

***QUANTITATIVE ASSESSMENT OF EARNINGS MANIPULATION AND
FUNDAMENTAL STRENGTH AT PT GARUDA INDONESIA (PERSERO) TBK
USING THE BENEISH M-SCORE AND PIOTROSKI F-SCORE (2019–2021; 2018
BASELINE)***

**PENILAIAN KUANTITATIF MANIPULASI LABA DAN KEKUATAN
FUNDAMENTAL DI PT GARUDA INDONESIA (PERSERO) TBK
MENGUNAKAN BENEISH M-SCORE DAN PIOTROSKI F-SCORE
(2019–2021; BASELINE 2018)**

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ABSTRACT

This thesis examines PT Garuda Indonesia (Persero) Tbk over 2018–2021 to provide a clear, rules-based view of its condition after the 2018 incident. The study asks two main questions: did manipulation signals in the financial statements decline after 2018, and did the company's fundamental strength improve in the same years? Using 2018 as a baseline, the research expects post-incident years (2019–2021) to show an M-Score that is more negative and an F-Score that is higher. Reading both indicators together allows a simple judgement about Garuda's post-incident trajectory that is useful for investors, creditors, regulators, and management. Methodologically, the study is quantitative, single-firm, and longitudinal. It uses audited annual financial statements (2018–2021) and harmonised definitions across years. The analysis computes the Beneish M-Score from eight indices to read manipulation risk and the Piotroski F-Score from nine signals to measure fundamentals. Each year is classified with standard rules, then compared with 2018 to obtain ΔM (more negative?) and ΔF (higher?). Results are read together to identify convergence ($M\downarrow$ & $F\uparrow$) or divergence, providing a concise, replicable picture of Garuda Indonesia after 2018.

Keywords: Beneish M-Score; Piotroski F-Score; Earnings Management; Financial Statement Manipulation; Reporting Quality; Fundamental Strength; Garuda Indonesia.

ABSTRAK

Tesis ini mengkaji PT Garuda Indonesia (Persero) Tbk selama periode 2018–2021 untuk memberikan pandangan yang jelas dan berbasis aturan mengenai kondisinya setelah insiden tahun 2018. Studi ini mengajukan dua pertanyaan utama: apakah sinyal manipulasi dalam laporan keuangan menurun setelah tahun 2018, dan apakah kekuatan fundamental perusahaan meningkat pada tahun-tahun yang sama? Dengan menggunakan tahun 2018 sebagai dasar, penelitian ini memperkirakan tahun-tahun pasca-insiden (2019–2021) akan menunjukkan M-Score yang lebih negatif dan F-Score yang lebih tinggi. Membaca kedua indikator tersebut bersama-sama memungkinkan penilaian sederhana tentang lintasan pasca-insiden Garuda yang bermanfaat bagi investor, kreditor, regulator, dan manajemen. Secara metodologis, studi ini bersifat kuantitatif, perusahaan tunggal, dan longitudinal. Studi ini menggunakan laporan keuangan tahunan yang diaudit (2018–2021) dan definisi yang diselaraskan antar tahun. Analisis ini menghitung Beneish M-Score dari delapan indeks untuk membaca risiko manipulasi dan Piotroski F-Score dari sembilan sinyal untuk mengukur fundamental. Setiap tahun diklasifikasikan dengan aturan standar, kemudian dibandingkan dengan tahun 2018 untuk mendapatkan ΔM (lebih negatif?) dan ΔF (lebih tinggi?). Hasilnya dibaca bersama untuk mengidentifikasi konvergensi ($M\downarrow$ & $F\uparrow$) atau divergensi, memberikan gambaran yang ringkas dan dapat direplikasi tentang Garuda Indonesia setelah tahun 2018.

Kata Kunci: Skor M Beneish; Skor F Piotroski; Manajemen Laba; Manipulasi Laporan Keuangan; Kualitas Pelaporan; Kekuatan Fundamental; Garuda Indonesia

INTRODUCTION

The aviation industry plays a crucial role in enabling global connectivity through trade, tourism, and

economic integration. In Indonesia, this role is even more significant due to the country's geographic structure as the world's largest archipelagic state,

where air transportation becomes a key mechanism for socio-economic mobility and national cohesion (World Bank, 2020). In emerging economies, air transport is frequently positioned not only as a means of travel but also as a catalyst for broader economic development (IATA, 2019). However, airlines operate under complex and high-risk conditions, characterized by heavy capital requirements, high fixed costs, and sensitivity to revenue fluctuations, which makes financial sustainability difficult to maintain even under normal market conditions (Doganis, 2019).

In recent years, Indonesia's aviation sector has entered a critical phase. Following the recovery trend after the COVID-19 disruption, the industry has faced renewed pressures related to geopolitical instability, supply chain challenges for aircraft components, fuel price increases, exchange-rate volatility, and regulatory constraints (Nona Aero Institute, 2025; Zona Terbang, 2025). These conditions have contributed to stagnant passenger volumes and operational limitations caused by maintenance bottlenecks and spare-part procurement difficulties (Zona Terbang, 2025). Such volatility reinforces the importance of financial resilience in the airline industry, where financial distress is frequently amplified by operating leverage and external shocks (Alici, 2023). Financial distress is commonly defined as a condition where firms experience difficulty meeting payment obligations or face imminent liquidity problems, making early identification essential for risk mitigation and managerial decision-making (Brigham & Daves, 2018). In addition, macroeconomic policy shifts influence key indicators such as inflation, interest rates, GDP growth, and exchange rates, which

directly affect firms' cash flow requirements and risk exposure (Sehgal, 2021; Alici, 2023).

PT Garuda Indonesia (Persero) Tbk occupies a strategic position within this context as Indonesia's national flag carrier and a publicly listed state-owned enterprise. Established in 1949 and listed on the Indonesia Stock Exchange in 2011, the company carries both commercial responsibilities and national representation functions (Garuda Indonesia, 2019). Despite this status, Garuda Indonesia has experienced challenges that extend beyond operational performance. In 2018, the company became involved in a major financial reporting controversy, where revenue of approximately USD 239 million from a partnership with Mahata Aero Teknologi was recognized prematurely, raising serious concerns regarding the credibility of its financial reporting (Kompas, 2019). This case attracted extensive public attention and regulatory intervention, with sanctions imposed by market authorities, emphasizing that such practices undermine investor confidence and the integrity of the capital market (Tempo, 2019). Prior studies have also noted that state-owned enterprises may be vulnerable to earnings management pressures due to dual objectives of profitability and public service obligations (Durana & Shakouri, 2020; Durana et al., 2022).

The post-2018 period also coincided with another major shock: the COVID-19 pandemic, which imposed unprecedented operational constraints on airlines worldwide. This dual crisis; governance credibility challenges after the scandal and operational deterioration during the pandemic creates a complex setting in which reporting behavior and underlying economic fundamentals may evolve in

different directions. In industries exposed to high uncertainty and disruption, transparent financial reporting becomes a critical mechanism for reducing information asymmetry and enabling stakeholders to evaluate both current performance and long-term sustainability (Barth et al., 2020). Moreover, airline operations remain sensitive to a wide range of disruptions, including technical failures, weather conditions, scheduling constraints, accidents, and systemic breakdowns, which increase financial vulnerability and the need for robust performance evaluation tools (Yanukoglu et al., 2024).

Such conditions highlight the need for structured analytical frameworks capable of assessing whether a firm demonstrates improving reporting integrity as well as strengthening economic fundamentals after a major crisis. Quantitative score-based methods provide a transparent mechanism to evaluate both dimensions. The Beneish M-Score functions as a forensic screening tool for detecting patterns statistically associated with earnings manipulation and potential misstatement, based on eight financial ratio indicators (Hugo, 2019; Husnurrosyidah & Fatihah, 2022; Miharsi et al., 2024). Meanwhile, the Piotroski F-Score evaluates firm fundamental strength using nine financial signals related to profitability, leverage and liquidity, and operating efficiency, and has been widely used to distinguish between financially stable firms and those vulnerable to distress (He & Tan, 2022; Rangapriya & Meenakumari, 2021). Applying these two approaches jointly supports a dual-perspective interpretation: manipulation risk screening on one side and fundamental financial strength

assessment on the other (Ravisankar et al., 2011; Festa et al., 2021).

Despite extensive discussion surrounding airline vulnerability and the 2018 Garuda controversy, existing research has not comprehensively examined whether Garuda's reporting integrity improved following regulatory enforcement while simultaneously tracking changes in firm fundamentals across subsequent crisis years. Most prior studies emphasize either performance distress or governance issues in isolation, leaving a gap in integrated post-scandal evaluation within a temporal crisis setting. Therefore, this study proposes a dual-model quantitative assessment of Garuda Indonesia by applying the Beneish M-Score and Piotroski F-Score to the 2019–2021 period, using 2018 as a crisis baseline. By doing so, the study aims to provide evidence on whether improvements in transparency are aligned with genuine fundamental recovery, and to contribute a replicable analytical approach for evaluating post-crisis financial credibility and resilience in the airline industry.

RESEARCH METHODS

This study employs a quantitative, single-firm longitudinal research design to evaluate post-incident financial reporting integrity and fundamental strength at PT Garuda Indonesia (Persero) Tbk. The analysis applies a sequential, model-based assessment framework using two established indicators: the Beneish M-Score (earnings manipulation screening) and the Piotroski F-Score (fundamental strength assessment). The observation window covers 2018–2021, where 2018 is treated as the baseline (incident year) and 2019–2021 as the post-

incident evaluation period, enabling consistent year-to-year comparison.

Data are obtained exclusively from secondary sources, namely audited annual financial statements (statement of financial position, income statement, cash flow statement, and accompanying notes) released through official corporate publications and regulatory disclosures. The use of audited documentary data supports objectivity, consistency, and replicability, and avoids subjectivity associated with primary instruments. Where restatements occur, the study relies on the latest audited restated figures to preserve comparability, and key line-item definitions (e.g., receivables, SG&A, depreciation, PPE, liabilities, and operating cash flow) are harmonized across years.

The analysis is conducted in three stages. First, financial reporting quality is evaluated using the Beneish M-Score, calculated from eight year-over-year indices (DSRI, GMI, AQI, SGI, DEPI, SGAI, LVGI, and TATA) and interpreted using standard thresholds (likely, possible, or unlikely manipulation). Second, financial fundamentals are assessed using the Piotroski F-Score, constructed from nine binary signals across profitability, leverage/liquidity, and operating efficiency dimensions (score range 0–9). Third, both scores are compared against the 2018 baseline to identify directional changes, where a more negative M-Score indicates improved reporting integrity and a higher F-Score indicates stronger fundamentals; the two outputs are then interpreted jointly to evaluate convergence or divergence patterns in post-incident performance

RESULTS AND DISCUSSIONS

Did Garuda Indonesia Exhibit a Lower Probability of Earnings Manipulation After 2018? (Beneish M-Score Results)

The 2018 revenue-recognition controversy positioned PT Garuda Indonesia (Persero) Tbk in an environment of heightened scrutiny from regulators, auditors, creditors, and capital market stakeholders. This context is critical because the credibility of financial reporting functions as a central mechanism through which stakeholders assess corporate transparency and governance discipline, particularly in industries with high uncertainty and high operating leverage such as aviation. In this study, the Beneish M-Score is applied as a forensic screening tool to evaluate whether Garuda exhibited a lower probability of earnings manipulation during 2019–2021, compared to the post-scandal reporting context anchored conceptually in 2018.

Unlike conventional profitability ratios that focus on performance outcomes, the Beneish M-Score captures abnormal accounting patterns that may signal opportunistic reporting behavior. The model aggregates eight year-over-year indices; DSRI, GMI, AQI, SGI, DEPI, SGAI, TATA, and LVGI that represent key dimensions of potential manipulation risk, including receivables pressure, margin deterioration, asset quality shifts, sales growth incentives, depreciation policy adjustments, expense intensity changes, leverage movements, and accrual reliance.

Prior forensic accounting literature emphasizes that abnormal movements in receivables, accruals, and asset quality are among the most frequent warning signals of earnings manipulation (Schilit, Perler, &

Engelhart, 2018). In line with this perspective, the Beneish M-Score provides an early-warning diagnostic that helps assess whether reported accounting outcomes remain consistent with normal economic behavior or reflect aggressive reporting incentives. It is therefore widely recommended as an initial screening mechanism to identify firms that warrant closer scrutiny for earnings management (Dechow, Sloan, & Sweeney, 1995).

Table 1. Beneish M-Score Components and Results (Garuda Indonesia)

GARUDA INDONESIA	0.92* (DSRI)	0.58* (GMI)	0.404* (AQI)	0.892* (SGI)	0.115* (DEPI)	0.172* (SGAI)	4.679* (TATA)	0.372* (LVGI)	BENEISH M-SCORE
2019	0.91606	0.75380	0.94985	1.05592	1.40892	1.05603	-0.11370	0.99082	-3.473275799
2020	0.92107	-0.48761	0.16329	0.32636	4.39380	4.29309	-0.32587	1.40775	-7.121808627
2021	0.94062	1.21891	1.79823	0.89569	0.78936	0.61258	-0.59176	1.56725	-5.283085815

Table 1. Beneish M-Score Components and Results (Garuda Indonesia) presents the computed M-Score outcomes for Garuda Indonesia in 2019–2021. The calculated Beneish M-Scores are -3.47 in 2019, -7.12 in 2020, and -5.28 in 2021. All three values fall below the conservative cut-off threshold of -2.22 , indicating that the firm is consistently classified as an unlikely earnings manipulator across the full post-incident observation period. From a classification standpoint, these results provide strong quantitative evidence that Garuda's financial statements in the years following the 2018 controversy do not exhibit statistical characteristics typically associated with high manipulation risk. In other words, the post-incident reporting environment appears to reflect relatively conservative disclosure behavior rather than aggressive earnings-management patterns.

However, the year-to-year movement of the M-Score provides deeper insight than static classification alone. The sharp decline in the M-Score from -3.47 (2019) to -7.12 (2020)

suggests a substantial strengthening of reporting discipline during the peak crisis year. Importantly, this improvement coincides with the most disruptive phase of the COVID-19 pandemic, where the airline industry experienced extreme operational contraction and financial distress. Under such extraordinary conditions, firms generally face intensified external monitoring, including stricter audit scrutiny, heightened regulatory attention, creditor monitoring, and stronger government involvement. In this setting, managerial discretion in applying aggressive accounting judgment tends to be constrained, reducing the opportunity for accrual-based reporting manipulation. Therefore, the pronounced improvement in the M-Score in 2020 can be interpreted as more plausibly driven by strengthened external governance pressure rather than endogenous operational recovery.

In 2021, the M-Score increased to -5.28 , indicating partial normalization relative to the exceptionally conservative reporting stance observed in 2020. Although this upward movement may suggest that reporting strictness relaxed as crisis pressures eased, the score remained substantially more negative than the 2019 level. This implies that overall reporting integrity in 2021 continued to be stronger than the early post-incident condition, suggesting that the discipline reinforced during the crisis period may have persisted beyond the immediate shock. From a component-level interpretation, the Beneish results in this study are described as being strongly influenced by accrual-related indicators, particularly TATA, which reflects the relative scale of accruals compared to total assets. The prominence of accrual-related effects aligns with the broader

crisis context, where gaps between operating cash flows and reported accounting outcomes may become more pronounced.

Overall, the Beneish M-Score results indicate that PT Garuda Indonesia (Persero) Tbk exhibited a consistently low likelihood of earnings manipulation throughout 2019–2021, with the strongest improvement occurring during the crisis year of 2020. Nevertheless, these findings should be interpreted specifically as evidence of reduced manipulation risk rather than proof of financial recovery. Cleaner reporting behavior does not necessarily imply stronger profitability, liquidity, or operational performance. Therefore, to evaluate whether enhanced reporting discipline was accompanied by stronger underlying fundamentals, the next section examines the firm's post-incident financial condition using the Piotroski F-Score framework.

Did Garuda's Financial Fundamentals Recover or Deteriorate During 2019–2021? (Piotroski F-Score Results)

In this study, the Piotroski F-Score integrates nine binary signals grouped into three different dimensions such as profitability, leverage/liquidity and funding, and operating efficiency. Each signal is scored as either 1 (criterion met) or 0 (criterion not met), producing a composite score ranging from 0 to 9, where higher values indicate stronger fundamentals and lower financial distress risk. Consistent with the study design, the F-Score is calculated for the period 2019–2021 with 2018 serving as the baseline year, allowing the study to track year-to-year changes in Garuda's financial health during the post-incident window. As stated in the framework used in this research, an F-Score above

five indicates relatively strong fundamentals, a score between three and five reflects moderate stability with notable weaknesses, and a score below three suggests weak financial conditions and elevated distress vulnerability.

Table 2. Piotroski F-Score Calculation Results (2018–2021)

Year	Profitability				Leverage, Liquidity & Funding		Operating Efficiency			Piotroski F-Score
	Net Income > 0 (Positive) (F1)	Operating Cash Flow > 0 (Positive) (F2)	Improvement in ROA (F3)	Operating Cash Flow > Net Income (F4)	DER (F5)	No Decline in Current Ratio Liquidity (F6)	Increase in Assets Turnover (F7)	Increase in Gross Margin (F8)	Increase in Inventory Turnover (F9)	
2018	0	1	-	1	-	-	-	-	-	-
2019	0	1	1	1	1	0	1	1	1	6
2020	0	1	0	1	1	0	1	0	0	4
2021	0	1	0	1	0	0	1	0	0	4

Table 2. Piotroski F-Score Calculation Results (2018–2021) summarizes the outcomes of the nine signals for Garuda Indonesia. The results show that Garuda recorded a Piotroski F-Score of 6 in 2019, followed by 4 in 2020 and 4 again in 2021. This pattern indicates that the company entered the post-incident period with a moderate-to-strong fundamental profile in 2019, but experienced a clear deterioration in fundamentals during the COVID-19 shock and did not demonstrate a meaningful recovery within the subsequent two years. While the score remained within the “moderate” band, the drop from 6 to 4 represents a material weakening, implying a reduced number of positive signals supporting profitability strength, balance sheet resilience, and operating efficiency.

From a business resilience standpoint, the 2019 score of 6 suggests that Garuda maintained a relatively stable fundamental position before the pandemic disruption fully materialized. Although the company continued to report net losses (resulting in a zero score for net income positivity), it demonstrated positive operating cash flow, indicating that operations were still generating cash inflows. The presence of operating cash flow exceeding net income also suggests

relatively strong earnings quality, as negative accounting results were influenced by non-cash components. In addition, selected improvements in efficiency-related indicators contributed positively to the overall score, reflecting a temporary strengthening of operational fundamentals despite persistent profitability challenges. Overall, the 2019 profile suggests that post-2018 restructuring efforts and operational adjustments were beginning to support internal stabilization.

In contrast, the Piotroski F-Score decline to 4 in 2020 reflects a deterioration in the firm's fundamentals during the height of the COVID-19 crisis. The continued negative net income signals weakened profitability, while return-on-assets performance deteriorated sharply due to reduced flight activity and demand contraction. Even though operating cash flow remained positive indicating that the company retained some ability to generate cash through operational adjustments and cost control other fundamental dimensions weakened. Liquidity remained pressured, as the current ratio continued to decline, reflecting increasing short-term solvency challenges. Operating efficiency also declined as key performance indicators such as gross margin and asset turnover weakened significantly, illustrating the extent to which fixed cost rigidity and revenue collapse eroded economic performance during the crisis period.

In 2021, the Piotroski F-Score remained at 4, indicating stabilization rather than recovery. The persistence of a moderate but weakened score suggests that Garuda was able to prevent further deterioration, likely supported by continued cost containment and operational

management, but failed to restore strong fundamentals within the observation window. Operating cash flow remained positive, which reflects ongoing resilience in cash-generating capacity. However, profitability remained negative, and fundamental balance sheet challenges persisted. Leverage conditions worsened, with long-term debt increasing substantially relative to total assets, and liquidity remained weak as the current ratio continued to decline. While asset turnover showed modest improvement suggesting early signs of operational normalization as flight activity gradually resumed the overall signal structure continued to reflect limited financial flexibility and persistent structural pressure.

Overall, the Piotroski F-Score findings indicate that Garuda Indonesia's fundamentals deteriorated from 2019 to 2020 and remained weak but stable in 2021. This confirms that although the company maintained some resilience through positive operating cash flows and avoided equity dilution, its profitability, liquidity strength, and efficiency recovery remained constrained. Therefore, while the Beneish analysis suggests reduced manipulation likelihood in the post-incident period, the Piotroski outcomes indicate that Garuda's fundamental recovery was incomplete during 2019–2021. This reinforces the importance of evaluating reporting integrity and financial fundamentals jointly, as improvements in transparency may occur even when economic strengthening remains limited.

How Do Beneish and Piotroski Complement Each Other in Explaining Garuda's Post-Crisis Performance?

To provide a holistic interpretation of post-incident performance, the Beneish M-Score and Piotroski F-Score are evaluated jointly using 2018 as a conceptual benchmark. This integrated approach is important because the two models capture fundamentally different dimensions of corporate condition. The Beneish M-Score functions as a forensic indicator of accounting-based manipulation risk embedded in financial reporting behavior, while the Piotroski F-Score evaluates the firm's operational and financial fundamentals through profitability, leverage/liquidity, and efficiency signals. Reading both scores together reduces the risk of drawing misleading conclusions from either model in isolation. In particular, it prevents "cleaner reporting" from being automatically interpreted as "stronger fundamentals," and allows the analysis to distinguish transparency improvements from real economic strengthening. This distinction is especially relevant in post-scandal and crisis environments, where external scrutiny and institutional pressures may alter reporting incentives even when business fundamentals remain weak.

The results show a clear divergence pattern between 2019 and 2020. Reporting integrity improved sharply as reflected by the more negative Beneish M-Score (−3.47 to −7.12), while fundamentals weakened as reflected by the Piotroski F-Score decline (6 to 4). This divergence indicates that Garuda's financial reporting became substantially more conservative during the crisis period even as its underlying economic condition deteriorated. Such a pattern implies that improvements in reporting quality were likely shaped by crisis-driven constraints, including intensified monitoring from auditors, regulators,

creditors, and government stakeholders, rather than by a parallel recovery in profitability or efficiency.

Under severe external shocks such as the COVID-19 disruption, firms may face reduced managerial discretion in accounting policy choices while simultaneously experiencing material revenue contraction and cost rigidity. Therefore, the divergence observed in 2020 suggests that stronger reporting discipline can coexist with weakening fundamentals, highlighting that transparency does not necessarily translate into immediate financial resilience.

From 2020 to 2021, the results shift toward partial convergence. Reporting discipline relaxed moderately as indicated by the Beneish M-Score increase (−7.12 to −5.28), while the Piotroski F-Score remained stable at a moderate level (4). This configuration implies that the exceptional conservatism observed during the peak crisis year began to normalize as operational conditions partially stabilized and external pressure may have eased. However, the unchanged F-Score suggests that Garuda's financial fundamentals did not significantly improve within the period. In other words, while reporting behavior moved toward a less extreme stance, the company did not show a corresponding recovery in profitability, liquidity flexibility, or operating efficiency strong enough to raise its fundamental score. This outcome indicates that the post-crisis recovery trajectory remained uneven and constrained, with stabilization occurring earlier than genuine strengthening.

Overall, the integrated reading confirms that Beneish and Piotroski complement each other by offering a two-layer diagnostic interpretation of

post-crisis corporate condition. The Beneish M-Score strengthens the credibility assessment of reported accounting numbers by screening manipulation likelihood, while the Piotroski F-Score evaluates whether such reporting credibility is supported by improving economic substance. For Garuda Indonesia, the combined results imply that post-2018 improvements in reporting integrity were not matched by equivalent improvements in financial fundamentals, reinforcing the argument that corporate recovery is multidimensional. This joint interpretation provides a more balanced assessment for investors, regulators, and other stakeholders, particularly in capital-intensive industries where firms may face strong incentives to maintain credibility signals even amid sustained operational distress.

CONCLUSION AND SUGGESTION

This study demonstrates that an integrated financial diagnostic framework combining earnings manipulation screening using the Beneish M Score and fundamental strength assessment using the Piotroski F Score can effectively evaluate post crisis corporate recovery in a transparent and replicable manner. By applying this framework to PT Garuda Indonesia (Persero) Tbk, the research addresses the practical challenge of distinguishing between improvements in financial reporting integrity and improvements in real economic fundamentals during the period 2019 to 2021, using 2018 as a conceptual baseline following the revenue recognition controversy.

The results indicate that Garuda exhibited consistently low earnings manipulation risk throughout the observation period. Beneish M Score

values remain far below the conservative cut off threshold of minus 2.22, at minus 3.47 in 2019, minus 7.12 in 2020, and minus 5.28 in 2021, classifying the firm as an unlikely earnings manipulator across all post incident years. At the same time, the Piotroski F Score results show that Garuda's fundamentals weakened after 2019, declining from 6 in 2019 to 4 in 2020 and remaining at 4 in 2021. While operating cash flow stayed positive, major profitability and efficiency signals deteriorated, indicating that the firm's fundamental resilience did not recover within the same timeframe.

Importantly, the findings highlight that post crisis recovery was not driven by a single dominant direction of improvement, but instead reflects a divergence convergence dynamic between reporting integrity and fundamentals. Between 2019 and 2020, Garuda experienced a sharp improvement in reporting quality as reflected in a more negative M Score while fundamentals deteriorated as reflected in a lower F Score, suggesting that accounting discipline strengthened under crisis driven pressure rather than under operational recovery. From 2020 to 2021, partial convergence emerges as reporting behavior normalized slightly while fundamentals stabilized, indicating an early transition phase rather than a complete turnaround. This pattern reinforces the importance of evaluating transparency and economic performance jointly rather than relying on one metric to represent overall recovery.

From a managerial perspective, this study confirms that an integrated diagnostic approach provides actionable decision support for firms operating in high risk, capital intensive, and highly regulated industries such as aviation. The Beneish M Score can

serve as a continuous governance tool to monitor earnings manipulation risk and maintain reporting discipline beyond crisis conditions. In parallel, the Piotroski F Score offers a structured way to identify weak areas requiring operational intervention, particularly in margin recovery, asset efficiency improvement, liquidity strengthening, and leverage control. The results suggest that transparency improvements should be treated as a necessary foundation for credibility, but not as sufficient evidence of turnaround success.

Based on these conclusions, it is recommended that PT Garuda Indonesia (Persero) Tbk institutionalize both indicators as part of routine internal monitoring and restructuring evaluation. Implementation should be supported through quarterly score tracking under internal governance dashboards, ensuring that reporting integrity remains stable while financial fundamentals are progressively strengthened. In addition, management performance targets should be aligned with fundamental improvement signals captured by Piotroski, such as efficiency and capital structure recovery, rather than relying solely on short term performance narratives.

From an academic perspective, this study contributes an integrated and replicable application of the Beneish and Piotroski framework in a post scandal and crisis setting within the aviation industry. Future research may extend the observation period beyond 2021 to evaluate whether the stabilization phase develops into sustained recovery. Comparative studies across Southeast Asian airlines and the incorporation of qualitative restructuring narratives may also strengthen generalizability and deepen understanding of how governance

pressure and crisis shocks shape the relationship between reporting behavior and economic fundamentals.

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