in customer acquisition costs through digital channels, although substantial initial technology investments are required. Research by (Rodriguez & Kim, 2024) revealed that insurance companies with integrated omnichannel strategies demonstrated an average ROE increase of 2.5% compared to competitors relying on traditional distribution methods.

Investment management in the digital era has undergone a fundamental transformation. (Hassan & Wong, 2023) analysed the impact of algorithmic trading and real-time portfolio management on the investment performance of insurance companies. (Matsuda & Chen, 2024) adopting technology in investment management resulted in an average increase of 1.8% in risk-adjusted returns, alongside a 12% reduction in portfolio volatility.

Research Method

Research Design

This study uses a descriptive quantitative approach focusing on analysing the modified Du Pont decomposition for the insurance industry. The unit of analysis is insurance companies listed on the Indonesia Stock Exchange, with case studies on PT Asuransi Ramayana Tbk and PT Asuransi Jasa Tania Tbk for 2022-2023.

Data Sources and Data Collection Techniques

The data used in this study is secondary data, which includes:
1. Audited annual financial statements
2. Statement of financial position
3. Statement of profit and loss and other comprehensive income
4. Cash flow statement
5. Notes to the financial statements

All data were obtained from:
1. Official company websites
2. Indonesia Stock Exchange (www.idx.co.id)
3. Financial Services Authority (www.ojk.go.id)

Modified Du Pont Analysis Framework

The interpretation framework in this study is developed to provide a comprehensive understanding of the interrelationship among components in the modified Du Pont analysis. The interpretation process begins with evaluating performance, covering three fundamental aspects: operational effectiveness, asset utilisation efficiency, and capital structure optimisation. In evaluating operational effectiveness, the analysis focuses on the company's ability to manage underwriting and claims management, reflected in the combined ratio and loss ratio. Asset utilisation efficiency is assessed through asset turnover and investment yield analysis, offering insights into the company's ability to optimise its assets to generate revenue. Meanwhile, capital structure optimisation is evaluated through financial leverage and risk-based capital analysis, demonstrating how the company balances the use of its own capital and liabilities to support its operations.

The next step in the interpretation framework is identifying areas that require improvement based on performance gap analysis. Performance gaps are identified by comparing actual achievements with industry standards or internal company targets. This analysis allows the researcher to develop specific, measurable recommendations for optimising each ROE component. The recommendations take into account the unique characteristics of the insurance industry in Indonesia, including regulatory aspects, market dynamics, and consumer preferences.

The final stage of the interpretation framework is the formulation of a comprehensive strategy to improve ROE performance. The strategies developed encompass three main dimensions. First, profitability enhancement strategies focus on optimising underwriting and investment management. Second, risk and capital management strategies aimed at achieving an optimal balance between return and risk. Third are investment portfolio optimisation strategies considering regulatory constraints and the desired risk-return profile. This strategic formulation is based on an in-depth understanding of the relative contributions of each Du Pont component to ROE, enabling the development of recommendations that are not only effective but also implementable within the context of the Indonesian insurance industry.

Through this systematic interpretation framework, the research can generate valuable insights not only for insurance company management in optimising financial performance but

also for regulators in developing policies that support the sustainability of the insurance industry. This comprehensive interpretative approach allows for identifying key factors influencing ROE and the development of targeted strategies to improve the financial performance of insurance companies.

Analysis Stages

The analysis in this study is conducted through a series of systematic and structured stages, beginning with the calculation of basic ratios that form the foundation of the Du Pont analysis. This initial stage includes a comprehensive calculation of fundamental financial ratios, including profitability ratios to measure the company's ability to generate profit, efficiency ratios to evaluate the effectiveness of resource use, solvency ratios to assess the company's ability to meet its obligations, underwriting ratios to measure core insurance operational performance, and investment ratios to evaluate the effectiveness of investment portfolio management.

After the basic ratio calculations, the analysis proceeds to the Du Pont decomposition stage, which is carried out in a tiered manner. ROE is decomposed into its basic form at the first level, the ratio between net profit and total equity. It provides an initial overview of the company's effectiveness in generating shareholder returns. The second level of decomposition breaks down ROE into three main components: net profit margin, which measures profitability from revenue; asset turnover, which evaluates the efficiency of asset use; and financial leverage, which assesses the use of debt in the capital structure. The third level of decomposition integrates industry-specific components, such as underwriting ratios, investment yield, and risk management, offering a deeper understanding of the drivers of ROE performance in the context of the insurance industry.

The next stage is sensitivity analysis, designed to identify and measure the impact of changes in various components on overall ROE. In this stage, ROE's key drivers are identified through each component's relative contribution analysis. The elasticity of each component is measured to understand how sensitive ROE is to changes in that component. Simulations of various scenarios are performed to evaluate the potential impact of changes in key variables on ROE, helping develop more targeted optimisation strategies.

Each stage of the analysis is carried out considering the Indonesian insurance industry's specific context and the companies' unique characteristics being studied. Historical data is used to identify trends and patterns, while industry benchmarks serve as references for evaluating relative performance. The results of each analysis stage are integrated to provide a comprehensive understanding of the dynamics of ROE and the factors influencing it, forming the basis for developing strategic recommendations to improve the financial performance of insurance companies.

The methodology of this systematic analysis process enables a thorough evaluation of the financial performance of insurance companies and the identification of potential areas for optimisation. The step-by-step approach ensures that every aspect relevant to the formation of

ROE can be evaluated comprehensively, providing a solid foundation for strategic decision-making in insurance company financial management.

Data Analysis Techniques

This study implements a comprehensive data analysis technique to evaluate the decomposition of ROE through the modified Du Pont approach. Trend analysis serves as a fundamental step in the analysis process, where temporal changes in ROE components are evaluated through horizontal analysis to identify emerging patterns and trends from 2022 to 2023. This analysis provides a deep understanding of the structural changes in the financial performance of PT Asuransi Ramayana Tbk and PT Asuransi Jasa Tania Tbk. Simultaneously, vertical analysis is performed to understand the structure and composition of each financial component within the overall company performance, offering insights into the proportion and relative significance of various elements in forming ROE.

A comparative analysis is conducted in two dimensions to enrich the understanding of the companies' competitive position. The first dimension compares the performance of the companies being studied, identifying each entity's relative strengths and weaknesses. The second dimension involves benchmarking against the industry standards in the Indonesian insurance sector, providing a broader context regarding the companies' competitive positions within the industry. This comparative approach allows for identifying best practices and areas that require improvement in the context of industry competition.

Contribution analysis is a critical component of the data analysis technique, focusing on the systematic decomposition of each component's contribution to ROE. This methodology uses a mathematical approach to measure the sensitivity of ROE to changes in various contributing components. The analysis includes measuring the contribution of underwriting ratios, investment yield, operational efficiency, and financial leverage to the overall ROE. By analysing the factors that determine changes in ROE, the study can identify the main performance drivers and measure the elasticity of each component.

In its implementation, the data analysis technique integrates both quantitative methods and contextual analysis. Quantitative methods involve calculating and analysing financial ratios, trend analysis, and statistical measures to assess performance and the relationship between variables. Meanwhile, contextual analysis considers external factors such as macroeconomic conditions, regulatory changes, and industry dynamics that may influence the interpretation of quantitative analysis results. Integrating these two approaches allows for a more holistic understanding of the factors affecting ROE.

The data analysis process is supplemented by the use of analytical tools and statistical software to ensure the accuracy and reliability of the results. Data visualisation through graphs, charts, and dashboards is employed to facilitate interpreting results and communicating research findings. The analysis results are then validated through triangulation with historical data, industry benchmarks, and expert judgment to ensure the conclusions' robustness.

The entire data analysis technique is designed to provide a comprehensive understanding of the dynamics of ROE within the Indonesian insurance industry, offering a

strong basis for developing strategic recommendations for improving the financial performance of insurance companies. This systematic and structured analytical approach enables the identification of specific and measurable optimisation opportunities, supporting data-driven decision-making in the financial performance management of insurance companies.

Result

ROE Decomposition Analysis Using the Du Pont Method

Based on the financial statement analysis of PT Asuransi Ramayana Tbk and PT Asuransi Jasa Tania Tbk for the 2022-2023 period, the following ROE decomposition results were obtained:

Table 1. Dupont Analysis -ROE Component (%)

Company	Year	ROE	NPM	Asset TurnOver	Financial Leverage
Asuransi Ramayana	2022	14,08	3,93	1,35	2,65
Asuransi Ramayana	2023	13,08	4,17	1,15	2,73
Asuransi Jasa Tania	2022	0,18	0,35	0,33	1,57
Asuransi Jasa Tania	2023	1.24	2,11	0,38	1,54

Based on the ROE decomposition results above, there is a significant difference in the financial performance of the two insurance companies. PT Asuransi Ramayana Tbk showed a stronger ROE performance with a value of 13.08% in 2023, despite a slight decrease from 14.08% in 2022. This decline was primarily due to a decrease in asset turnover from 1.35x to 1.15x, although there was an increase in the net profit margin from 3.93% to 4.17%.

Meanwhile, PT Asuransi Jasa Tania Tbk improved ROE from 0.18% in 2022 to 1.24% in 2023. This improvement was mainly driven by a significant increase in the net profit margin from 0.35% to 2.11%, along with an improvement in asset turnover from 0.33x to 0.38x, despite a slight decrease in financial leverage from 1.57x to 1.54x.

Operational Component Analysis

Table 2. Key Operational Metrics (%)

Company	Year	Combined Ratio	Investment Yield	Expense Ratio
Asuransi Ramayana	2022	79,67	2,64	21,89
Asuransi Ramayana	2023	78,76	9,42	21,93
Asuransi Jasa Tania	2022	85,91	3,56	32,65
Asuransi Jasa Tania	2023	84,26	4,49	29,50

The operational component analysis shows a significant difference in efficiency between the two companies. PT Asuransi Ramayana Tbk demonstrated better operational efficiency with a lower combined ratio (78.76% in 2023) compared to PT Asuransi Jasa Tania Tbk (84.26%). A significant difference is also observed in investment yield, where PT Asuransi Ramayana Tbk recorded a substantial increase from 2.64% to 9.42%, while PT Asuransi Jasa Tania Tbk only recorded a moderate increase from 3.56% to 4.49%.

Contribution Analysis of ROE Components

The decomposition of each component's contribution to the change in ROE shows that:

PT Asuransi Ramayana Tbk:

- An increase in NPM contributed a positive 0.24 percentage points
- A decrease in asset turnover contributed a negative 1.48 percentage points
- An increase in financial leverage contributed a positive 0.24 percentage points
- Net effect: a decrease in ROE by 1.00 percentage points

PT Asuransi Jasa Tania Tbk:

- An increase in NPM contributed a positive 1.76 percentage points
- An increase in asset turnover contributed a positive 0.15 percentage points
- A decrease in financial leverage contributed a negative 0.85 percentage points
- Net effect: an increase in ROE by 1.06 percentage points

The analysis results show that both companies have different strategies and performance in achieving ROE. PT Asuransi Ramayana Tbk demonstrates strengths in operational efficiency and investment management, while PT Asuransi Jasa Tania Tbk shows significant improvement in profitability, although it still lags behind in scale and efficiency.

Discussion

This study yields several important findings regarding the decomposition of ROE in the Indonesian insurance industry. Implementing the modified Du Pont method reveals significant disparities in financial performance between PT Asuransi Ramayana Tbk and PT Asuransi Jasa Tania Tbk during the 2022-2023 period. A thorough analysis of the components that make up ROE uncovers several crucial insights that need to be discussed.

Operational Efficiency and Underwriting Performance

PT Asuransi Ramayana Tbk shows better operational efficiency with a combined ratio of 78.76% compared to PT Asuransi Jasa Tania Tbk (84.26%). (Wang & Zhang, 2022) revealed that a lower combined ratio indicates more effective claims and expense management. (Rahman et al., 2023) Added that companies with a combined ratio below 80% tend to exhibit better profitability stability in the long term.

Investment Management and Portfolio Performance

A significant difference is observed in investment performance, where PT Asuransi Ramayana Tbk recorded an increase in investment yield from 2.64% to 9.42%, while PT Asuransi Jasa Tania Tbk only achieved a moderate increase from 3.56% to 4.49%. (Matsuda & Chen, 2024) emphasise that the ability to optimise investment returns is becoming increasingly crucial amid financial market volatility. Portfolio diversification strategies and precise investment timing contribute to this performance difference.

Capital Structure and Financial Leverage

Leverage analysis shows different approaches in managing capital structure. PT Asuransi Ramayana Tbk operates with higher leverage (2.73x) compared to PT Asuransi Jasa Tania Tbk (1.54x). (Nakamura & Lee, 2024) identified that the optimal leverage level must consider the trade-off between potential return enhancement and regulatory risk. RBC regulation becomes an important constraint in optimising capital structure in this context.

Digitalisation and Operational Efficiency

Digital transformation has a significant impact on operational efficiency. (Rodriguez & Kim, 2024) found that companies with higher levels of digitalisation show a reduction in cost ratio by up to 15-20%. The implementation of automated underwriting and digital distribution channels contributes to the efficiency of acquisition costs and operational expenses. (Thomson et al., 2023) added that the integration of AI in the underwriting process improves risk assessment accuracy while reducing operational costs.

Risk Management and Regulatory Compliance

(Hassan & Wong, 2023) emphasised the importance of balancing return optimisation and regulatory compliance. This research confirms that companies with more effective risk management tend to show more stable ROE performance. (Yamamoto & Chen, 2023) added that implementing a robust risk management framework supports the sustainability of long-term profitability.

Market Positioning and Competitive Strategy

The analysis shows that market positioning affects revenue structure and profitability. (Chen & Wu, 2024) identified that product differentiation and proper market segmentation contribute to optimising underwriting margins. (Liu & Martinez, 2023) Emphasised the importance of adapting competitive strategies to consumer preferences and changes in market dynamics.

Implications for Industry Development

The findings of the research provide several important implications:

1. For insurance company management, the analysis results provide a framework for optimising ROE through more effective management of its constituent components.

2. For regulators, the insights gained can inform the development of policies that support the sustainability of the industry.
3. For investors, understanding the drivers of ROE aids in evaluating investments in the insurance sector.

Conclusion

This study yields several important conclusions regarding the determinants of ROE in the Indonesian insurance industry. Implementing the modified Du Pont method successfully identified three key factors influencing ROE performance: operational efficiency, investment management, and capital structure optimisation. These findings reinforce the theoretical framework developed by (Acharya & Singh, 2024) on the importance of a holistic approach in analysing insurance financial performance. Significant differences in ROE performance between the two companies studied indicate that success in the Indonesian insurance industry requires an optimal balance between ROE components. (Liu & Martinez, 2023) Emphasise that achieving sustainable ROE requires an integrated strategy considering the market's unique characteristics and regulations.

Digital transformation and strengthened regulations are creating new complexities in optimising ROE. (Chen & Wu, 2024) identify that insurance companies must adapt their strategies to accommodate fundamental changes in the business landscape. (Yamamoto & Chen, 2023) Additionally, success in the digital era requires recalibrating business models and adopting more sophisticated analytical approaches. These conclusions provide practical implications for insurance company management in optimising ROE performance and for regulators in developing policies that support industry sustainability. Future research could expand the analysis by integrating additional factors such as risk management quality and governance effectiveness into the modified Du Pont framework.

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