

FINANCIAL EVALUATION OF AIRCRAFT ACQUISITION ALTERNATIVES: LEASE VERSUS BUY DECISION FOR GARUDA INDONESIA'S BOEING 737 MAX

Richlah Nia, Sylviana Maya Damayanti

School of Business and Management, Institut Teknologi Bandung, Jakarta, Indonesia

E-mail: richlahnia22@gmail.com ; sylvianamaya@itb.ac.id

Received: 01/06/2026 | Revised: 07/06/2026 | Accepted: 21/06/2026 | Published: 29/06/2026

Abstract

This study evaluates aircraft acquisition alternatives for Garuda Indonesia's Boeing 737 MAX procurement by comparing direct purchase, sale and leaseback, operating lease, and financial lease structures. The analysis is motivated by Garuda Indonesia's post restructuring condition, fleet readiness constraints, aircraft redelivery obligations, and the need to renew its aging narrow body fleet. A discounted cash flow model is used to calculate Net Present Value (NPV), supported by Net Advantage to Leasing (NAL), SWOT analysis, and sensitivity analysis. The base case result shows that leasing-based alternatives provide stronger financial value, with financial lease recording the highest result among all acquisition alternatives. Direct purchase records an NPV of USD 38.569 million and is used as the benchmark. Sale and leaseback records an NPV of USD 44.041 million, operating lease records USD 47.920 million, and financial lease records the highest NPV of USD 48.047 million. Financial lease also generates the highest NAL NPV of USD 9.478 million. The sensitivity analysis indicates that financial lease remains the strongest alternative in most scenarios, although the result is sensitive to WACC, residual value, and monthly base rent assumptions.

Keywords: aircraft acquisition; Boeing 737 MAX; discounted cash flow; financial lease; lease versus buy.

INTRODUCTION

The aviation industry is a capital intensive sector in which fleet planning decisions directly affect capacity, cost structure, liquidity, and long term competitiveness. Aircraft procurement requires large financial commitments, while airline revenues are exposed to market demand, fuel price volatility, exchange rate movement, and aircraft availability. For airlines in a recovery phase, the choice of aircraft acquisition method becomes an important strategic and financial decision because it determines not only the timing of fleet renewal but also the pattern of cash flow obligations over the aircraft life cycle. Indonesia's aviation market has entered a recovery period after the COVID-19 pandemic. Based on Indonesia Airport Authority and IATA data, domestic and international traffic are projected to return to the 2019 level by 2026 and to reach approximately 2.5 times the pre pandemic traffic level by 2035. This recovery creates an opportunity for Garuda Indonesia to restore capacity and improve market position. At the same time, the company must address operational constraints related to fleet readiness and the replacement of aging aircraft.

Garuda Indonesia Group operated 142 aircraft by the end of 2025, consisting of 78 Garuda Indonesia aircraft and 64 Citilink aircraft. Of the total fleet, 44 aircraft were unserviceable, equal to around 31 percent of the group fleet. Garuda Indonesia also faces redelivery obligations for leased aircraft and an aging Boeing 737-800NG fleet, which has been operated as the main narrow body aircraft type since 2005. These conditions create a need for narrow body fleet renewal to support domestic and regional routes, improve operational reliability, and reduce long term maintenance and fuel cost pressure. The Boeing 737 MAX is considered relevant for this fleet renewal strategy because it offers improved fuel efficiency, lower emissions, longer range, and better operating economics compared to the previous 737NG generation. Boeing states that the 737 MAX family can reduce fuel use and emissions by up to approximately 20 percent compared with the aircraft it replaces. However, acquiring new generation aircraft

requires disciplined capital allocation, particularly because Garuda remains in a post restructuring recovery phase and must maintain financial sustainability.

Aircraft acquisition can be structured through direct purchase, operating lease, financial lease, or sale and leaseback. Each alternative has different implications for ownership, upfront cash requirement, financing cost, lease payment obligation, residual value exposure, and fleet flexibility. This study therefore evaluates the financial feasibility of these four acquisition alternatives for one Boeing 737 MAX aircraft and identifies the most attractive structure for Garuda Indonesia under the assumptions used in the model.

LITERATURE REVIEW

Aircraft acquisition decisions are closely related to airline financing strategy. Airlines typically acquire aircraft through purchase or leasing. Purchase structures provide ownership and asset control, while leasing allows airlines to use aircraft without making the full purchase payment at the beginning of the arrangement. Aircraft financing literature emphasizes that the lease versus buy decision should be assessed by considering cash flow timing, residual value risk, capital availability, fleet flexibility, and long term cost efficiency rather than acquisition price alone (Bunker, 2005; Doganis, 2010; Vasigh et al., 2020). Direct purchase gives the airline full ownership from delivery. This structure provides greater control over utilization, configuration, maintenance planning, and disposal. It also allows the airline to receive residual value at the end of the ownership period. The main limitation is the large upfront capital requirement and the airline's exposure to residual value risk. Direct purchase may be attractive when the airline has strong financial capacity and intends to use the aircraft over a long period, but it can create liquidity pressure for airlines with constrained cash flow. Operating lease is a structure in which the airline obtains the right to use the aircraft for a specified period, while legal ownership remains with the lessor. This structure is commonly used to preserve liquidity, support capacity adjustment, and transfer residual value risk to the lessor. The lessee remains responsible for lease payments, return conditions, and redelivery obligations. Operating lease provides higher fleet flexibility, but it does not provide ownership benefits and may result in higher accumulated lease cost over a long period (IATA, 2025b; Vasigh et al., 2020).

Financial lease is closer to a long term financing arrangement. The airline receives the economic benefits of using the aircraft and makes scheduled payments that can be separated into principal and interest components. This structure may provide stronger asset control and economic ownership benefits, including residual value potential, but it also creates long term financing commitments and higher exposure to interest rate and residual value assumptions. In aircraft financing practice, financial lease is generally more suitable when the airline expects long term aircraft use and prioritizes fleet stability over short term flexibility. Sale and leaseback is a structure in which an airline sells an aircraft, or the right to purchase an aircraft, to a lessor and then leases back the same aircraft for continued operation. This structure can release capital tied to the asset and improve short term liquidity, while allowing the airline to continue operating the aircraft. The trade off is that the airline gives up ownership related benefits and becomes bound by leaseback terms, lease payment obligations, and redelivery requirements (Dentons Link Legal, 2022; IATA, 2025b).

From an accounting perspective, IFRS 16 and PSAK 116 require most leases to be recognized through right of use assets and lease liabilities. This affects financial statement presentation, but it does not change the total contractual cash flow used in discounted cash flow analysis. From a tax perspective, lease treatment follows applicable tax regulations rather than PSAK 116 alone. This study separates accounting recognition, tax treatment, and economic cash flow analysis to ensure that the lease versus buy comparison is based on the actual economic implications of each structure. Capital budgeting provides the framework for evaluating long term aircraft acquisition decisions. The discounted cash flow method converts future cash flows into present value using a discount rate that reflects the cost of capital. Net Present Value is widely used because it captures the time value of money and allows alternatives with different payment patterns to be compared on a consistent basis (Brealey, Myers, & Allen, 2020; Damodaran, 2012). In lease versus buy decisions, Net Advantage to Leasing can also be used to measure the incremental financial benefit of a leasing alternative relative to direct purchase.

Table 1. Comparison of Aircraft Acquisition Alternatives

Alternative	Ownership and Payment Structure	Main Strategic Implication
Direct purchase	Airline owns the aircraft from delivery and pays PDP, final aircraft price, financing cost, and operating cost.	Provides full asset control and residual value benefit, but requires the highest upfront capital commitment.
Sale and leaseback	Aircraft is sold to a lessor and leased back for continued operation through periodic lease payments.	Improves short term liquidity, but reduces ownership benefits and creates future lease obligations.
Operating lease	Lessor retains legal ownership while the airline pays rental, security deposit, and maintenance reserve where applicable.	Provides fleet flexibility and transfers most residual value risk, but does not provide ownership benefit.
Financial lease	Airline makes scheduled financing payments consisting of principal and interest components and receives economic ownership benefits.	Combines structured financing, stronger asset control, and residual value potential, but creates long term obligations.

METHOD

This study applies an applied case study approach using Garuda Indonesia as the subject of analysis. The research combines quantitative financial evaluation with qualitative strategic considerations. The quantitative analysis is used to compare the financial feasibility of four acquisition alternatives for one Boeing 737 MAX aircraft, while the qualitative analysis supports the interpretation of the results through SWOT analysis. The data used in the study are secondary data obtained from Garuda Indonesia annual reports, aircraft pricing and technical references, aircraft leasing market references, aircraft appraisal data, and aviation finance literature. The main inputs include aircraft acquisition cost, pre delivery payment structure, monthly lease rate, maintenance reserve, security deposit, residual value, financing cost, tax rate, and discount rate. The model uses a Boeing 737 MAX final escalated price of USD 55.0 million, total PDP of 15 percent, monthly operating lease base rent of USD 450,000, financial lease monthly principal and interest payment of USD 438,982, residual value of USD 21.0 million, and WACC of 9.44 percent. The financial model is constructed using the discounted cash flow method. Cash inflows and outflows are projected over the evaluation period and discounted to present value using WACC. Common operating costs, including commission and reservation, passenger service cost, fuel cost, personnel cost, minor maintenance, and insurance, are assumed to be the same across all acquisition alternatives. This assumption allows the comparison to focus on the financial impact of acquisition structure rather than operational differences.

The direct purchase cash flow includes pre delivery payments, final aircraft purchase payment, financing payments where applicable, major maintenance or overhaul cost, depreciation tax shield, residual value, and tax on sale of aircraft. The sale and leaseback cash flow includes PDP, security deposit, maintenance reserve, lease rent, sale proceeds or PDP return, refundable amounts, tax shield on lease payments, and tax effects related to maintenance reserve. The operating lease cash flow includes maintenance reserve, commitment fee, security deposit, lease rent, refundable amounts, and tax shield on rental payments. The financial lease cash flow includes PDP, scheduled lease payment, principal repayment, interest expense, major maintenance or overhaul cost, residual value, tax shield on depreciation, tax shield on interest, and tax on sale of aircraft. NPV is calculated by discounting the net cash flow of each alternative. The general formulation is $NPV = \sum C Ft / (1 + WACC)^t$, where $C Ft$ represents the net cash flow in period t . The acquisition alternative with the highest NPV is considered the most financially attractive under the model assumptions. NAL is calculated as NPV of leasing alternative minus NPV of direct purchase. A positive NAL indicates that the leasing alternative provides higher financial value than the purchase benchmark. Sensitivity analysis is conducted by changing one selected variable at a time while keeping other assumptions constant. The variables tested are exchange rate, fuel price, WACC, residual value, and monthly base rent. These variables are selected because they directly affect cash flow conversion, operating cost assumptions, discounting factor, terminal value, and lease payment obligations.

RESULTS AND DISCUSSION

Base Case Financial Evaluation

FINANCIAL EVALUATION OF AIRCRAFT ACQUISITION ALTERNATIVES: LEASE VERSUS BUY DECISION FOR GARUDA INDONESIA'S BOEING 737 MAX

Richlah Nia et al

The base case financial evaluation compares the nominal value, NPV, and NAL NPV of direct purchase, sale and leaseback, operating lease, and financial lease. Direct purchase is used as the benchmark because it represents the aircraft ownership alternative. The results are summarized in Table 2.

Table 2. DCF Calculation Results Using NPV (in thousand USD)

Alternative	Direct Purchase	Sale and Leaseback	Operating Lease	Financial Lease
NPV	38,569	44,041	47,920	48,047
NAL NPV	Baseline	5,472	9,351	9,478

The result shows that all leasing based alternatives provide higher financial value than direct purchase. Direct purchase generates an NPV of USD 38.569 million and is used as the benchmark. Sale and leaseback generates an NPV of USD 44.041 million with an NAL NPV of USD 5.472 million. Operating lease generates an NPV of USD 47.920 million with an NAL NPV of USD 9.351 million. Financial lease generates the highest NPV of USD 48.047 million and the highest NAL NPV of USD 9.478 million. Direct purchase provides full ownership and residual value benefit, but it requires higher upfront funding through pre delivery payments and final aircraft purchase payment. This creates liquidity pressure and exposes the airline to residual value risk. In a post restructuring condition, this structure is less attractive because the financial burden is concentrated earlier in the aircraft life cycle. Sale and leaseback provides higher value than direct purchase because it allows cash inflow from the sale transaction while the aircraft remains available for operation. This structure can support liquidity management, but the airline must accept future lease obligations and the loss of direct residual value benefit. The result indicates that sale and leaseback is financially better than direct purchase, but it is less attractive than operating lease and financial lease under the base case assumptions.

Operating lease provides a strong result because it requires lower initial cash outflow and transfers most residual value risk to the lessor. It also gives Garuda greater fleet flexibility, which is useful in a market environment with demand uncertainty and aircraft availability constraints. Its limitation is the absence of ownership benefits and limited control over the aircraft at the end of the lease period. Financial lease provides the strongest base case result. The structure combines scheduled long term financing, asset control, depreciation and interest tax benefits, and economic ownership benefits through terminal residual value. The difference between financial lease and operating lease is relatively small, with financial lease only USD 0.128 million higher in NPV. This narrow difference means that the final decision should be validated against updated financing terms, aircraft appraisal values, lease market conditions, and actual commercial offers.

Strategic Interpretation

The SWOT assessment supports the financial evaluation. Direct purchase has the strongest ownership control but requires the highest capital commitment. Sale and leaseback supports capital recycling and short term liquidity, but it creates future lease obligations and redelivery requirements. Operating lease provides the highest fleet flexibility and reduces residual value risk, but it does not provide ownership benefit. Financial lease provides a more balanced position by combining financing structure, asset control, and economic ownership benefit. For Garuda Indonesia, the financial lease alternative is aligned with the need to renew the narrow body fleet while maintaining cash flow discipline. The aircraft procurement decision must support capacity recovery and domestic route competitiveness without creating excessive liquidity pressure. Financial lease allows the company to spread aircraft acquisition cost over the financing period while still maintaining stronger control over the asset than operating lease.

Sensitivity Analysis

Sensitivity analysis is used to examine whether the ranking of alternatives changes when key assumptions move against the base case. The findings are summarized in Table 3.

Table 3. Summary of Sensitivity Analysis

Variable	Main Finding	Implication
Exchange rate	Financial lease remains the highest NPV under all exchange rate scenarios tested.	Ranking is stable, but weaker Rupiah reduces NPV across all alternatives.
Fuel price	Higher fuel price reduces NPV for all alternatives because fuel cost is common across structures.	Financial lease remains strongest; direct purchase reaches break even earlier under severe fuel pressure.
WACC	Operating lease becomes slightly higher than financial lease when WACC increases to 9.72%.	Financial lease is sensitive to discount rate because it includes long term cash flows and terminal value.
Residual value	Operating lease becomes higher than financial lease when residual value decreases to USD 20.0 million or USD 19.0 million.	Residual value risk should be reviewed carefully before selecting a financial lease structure.
Monthly base rent	Operating lease becomes more attractive when monthly base rent declines below the base case.	Actual market lease offers may affect the final recommendation.

The exchange rate sensitivity shows that Rupiah depreciation reduces the NPV of all alternatives. This occurs because several cash flow components are denominated in United States dollars and become more expensive when translated into the model currency. Under all exchange rate scenarios tested, financial lease remains the strongest alternative, followed closely by operating lease. It should be noted that this analysis only isolates the direct impact of exchange rate movement on the projected cash flows. The analysis does not incorporate potential indirect effects from changes in the risk free rate, inflation, interest rates, or other macroeconomic variables that may also change as a result of exchange rate movements. The fuel price sensitivity affects all alternatives because fuel cost is treated as a common operating cost. Higher fuel prices reduce NPV across all alternatives, while lower fuel prices improve the results. Since the fuel cost assumption is applied consistently across all structures, the relative ranking does not materially change. The analysis also shows that direct purchase becomes financially unattractive earlier than the leasing based alternatives under severe fuel price pressure.

The WACC sensitivity shows that the result is more sensitive when the discount rate changes. At the base case WACC of 9.44 percent, financial lease generates the highest NPV. When WACC increases to 9.72 percent, operating lease becomes slightly higher than financial lease. This indicates that the preference for financial lease depends partly on the stability of the discount rate and the valuation of long term terminal benefits. The residual value sensitivity mainly affects direct purchase and financial lease because both structures include terminal residual value. When residual value decreases, the financial lease advantage over operating lease narrows and eventually reverses. This confirms that residual value appraisal is one of the most important inputs in validating the final acquisition decision. The monthly base rent sensitivity affects operating lease and sale and leaseback. When monthly base rent decreases, operating lease becomes more competitive and may exceed financial lease. This finding shows that actual lease market offers may change the final decision even when the base case indicates financial lease as the preferred structure. For this reason, the recommendation should not rely only on the base case calculation.

CONCLUSION

This study evaluates four Boeing 737 MAX acquisition alternatives for Garuda Indonesia using discounted cash flow, NPV, NAL, SWOT analysis, and sensitivity analysis. The results show that all leasing based alternatives generate higher financial value than direct purchase. Direct purchase records an NPV of USD 38.569 million and is used as the benchmark. Sale and leaseback records an NPV of USD 44.041 million with an NAL NPV of USD 5.472 million. Operating lease records an NPV of USD 47.920 million with an NAL NPV of USD 9.351 million. Financial lease records the highest NPV of USD 48.047 million and the highest NAL NPV of USD 9.478 million. Based on the base case assumptions, financial lease is the most financially attractive acquisition alternative. This structure is

relevant for Garuda because it supports fleet renewal while spreading aircraft acquisition cost over time and maintaining economic ownership benefits. It also provides a more balanced position than direct purchase, sale and leaseback, and operating lease by combining structured financing, stronger asset control, and terminal residual value potential. The sensitivity analysis shows that financial lease remains the strongest alternative in most scenarios, especially under exchange rate and fuel price changes. The result is sensitive to WACC, residual value, and monthly base rent assumptions. Operating lease becomes more competitive when WACC increases, residual value decreases, or monthly base rent declines. This means that the final acquisition decision should be validated against updated commercial offers, financing terms, aircraft appraisal values, and lease market conditions. Garuda Indonesia is recommended to prioritize financial lease as the main acquisition direction for the Boeing 737 MAX. Before implementation, the company should conduct market sounding or a Request for Proposal process to compare financing rate, lease tenor, repayment profile, residual value treatment, security deposit, maintenance obligation, and purchase option mechanism. Future evaluation should update the model regularly using current fuel price assumptions, exchange rate projections, financing costs, aircraft appraisal data, lease market conditions, and route deployment plans.

REFERENCES

- Ackert, S. P. (2011). The relationship between an aircraft's value and its maintenance status. *Aircraft Monitor*. AVITAS. (n.d.). Aircraft appraisal and valuation reference material. AVITAS.
- Boeing. (2024a). Boeing 737 MAX family: Technical specifications and market information. The Boeing Company.
- Boeing. (2024b). Commercial Aircraft Finance Market Outlook 2024. The Boeing Company.
- Brealey, R. A., Myers, S. C., & Allen, F. (2020). Principles of corporate finance. McGraw-Hill Education.
- Bunker, J. (2005). Aircraft financing. Euromoney Books.
- Cirium Ascend. (2026). Boeing 737 MAX aircraft market lease rate and residual value data. Cirium Ascend database.
- Clark, P. (2007). Buying the big jets: Fleet planning for airlines. Ashgate Publishing.
- Damodaran, A. (2012). Investment valuation: Tools and techniques for determining the value of any asset. John Wiley & Sons.
- Damodaran, A. (2026). Country default spreads and risk premiums. Stern School of Business, New York University.
- Dentons Link Legal. (2022). Handbook on aircraft leasing. Dentons Link Legal.
- Doganis, R. (2010). Flying off course: Airline economics and marketing. Routledge.
- Gibson, W. E. (2010). Aircraft financing and leasing: Tools for success in international aircraft acquisition. Aviation Supplies & Academics.
- IATA. (2023). Aircraft finance report. International Air Transport Association.
- IATA. (2024). World commercial fleet by type of ownership. IATA Sustainability and Economics, based on Cirium data.
- IATA. (2025a). Air passenger forecast: Indonesia. International Air Transport Association.
- IATA. (2025b). Guidance material and best practices for aircraft leases. 4.1 Edition. International Air Transport Association.
- IFRS Foundation. (2016). IFRS 16 Leases: Effects analysis. IFRS Foundation.
- Ikatan Akuntan Indonesia. (2024). PSAK 116: Sewa. Dewan Standar Akuntansi Keuangan Ikatan Akuntan Indonesia.
- Indonesia Airport Authority. (2025). Indonesia airport traffic data. Processed data.
- International Accounting Standards Board. (2016). IFRS 16 Leases. IFRS Foundation.
- International Monetary Fund. (2020). Economic ownership in the context of financial and operating lease transactions: Aircraft. International Monetary Fund.
- IQ-EQ. (2026). High rates, tight supply: How Ireland powers aircraft leasing in a new era. IQ-EQ.
- Kementerian Keuangan Republik Indonesia. (1991). Keputusan Menteri Keuangan Republik Indonesia Nomor 1169/KMK.01/1991 tentang Kegiatan Sewa Guna Usaha (Leasing).
- Morrell, P., & Swan, W. (2006). Airline finance and aircraft leasing considerations in fleet planning. *Journal of Air Transport Management*.
- Organisation for Economic Co-operation and Development. (2026). Aircraft specific rules: ASU minimum interest rates and Commercial Interest Reference Rates for civil aircraft. OECD.
- PT Garuda Indonesia (Persero) Tbk. (2025). Annual report 2025. PT Garuda Indonesia (Persero) Tbk.

FINANCIAL EVALUATION OF AIRCRAFT ACQUISITION ALTERNATIVES: LEASE VERSUS BUY DECISION FOR GARUDA INDONESIA'S BOEING 737 MAX

Richlah Nia **et al**

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, 19(3), 425–442.

Vasigh, B., Fleming, K., & Mackay, L. (2020). *Foundations of airline finance: Methodology and practice*. Routledge.