



THE IMPACT OF GEOPOLITICAL PRESSURE PROXIED BY AVTUR PRICES ON THE FINANCIAL PERFORMANCE OF AIRLINES LISTED ON THE INDONESIAN STOCK EXCHANGE: THE MEDIATION ROLE OF OPERATIONAL COSTS

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Abstract

This study analyzes the effect of geopolitical pressure in the energy market, proxied by aviation fuel prices, on the financial performance of airlines listed on the Indonesia Stock Exchange, with operating costs as a mediating variable. Financial performance is measured using Return on Equity (ROE). This research applies a quantitative associative-causal approach using quarterly panel data from 2022 to 2025 on two airline issuers, namely PT AirAsia Indonesia Tbk (CMPP) and PT Garuda Indonesia (Persero) Tbk (GIAA), resulting in 32 observations. Financial data were obtained from public financial reports, while aviation fuel price data were collected from official aviation fuel price sources. Aviation fuel prices and operating costs were transformed into natural logarithms to ensure proportional data scaling. The data were analyzed using linear regression, path analysis, and the Sobel test with SPSS 25. The results show that aviation fuel prices do not have a significant direct effect on ROE ($\beta = -0.054$; $t = -1.424$; $p = 0.165$). Aviation fuel prices have a positive and significant effect on operating costs ($\beta = 0.624$; $t = 3.386$; $p = 0.002$), while operating costs have a negative and significant effect on ROE ($\beta = -0.881$; $t = -2.452$; $p = 0.020$). Mediation testing indicates that operating costs fully mediate the effect of aviation fuel prices on ROE (indirect effect = -0.550 ; Sobel $t = -4.92$). These findings indicate that the impact of geopolitical pressure on airline profitability primarily occurs through increased operating costs. The study implies the importance of cost efficiency, fuel consumption management, and mitigation strategies against aviation fuel price volatility.

Keywords: aviation fuel price; operating costs; financial performance; ROE; airlines

INTRODUCTION

The aviation industry is one of the most sensitive sectors to energy price fluctuations, as aviation fuel (avtur) is a key component of airlines' operating costs. Following the post-pandemic recovery period, airlines face new challenges in the form of energy price volatility influenced by global geopolitical tensions, such as the Russia-Ukraine war, tensions in the Middle East, and disruptions to the international energy supply chain. These conditions have the potential to increase aviation fuel prices and put pressure on airlines' ability to maintain profitability.

For Indonesian airlines, rising aviation fuel prices not only increase fuel costs but also impact operational decisions, such as adjusting flight frequencies, routes, ticket pricing policies, fleet efficiency, and other cost controls. From a financial management perspective, changes in operational costs are ultimately reflected in profitability ratios, one of which is Return on Equity (ROE). This ratio illustrates a company's ability to generate net profit on its equity.

This research problem is important because the financial performance of airlines listed on the Indonesia Stock Exchange during the 2022-2025 period showed a fluctuating trend. At the same time, domestic aviation fuel prices and airline operating costs showed an upward trend. This phenomenon indicates that external shocks do not always directly reduce financial performance but can operate through internal company mechanisms, particularly increased operating costs.

Previous research on the relationship between geopolitical risk and financial performance remains inconsistent. Some studies found that geopolitical risk significantly impacts corporate financial performance (Lydia et al., 2024; Payung et al., 2024), while others indicate that geopolitical conflict does not always result in significant differences or direct impacts on financial performance (Juli & Yanto, 2025; Ratna Kurniawati & Listyowati, 2021). These differing results demonstrate the need for intermediary variables capable of explaining the transmission pathways of geopolitical influence on financial performance.

This research gap lies in the limited number of studies examining operational costs as a mediating variable between geopolitical pressures, as proxied by aviation fuel prices, and the financial performance of Indonesian airlines. While some previous studies have identified geopolitical risk as a variable that directly influences performance, research on operational cost mediation has largely focused on non-aviation sectors, such as electricity (Fadila et al., 2025; Riwang et al., 2024). Therefore, this study offers a novel approach by positioning operational costs as the primary transmission channel within the Indonesian Stock Exchange-listed airline subsector.

Based on this background, this study aims to: (1) analyze the effect of aviation fuel prices as a proxy for geopolitical pressure on financial performance; (2) analyze the effect of aviation fuel prices on operational costs; (3) analyze the effect of operational costs on financial performance; and (4) analyze the mediating role of operational costs in the relationship between aviation fuel prices and the financial performance of airlines listed on the IDX for the 2022-2025 period.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Financial Performance and Return on Equity

Financial performance reflects a company's ability to manage resources to generate profits, maintain liquidity, maintain capital structure, and create shareholder value. In financial management research, financial performance is often measured through profitability ratios because these ratios indicate a company's effectiveness in generating profits from its resources (Indriakati et al., 2022).

Return on Equity (ROE) is used as a financial performance indicator because it measures a company's ability to generate net profit from its equity. A high ROE indicates a company's ability to utilize its equity effectively, while a low ROE indicates a company's limitations in generating profits for shareholders (Putri et al., 2021). In the aviation industry, ROE is heavily influenced by cost structure, fleet utilization rate, passenger volume, exchange rates, and fuel prices.

Geopolitical Pressure and Avtur Prices

Geopolitical conflict or tension is a form of global uncertainty that can impact trade, supply chains, commodity prices, exchange rates, and energy market stability. In the aviation context, geopolitical impacts are most easily observed through changes in aviation fuel prices, as aviation fuel

is derived from petroleum products, which are sensitive to supply disruptions and changes in global oil prices.

This study uses aviation fuel prices as a proxy for geopolitical pressure on the energy market. The proxy was chosen based on the direct relevance between aviation fuel prices and airline cost structures. However, this variable requires careful interpretation, as aviation fuel prices are influenced not only by geopolitical conflicts but also by exchange rates, pricing policies, domestic distribution, taxes, and fuel demand dynamics. Therefore, the term used in this study is geopolitical pressure, as proxied by aviation fuel prices, rather than geopolitical conflict as a single political event.

Operational Costs as a Mediating Variable

Operating costs are the total economic sacrifices a company incurs to carry out its core activities, such as fuel, maintenance, aircraft rental, labor, airport services, navigation, and other operational support costs (Mulyadi, 2021). For airlines, operating costs play a strategic role because even small changes in fuel prices can significantly impact total costs.

Operating costs are positioned as a mediating variable because geopolitical pressures, reflected in rising aviation fuel prices, first increase airline operating expenses, which then depress profits and ROE. Thus, operating costs can explain why geopolitical influences on financial performance are not always directly apparent but emerge through the cost channel.

Previous Research

A summary of previous research is presented in Table 1 to indicate the position of this research in the literature and clarify the research gap it fills.

Table 1. Summary of Previous Research and Research Position

Researchers	Focus Variable	Key Findings	Differences with This Research
Lydia et al. (2024)	Geopolitical risk, company size, financial performance	Geopolitical risks impact financial performance in certain contexts.	Not yet tested operational costs as a mediator in the aviation sector.
Juli & Yanto (2025).	Gaza war and financial performance	Some performance indicators did not differ significantly before and after the conflict.	The objects and contexts are different and do not use a mediation model.
Ratna Kurniawati & Listyowati (2021)	Airline financial performance during the pandemic	Airline financial performance does not always differ significantly during periods of crisis.	Comparative approach, not a test of cost mediation paths.
Riwang et al. (2024)	Operating costs and financial performance	Operational costs affect financial performance.	The object is the electricity sector, not the airlines.
Fadila et al. (2025)	Geopolitical conflicts, operational costs, and	Operational costs mediate the relationship between	Non-aviation sector objects; this study

	financial performance	geopolitical conflict and financial performance.	examines airline issuers.
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Conceptual Framework and Hypothesis

This research's conceptual framework explains that aviation fuel prices, as a proxy for geopolitical pressure, can directly and indirectly impact ROE through operational costs. Operational costs are estimated to be the primary channel, as increases in aviation fuel prices first increase total costs and then decrease profitability.



Figure 1. Conceptual Framework of the Research

H1: Avtur prices, as a proxy for geopolitical pressure, affect airline financial performance.

H2: Avtur prices, as a proxy for geopolitical pressure, have a positive effect on airline operational costs.

H3: Operational costs hurt airline financial performance.

H4: Operational costs mediate the effect of aviation fuel prices on airline financial performance.

METHOD

Types and Approaches of Research

This study uses a quantitative approach with a causal associative approach. The quantitative approach is used because the study examines the relationship between variables based on numerical data. In contrast, the causal associative approach is used to explain the effect of aviation fuel prices on financial performance, both directly and through operational costs as a mediating variable.

Population, Sample, and Unit of Analysis

The study population consisted of airline companies listed on the Indonesia Stock Exchange during the 2022-2025 period. The sample was selected using a purposive sampling technique based on the following criteria: (1) the company was listed on the IDX during the observation period; (2) published accessible financial reports; (3) had relevant data for calculating ROE and operational costs; and (4) had operational characteristics directly related to aviation fuel consumption. Based on these criteria, the study sample consisted of PT AirAsia Indonesia Tbk (CMPP) and PT Garuda Indonesia (Persero) Tbk (GIAA). The unit of analysis used company-quarter data for the 2022-2025 period, resulting in 32 observations (2 companies x 16 quarters).

Data Collection Sources and Techniques

The research data is secondary. Financial performance and operational cost data were obtained from issuers' public financial reports through the Indonesia Stock Exchange and/or their official websites. Aviation fuel price data were obtained from official aviation fuel price sources and then adjusted for quarterly periods. Data collection was conducted through documentation, namely tracing, recording, and processing numerical data from financial reports and relevant aviation fuel price sources.

Operational Definition of Variables

Table 2. Operational Definition of Variables

Variables	Operational Definition	Indicator/Formula	Scale
Financial Performance (Y)	The company's ability to generate returns on its own capital.	$ROE = \text{Net profit after tax} / \text{Total equity} \times 100\%$	Ratio
Geopolitical Pressure (X)	Changes in aviation fuel prices reflect pressure on the energy market.	$LN_AVTUR = \text{natural log of avtur price (Rp/liter)}$	Ratio
Operating Costs (Z)	Total operational costs incurred by the airline in carrying out its main activities.	$LN_BO = \text{natural log of total operating costs/burdens}$	Ratio

Data Analysis Techniques

Data analysis was performed using descriptive and inferential statistics. Descriptive statistics were used to explain the minimum, maximum, mean, and standard deviation values of each variable. Inferential statistics were used to test hypotheses through linear regression and path analysis.

Before hypothesis testing, classical assumption tests were conducted, including tests for normality, multicollinearity, heteroscedasticity, linearity, and autocorrelation. Hypothesis testing was conducted using three structural equations as follows:

$$ROE = \alpha + c LN_AVTUR + \varepsilon_1$$

$$LN_BO = \alpha + a LN_AVTUR + \varepsilon_2$$

$$ROE = \alpha + c' LN_AVTUR + b LN_BO + \varepsilon_3$$

Description: c is the direct effect of aviation fuel prices on ROE; a is the effect of aviation fuel prices on operational costs; b is the effect of operational costs on ROE after controlling for aviation fuel prices; and axb is the indirect effect. Mediation testing is conducted using path analysis and the Sobel test. If the direct effect is insignificant while the indirect effect is significant, then operational costs are declared as a full mediator.

RESULTS AND DISCUSSION

Descriptive Statistics

Table 3. Descriptive Statistics of Research Variables (N = 32)

Variables	Minimum	Maximum	Mean	Standard Deviation
ROE (%)	0.0030	17,0050	0.6333	3,0018
LN_AVTUR	9,3040	9,8040	9,6188	0.1373
LN_BO	27,3010	29,8000	28,9644	0.6851

Table 3 shows that ROE has a standard deviation greater than the mean, indicating that airline financial performance fluctuated relatively during the observation period. This is normal in the aviation industry, as demand recovery rates, fleet utilization, cost structures, and changes in fuel costs heavily influence profitability.

The LN_AVTUR and LN_BO variables have smaller standard deviations than their mean values. This indicates that aviation fuel prices and operating costs fluctuated relatively consistently throughout the study period. Although the variations were not statistically extreme, increases in operating costs remain significant as they can erode profit margins and lower ROE.

Classical Assumption Test

The results of the Kolmogorov-Smirnov normality test on the substructural model showed an Asymp. Sig. Sig. Sig. value above 0.05, so the residuals were declared normally distributed. The multicollinearity test showed a tolerance value of 0.723 (> 0.10) and a VIF of 1.382 (< 10), so there were no symptoms of multicollinearity between the independent variables.

The heteroscedasticity test using the Glejser method showed a significance value above 0.05, indicating that the model does not contain heteroscedasticity issues. The linearity test showed a deviation from linearity value above 0.05, indicating that the relationship between the variables meets the linearity assumption. The Durbin-Watson test yielded values within the acceptable range, indicating that the model does not indicate serious autocorrelation. Thus, the regression model is suitable for hypothesis testing.

Regression Results and Hypothesis Testing

Table 4. Summary of Regression Results

Variable Relationship	Coefficient (β)	t-count	Sig.	R ²	Decision
LN_AVTUR -> ROE	-0.054	-1,424	0.165	0.063	H1 is rejected
LN_AVTUR -> LN_BO	0.624	3,386	0.002	0.277	H2 accepted
LN_BO -> ROE (LN_AVTUR control)	-0.881	-2,452	0.020	0.070	H3 is accepted

The results of the first hypothesis test indicate that LN_AVTUR does not have a significant direct effect on ROE. The negative coefficient value indicates a direction of the relationship consistent with the assumption, but the significance value of 0.165 is greater than 0.05, so H1 is rejected. This finding indicates that the increase in aviation fuel prices does not immediately reduce ROE because airlines can still make strategic adjustments, such as route efficiency, tariff adjustments, optimization of additional revenue, or other cost controls.

The results of the second hypothesis test indicate that LN_AVTUR has a significant positive effect on LN_BO. A coefficient of 0.624 and a significance level of 0.002 indicate that increases in aviation fuel prices increase airline operating costs. This finding is consistent with the aviation industry's highly fuel-dependent nature, making aviation fuel price volatility a significant source of cost pressure.

The results of the third hypothesis test indicate that LN_BO has a significant negative effect on ROE. A coefficient of -0.881 indicates that increasing operating costs decreases financial performance. From a managerial perspective, these results confirm that operational cost efficiency is a key factor in maintaining airline profitability, especially when fuel prices are high.

Path Analysis and Mediation Test

Table 5. Results of Path and Mediation Analysis

Influence Components	Mark	Interpretation
Direct effect (c'): LN_AVTUR -> ROE	-0.017	Not significant
Influence a: LN_AVTUR -> LN_BO	0.624	Significant positive
Influence b: LN_BO -> ROE	-0.881	Significant negative
Indirect influence (axb)	-0.550	Significant
Total influence	-0.567	The direction of the total influence is negative
Sobel test	-4.92	Absolutely significant at the 5% level

The path analysis results show that the indirect effect of LN_AVTUR on ROE through LN_BO is -0.550, greater than the direct effect of -0.017. The Sobel t-value of -4.92 indicates that the indirect effect is statistically significant. Thus, H4 is accepted.

Because the direct effect of aviation fuel prices on ROE is insignificant, while the indirect effect through operating costs is significant, operating costs can be categorized as a full mediator. This means that aviation fuel prices, as a proxy for geopolitical pressure, do not directly reduce financial performance but first increase operating costs, which then depresses ROE.

This finding clarifies previous research that found no direct impact of geopolitical conflict on financial performance. In the airline context, geopolitical pressure is better understood as an external factor that influences cost structure, not as a factor that automatically and directly changes profitability.

Discussion and Research Contribution

Theoretically, this research contributes by strengthening the importance of mediation models in explaining the relationship between external macro variables and corporate financial performance. Direct testing alone can yield incomplete conclusions because external impacts often operate through internal mechanisms, such as increased operating costs.

Practically, the research results indicate that airline management needs to prioritize cost control strategies. Strategies that can be considered include fuel consumption planning, route optimization, load factor improvement, fleet efficiency, operational contract renegotiation, and fuel price risk mitigation. If company policies focus solely on increasing revenue without controlling operational costs, aviation fuel price pressures will continue to reduce profitability.

From a policy perspective, the research findings demonstrate the need for regulators to pay attention to tariff adjustment mechanisms and fuel cost policies in the aviation industry. Adaptive policies to aviation fuel price volatility can help maintain airline business sustainability while protecting consumer purchasing power.

CONCLUSIONS

Based on the analysis, this study concludes that aviation fuel prices, as a proxy for geopolitical pressure, did not have a significant direct impact on the ROE of airlines listed on the IDX for the 2022-2025 period. This indicates that aviation fuel price fluctuations are not always directly reflected in financial performance, as companies can adjust their operations and business policies.

Aviation fuel prices have a significant positive impact on operating costs. The higher the price, the greater the operational burden an airline must bear. Furthermore, operating costs have a significant negative impact on ROE. Increased operating costs depress net income and reduce the company's ability to generate returns on equity. Operating costs have been shown to mediate the effect of aviation fuel prices on ROE fully. Thus, the impact of geopolitical pressures on airline profitability occurs primarily through increased operating costs, rather than through a direct impact on financial performance.

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