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Financial Impact on Aviation Industry Before and During Covid-19: Passenger Demand as Moderator

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Abstract: This study analyses the impact of the pandemic on the financial performance of airlines, with a specific focus on financial ratios. The travel limitations imposed as a result of the pandemic, coupled with a significant decline in passenger demand, resulted in significant financial losses. This study investigates how passenger demand moderates the relationship between financial ratios and the performance of the aviation industry. This study gathered data from 20 premier Asian airline companies, as acknowledged by Skytrax. The data was collected from 2016 to 2022, with the timeframe from 2016 to 2019 designated as the 'pre-Covid19' period, and the timeframe from 2020 to 2022 designated as the 'during Covid19' period. The study uses static panel data analysis to accomplish its objective by integrating cross-sectional and time series analysis. Based on this analysis, it was determined that the company's financial condition had a substantial impact on its performance and operating worth before the COVID-19 outbreak. This influence was observed across all variables, except TATO (Total Assets Turnover). However, the company's financial condition does not affect its performance during the COVID-19 outbreak. This is due to the implementation of government initiatives and bailouts offered some respite, while also underscoring pre-existing structural weaknesses within the business. The results emphasize the crucial requirement for airlines to implement adaptable financial strategies and strong risk management techniques to successfully navigate future disruptions. Hence, the aviation sector should embrace a comprehensive strategy centered on minimizing expenses, expanding income sources, and implementing digitalization.

Keywords: *Aviation Industry, financial performance, passenger demand, ratios, COVID-19*

1. Introduction and Background

In 2008, a global financial crisis occurred, leading to a widespread economic recession in most countries. It required several years for companies to recuperate and restore their stability. However, the most intense outbreak occurred in December 2019 when the Coronavirus Disease (COVID-19) was identified in Wuhan, China. By the end of January 2020, COVID-19 was formally designated as a global public health emergency. On March 11, 2020, it was officially designated as a pandemic (Cucinotta & Vanelli, 2020). Although the long-term effects of COVID-19 are still undetermined, the crisis had a significant and widespread influence on a global scale in 2020 and 2021. This resulted in another global financial crisis that profoundly harmed individuals and businesses in both the public and private sectors.

The epidemic caused significant financial devastation throughout the whole aircraft value chain, particularly impacting the aviation industry. Bouwer et al. (2022) found that in 2020, all subsectors, except for goods forwarders and cargo airplanes, suffered significant financial losses as a result of a decline in demand for air cargo. Even industries and airports, which are typically considered dependable providers of economic value, were not spared from the economic repercussions of the pandemic. The COVID-19 epidemic has caused substantial financial losses for the airline industry, despite initial expectations of smooth performance. In 2020, the aviation industry had a significant decline in revenues by 55% or US$314 billion (IATA, 2020). This financial setback will have a lasting impact on the aviation business, as it continues to grapple with ongoing health concerns (Bouwer et al., 2022). Air Asia Group Berhad, a prominent long-haul low-cost airline, has been categorized by Bursa Malaysia Securities as a 'Practice Note 17' (PN17) firm, signaling a deteriorating financial condition (Alrawi, 2020). Air Asia, a key player in the private aviation market, has been categorized as PN17 as a result of financial difficulties stemming from the repercussions of COVID-19. This airline is so vast that it cannot be overlooked. These adjustments have significantly altered the core characteristics and viewpoints of the industry, reshaped the sector, and posed significant challenges to the airline industry.

To minimize the spread of COVID-19, governments around the world enforced lockdown measures that included restrictions on movement, isolation from social interactions, obligatory quarantines, shutdown of airports, and prohibitions on travel (Thiagararan, 2021). These policies have a significant impact on the aviation industry in Asia. The COVID-19 epidemic and the measures used to mitigate its spread have substantially reduced the need for passenger air travel, hence jeopardizing the financial viability of numerous businesses in the air transport sector and the broader aviation industry (OECD, 2020). The sharp decline in the demand for passenger travel (Bouwer et al., 2022) has resulted from a mix of government-enforced lockdowns and anxiety about getting and spreading the illness. As a consequence, air travel firms have experienced financial instability. Unanticipated fluctuations in transportation demand have also occurred owing to sudden choices made by passengers, which have had a substantial impact on their travel patterns due to perceived risks associated with travel. The restrictions imposed on the spread and impact of COVID-19 have had a significant impact on people's lives and the whole economy.

A decline in passenger demand could lead to the undervaluation and overinvestment in assets that an aircraft company is unable to sell to cover its expenses (Husna et al., 2022). The existence of a detrimental passenger demand has led to a forthcoming period marked by unpredictability. The ubiquitous ambiguity exerts a major impact on the whole aviation business, due to its interconnection with sectors such as tourism and trade. Moreover, the aviation sector is still vulnerable to a potential return of a pandemic, since governments may enforce further restrictions on air travel or mobility in response to outbreaks or a potential second wave of infections. Consequently, there has been a significant decrease in both passenger demand and the financial performance of airline firms, including the devaluation of their assets (Husna et al, 2022). If there is no growth in passenger demand and revenue, the aviation industry will encounter difficulties in financing assets and fulfilling obligations (Li, 2024). The emergence of the Covid-19 outbreak worsened the previously identified problem. The global aviation sector has incurred significant financial losses as a direct consequence of the epidemic, leading to lowered ratings, liquidations, and bankruptcies. Although there is a continued threat of a pandemic recurrence, the airline industry is essential and too crucial to fail, considering its substantial contribution to the economic advancement of the country.

Hence, this research especially concentrates on two key topics of emphasis. The study seeks to empirically investigate the factors that impact the financial performance of 20 airline firms that were recognized as the leading airlines in Asia by Skytrax, both before and during the COVID-19 pandemic. The evaluation of the factors is conducted by utilizing the financial ratios of the aviation industry, including liquidity, efficiency, and leverage. This study also aims to assess the moderating impact of passenger demand on the relationship between financial ratios (liquidity, efficiency, and leverage) and the performance of the aviation industry in Asia.

2. Literature Review

Aviation Industry Financial Performance: The purpose of financial performance analysis is to evaluate the performance of a company to make well-informed decisions and effectively monitor and manage its financial situation (Daryanto et al., 2020). According to Suhadak et al. (2018), financial performance is a metric that gauges a company's ability to achieve its objectives with effectiveness and efficiency. Optimizing a company's financial performance is essential to attract potential investors. According to Hayes (2022), profit and sales are often used measures to evaluate a company's financial performance. The notion of profitability has been thoroughly examined in financial literature concerning financial performance. The financial viability of a firm has a substantial influence on its capacity to sustain competitiveness. Yildirim (2018) found that profitability is a method that organizations use to improve the value of their shareholders. Alahyari (2014) argues that firms continually prioritize profitability because of its crucial importance to their entire performance. The financial condition of a firm is impacted by its profitability and its capacity to generate cash using its existing resources. Companies that exhibit high profitability ratios are considered financially prosperous, whilst those with low profitability ratios are deemed financially unsuccessful. The claim is supported by Maverick (2022) research, which argues that the profit margin ratio is the primary statistic used to assess both profitability and performance. The profitability ratios were used as dependent variables to illustrate the elements that influence profitability. The NPM (Net Profit Margin) and ROA (Return on Assets) ratios are the dependent variables in this study. Due to the significant correlation between the CR ratio and both ROA and ROE, the decision was

made to omit ROA. This study employs the NPM technique to assess the variability of profit at both the operational and income levels. Financial performance can be evaluated using different metrics, including liquidity, leverage, and solvency (Fatihudin et al., 2018). Stobierski (2020) identifies several key financial performance indicators that should be tracked, including the current ratio, quick ratio, debt-to-equity ratio, inventory turnover, total asset turnover, return on equity, return on asset, operating cash flow, and seasonality.

Underpinning Theory: Hawley's Risk Theory of Profit and Lancaster's New Theory of Demand. Hawley's Risk Theory of Profit asserts that profit signifies the social expense linked to undertaking the inherent risks of operating a firm. Hawley's theory of profit posits that a businessperson anticipates receiving remuneration for undertaking risk that is beyond the actuarial value sometimes referred to as the premium on measurable risk. Every entrepreneur strives to earn greater profits than the remuneration paid by the management in exchange for bearing the risks of the business. Hawley's 1893 research suggests that it is advisable to keep earnings beyond the threshold of actuarial risk. This is because undertaking risk can result in a multitude of problems and inefficiencies among entrepreneurs. Profit is the remuneration obtained in exchange for undertaking risks and obligations as an entrepreneur. Hawley (1893) identified several hazards in business, such as product obsolescence, price reductions, the emergence of superior alternatives, major disasters, and scarcity of essential production inputs. Hawley argues that only those persons who take on the duty of dealing with dangers will be able to obtain rewards, particularly in the form of financial gain.

Liquidity: Liquidity refers to a company's ability to convert its assets into cash to fulfill its financial responsibilities and make payments. The current ratio and the quick ratio are often used metrics for evaluating accounting liquidity (Vieira, 2010). Insufficient liquidity levels might result in higher financial expenses and the inability to fulfill one's obligations. Considering that liquidity risk plays a substantial role in triggering financial crises, it is imperative to include it while evaluating financial performance. According to Alahyari et al. (2014), a robust liquidity position is indicative of the financial stability of a company. The current ratio is a quantitative indicator that assesses the financial robustness or vulnerability of a corporation (Manaf et al., 2020). Bankruptcy may arise for a business if it is unable to meet its immediate financial obligations using readily accessible liquid assets. Due to aviation's considerable capital demands and hefty debt levels, airline companies are highly suitable for research using this financial metric. Dirman (2020) asserts that liquidity has various effects on financial crises. This scenario may arise as a result of a company's liquidity level, which is independent of its ability to withstand a financial crisis. Therefore, the existence of liquidity can improve financial performance, as supported by the study conducted by Cheong and Huy (2021), which demonstrates that an augmentation in liquidity leads to higher profitability. High liquidity ratios suggest that the company will promptly fulfill its debt obligations, whereas low levels imply the opposite. High current ratios offer potential investors significant benefits. The increase in current assets will result in a rise in investor interest in investing. Yosya and Baraja (2019) found that the current ratio has a small positive effect on changes in earnings. Riyadi (2017) found a direct relationship between the extent of profit change and the current ratio.

However, Alifiah (2014) and Platt et al. (2008) predict that there is a negative relationship between liquidity measures (current ratio, quick ratio, working capital ratio) and financial success. According to their analysis, these procedures only assist companies in fulfilling their financial obligations. Nunes et al. (2009) conducted a study on the profitability of the service industry in Portugal and found that liquidity does not have a major influence on profitability. Asimakopoulos et al. (2009) found that inadequate management of existing assets, particularly difficulties in selling inventories or generating income from past sales, had a detrimental impact on a firm's profitability. This occurs when the company amasses an excessive amount of inventory or outstanding payments. Thus, the hypothesis is:
H1: Liquidity has a significant impact on the aviation industry's financial performance before COVID-19.

Efficiency: The corporation should leverage its assets to produce profit. Inadequate management of assets by a firm will result in increased expenditures and decreased revenue, ultimately having a detrimental effect on performance (Alahyari et al., 2014). Activity ratios are a useful tool for evaluating the effectiveness of a company's management of its assets. The financial performance of a corporation is commonly evaluated by analyzing the working capital ratio and total asset turnover. The importance of TATO in this study is in its capacity to assess the effectiveness with which an airline company manages its assets, considering the significant financial resources needed in this sector. A study conducted by Fadhlur and Haron (2017) showed

that a reduction in asset utilization results in a corresponding decrease in the cost of capital. Hence, the rise in profitability suggests that the total asset turnover significantly impacts the profitability and performance of organizations. Erawati and Chandra (2016) conducted a study and found that TATO has a substantial beneficial influence on return on assets (ROA). The TATO metric quantifies the effectiveness of converting the value of assets into sales. The study conducted by Nicoleta et al. (2019) shows that when evaluating financial performance using return on assets (ROA), the efficiency ratio is more strongly affected by total asset turnover.

Seilsepoor and Ahmadi (2017) discovered that the financial crises of a corporation are notably affected by the return on assets, return on equity, current ratio, leverage ratio, and total asset turnover ratio. Both investigations have verified that the overall asset turnover significantly impacts financial performance and profitability. Rahmah et al. (2016) provide additional evidence that the efficiency ratio, namely the total asset turnover, has a positive and significant influence on the success of the automobile sector. This industry, similar to the aviation sector, requires a significant amount of capital investment. However, several studies have presented data supporting the negative relationship between Total Assets Turnover (TATO) and business performance. Alifiah (2014) conducted a study that found a negative association between profitability ratios, notably the net profit margin (NPM) and return on assets (ROA), as markers of financial success in several product industries, including the aviation sector. Gu and Gao's 2000 research indicates that an assertive company strategy can lead to high efficiency. This strategy entails prioritizing rapid sales expansion while disregarding the significance of cost management. Nevertheless, this strategy also exposes the organization to additional vulnerabilities, which might ultimately result in a decline in the company's overall performance. Thus, the hypothesis is:
H2: Efficiency has a significant impact on the aviation industry's financial performance before COVID-19.

Leverage: Leverage is an investment technique that involves using borrowed cash, financial instruments, or borrowed resources to increase the potential return of an investment (Hayes, 2022). It is a tool that can be used to evaluate financial performance. The commonly employed metrics for evaluating a company's financial leverage and performance are the Total Debt to Total Assets ratio (DR) and the Debt-to-Equity Ratio (DER). In the airline industry, airline businesses require substantial capital investment and heavily depend on debt arrangements because of the substantial value of their physical assets. Due to the enormous worth of physical assets in the aviation sector and the widespread use of heavy long-term debt for acquiring assets and advancing technology, it is typical to maintain a high level of financial leverage (Fernando, 2020). The research carried out by Sembiring and Damanik (2020) demonstrates that both elevated and diminished debt-to-equity ratios have a substantial impact on a company's ability to attain a return on assets (ROA). Minimizing the costs associated with loans and other forms of debt below the cost of capital can increase their profitability. Therefore, it can be deduced that keeping a low debt-to-equity ratio has a significant and advantageous impact on the return on assets (ROA). The claim is supported by Kuswadi (2005) research, which demonstrates that a higher debt-to-equity ratio (DER) is linked to greater total debt and consequently results in higher profits. As a result, this has a significant impact on the increase in income and the overall profitability of the organization.

However, previous studies have shown that both leverage and profitability are negatively affected. As stated by Asimakopoulos et al. (2009), higher levels of leverage have a detrimental effect on profitability. This is because when a corporation has more debt, it is required to dedicate a greater portion of its resources towards repaying that debt. As a result, the firm has less cash available for investment. Sunaryo (2022) asserted in his research that when the return on assets is less than the cost of debt, leverage will diminish the rate of return on capital. Hence, the corporation must prioritize reducing its dependence on debt to attain profitability. Nevertheless, financial leverage has a paradoxical effect on firm profitability during periods of economic decline. The reason for this is that an economic crisis can result in liquidity issues, so impeding the firm's ability to fulfill its interest obligations. The citation "Ismail et al., 2019" refers to a publication by Ismail and colleagues in the year 2019. Thus, the hypothesis:
H3: Leverage has a significant impact on the aviation industry's financial performance before COVID-19.

Firm Size: The success of airlines is largely influenced by the size of the firm, with larger airlines often seeing advantages from economies of scale, resulting in lower costs per unit and more market influence. Major airlines can utilize their scale to get more favorable agreements for fuel, maintenance, and airport charges. Additionally, they tend to possess more broad networks, which can lead to increased revenue prospects and improved

operational effectiveness (Graham, 2014). In contrast, smaller airlines may encounter difficulties due to increased operational expenses and limited ability to negotiate, which could impact their financial stability and competitive standing (Barrett, 2004). The larger scale of a company frequently leads to greater performance indicators, such as increased profitability and enhanced service offerings (Button, 2008).

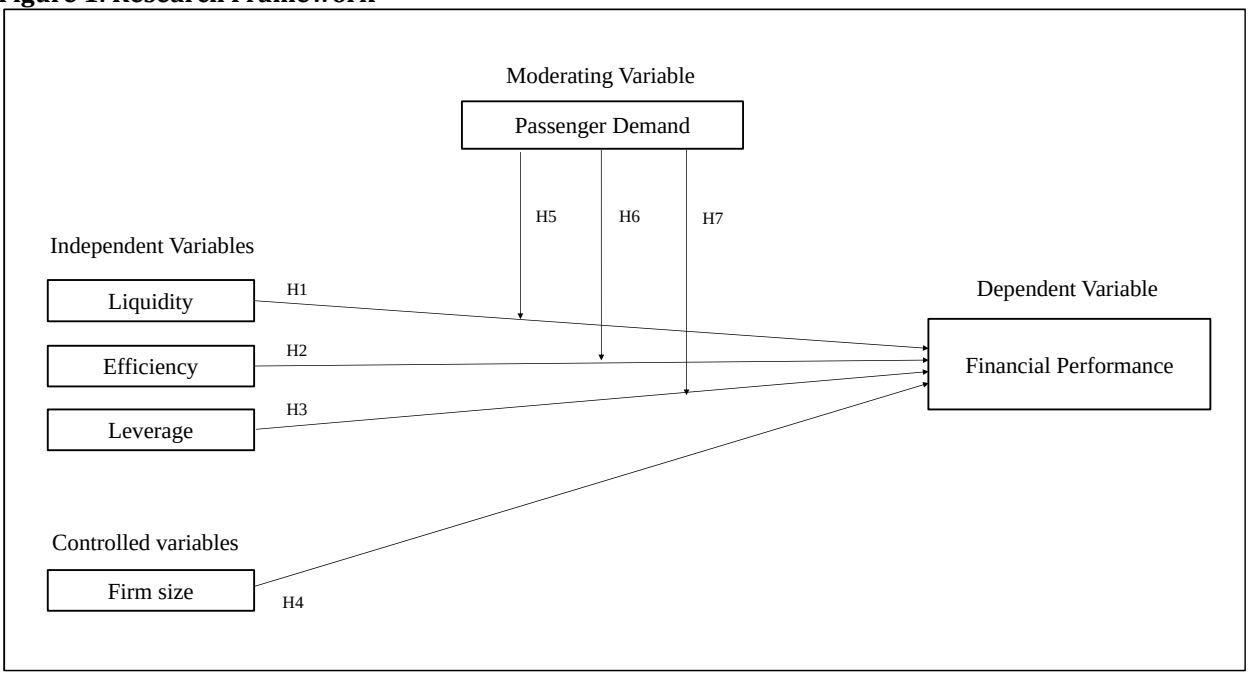
The COVID-19 pandemic had a considerable impact on airline operations, with larger carriers generally performing better than smaller ones because of their higher financial resilience and capacity to handle unexpected events. Big airlines were better equipped to use their economies of scale to lessen the financial burden of fewer passengers. They benefited from having different sources of income, bigger fleets, and more extensive networks that made it easier to transport cargo and receive government assistance (IATA, 2020). Smaller airlines, on the other hand, faced more severe challenges. They had to deal with higher costs compared to larger airlines and had restricted access to both capital and government assistance. These factors worsened their financial problems and resulted in increased rates of insolvency and withdrawal from the market (Gössling et al., 2020). Thus, the hypothesis:
H4: Firm size has a significant impact on the aviation industry's financial performance before COVID-19.

Passenger Demand as Moderator: Liquidity measures, such as the current ratio, quick ratio, and cash ratio, are crucial in evaluating an airline's capacity to fulfill its immediate financial obligations by utilizing its most readily convertible assets. These ratios emphasize the airline's financial stability and operational flexibility, which are essential for effectively handling changes in passenger demand and economic downturns (Brigham & Ehrhardt, 2016). A robust cash position enables airlines to meet their fixed expenses, overcome financial difficulties, and make strategic investments in technology and services, hence fostering long-term operational efficiency and competitive edge (Pike & Neale, 2009). The total asset turnover of airlines can be considerably influenced by passenger demand, which quantifies the efficiency with which an airline utilizes its assets to create income. As the demand from passengers rises, airlines frequently observe an increase in income, resulting in enhanced utilization of assets and a larger ratio of total assets turnover. In contrast, when there is less demand, the airline's income declines, which can lead to a decrease in the efficiency of asset utilization and a lower turnover ratio. Airlines must prioritize efficient asset management since it directly correlates with improved sales generation from assets. High asset turnover signifies greater performance, whereas low turnover shows underutilization of resources (Higgins, 2012). This situation emphasizes the significance of synchronizing operational plans with demand patterns to maximize asset efficiency and financial success.

The leverage ratio of an airline is greatly influenced by passenger demand, as it quantifies the extent to which debt is utilized to fund the company's assets. Increased passenger demand usually results in higher revenues, which can help an airline pay down its debt and perhaps lower its leverage ratio by reducing the percentage of debt to equity. On the other hand, when there is less demand for flights, the airline's financial health might be negatively affected since it may have less income. This can result in higher leverage ratios, as the company may need to rely more on borrowing money to continue operating or to increase its capacity (Brealey, Myers, & Allen, 2017). Strong passenger demand can help an airline manage its debt more effectively and reduce financial risk. Conversely, inadequate demand might worsen the issues connected to debt leverage. Thus, the hypothesis:
H5: Passenger Demand moderates the relationship between liquidity and the aviation industry's financial performance before COVID-19.
H6: Passenger Demand moderates the relationship between the efficiency and the aviation industry's financial performance before COVID-19.
H7: Passenger Demand moderates the relationship between leverage and the aviation industry's financial performance before COVID-19.

In Figure 1, the researcher concentrated on the Current Ratio (CR), Total Asset Turnover (TATO), Debt Equity ratio (DTE), and firm size which stand for internal factors that influence the 20 Best airline companies' financial performance.

Figure 1: Research Framework



3. Research Methodology

The study does a quantitative analysis by utilizing secondary data extracted from the financial accounts of specific airline firms. The selection of these companies was based on their ranks in the Asia region as per the Skytrax ranking list and award. This study aims to assess and contrast the financial performance of 20 airline companies that were honored with the esteemed Skytrax Best Airlines in Asia award in both 2019 and 2021, particularly in the context of the COVID-19 pandemic. Therefore, we analyze a thorough dataset that covers a period of seven years (2016 to 2022). The years 2016 to 2019 are designated as the 'pre-COVID-19' period, while the years 2019 to 2022 are designated as the 'during COVID-19' period. The inaugural year for each airline company is subject to variation and unreliability due to the limited availability of data. Therefore, the year 2016 is utilized as a reference point to give a limited depiction of businesses functioning in a beneficial economic setting, wherein their sales and financial achievements were steadily increasing before the epidemic (OECD, 2020). Furthermore, this study has opted to omit certain years before 2016 to uphold consistent data collecting and analyze the development of the identical sample across time. The study concluded in 2022 due to the unavailability of comprehensive data for the current year, 2023, to the researcher. Furthermore, (Salim, 2022) has officially declared that 2022 will mark the shift to the endemic phase of COVID-19. The metric used to assess moderating variables before and during the COVID-19 pandemic in this study is the passenger volume transported by airline companies throughout the specified timeframe. The study will consider firm size as a controlled variable. This study employs panel data as its secondary data source. The secondary data is acquired from an external source known as the Thomson Reuters Eikon Database. The study will employ the STATA 17.0 program to analyze all the requirements. This study utilizes the following regression models to elucidate the factors influencing profitability. The definitions and measurements of each variable utilized in this study are presented in Table 1:

Table 1: Definition and sources of variables

Variables	Description	Data source
DV: Aviation Performance (NPM)	Net Profit Margin (NPM) based on the aviation industry (Net Profit / Sales)	Thomson Reuters
Liquidity: (CR)	Current Ratio (CR) (Current assets/Current liabilities	Thomson Reuters

Efficiency (TATO)	Total Asset Turnover (TATO) (Sales/Total Asset)	Thomson Reuters
Leverage (DTE) (LRATIO)	Debt-Equity Ratio (DTE) (Total Debt/Total Equity)	Thomson Reuters
Firm Size (FS)	Log of Total Assets	Thomson Reuters
Passenger Demand (PD)	Passenger load factor (Numbers of passengers/ total seats)	Thomson Reuters

Model Specifications: Based on the explanation above, the estimation models of this study are as follows:

Model 1: $NPM = \alpha + \beta CR + \beta TATO + \beta DTE + \beta SIZE + \varepsilon t$

Model 2: $NPM = \alpha + \beta CR + \beta TATO + \beta DTE + \beta SIZE + \beta CR*PD + \beta TATO*PD + \beta DTE* PD + \varepsilon t.$

The baseline model, referred to as Model 1, analyzed the direct influence of financial performance on aviation industry performance. On the other hand, the interaction model, known as Model 2, investigated the moderating impact of passenger demand on aviation industry performance. The panel data regression approach was employed to analyze these models. Panel data offers the advantage of allowing control over unobserved time-invariant heterogeneity, which increases the degree of freedom and improves the efficacy of the estimators (Baltagi, 2008). The investigation incorporated marginal effect analysis to examine the impact of competition levels on financial stability.

4. Results

Descriptive Statistics: This section presents the results of the Descriptive Analysis, Static Panel Data, and Multicollinearity Procedure. Tables 2a and 2b display the descriptive statistics that reveal significant changes in key financial metrics before and during the COVID-19 pandemic. Net Profit Margin (NPM) experienced a sharp decline, with the mean dropping from 0.0208 before the pandemic to -0.0686 during COVID-19, reflecting a substantial reduction in profitability. This was accompanied by increased variability, as indicated by the rise in the standard deviation during the pandemic. The Current Ratio (CR), a measure of liquidity, decreased slightly from a mean of 0.8018 to 0.6684, suggesting a minor reduction in firms' ability to meet short-term liabilities. However, the relatively small change in CR implies that liquidity remained more stable compared to other financial measures. Total Asset Turnover (TATO), which measures the efficiency of firms in using assets to generate revenue, saw a marked reduction from 0.6525 to 0.3012 during the pandemic, reflecting a significant decrease in operational efficiency. The Debt-to-Equity Ratio (DTE) was only reported before the pandemic, with a mean of 4.7969, indicating that firms were more leveraged pre-crisis. The absence of DTE data during the pandemic may suggest shifts in firms' financial structures.

Additionally, firm size declined from a mean of 1.3693 before the pandemic to 1.1679, indicating a contraction in firm operations, likely driven by downsizing or reduced activity in response to economic conditions. The differences between the maximum and minimum values further highlight increased variability, particularly in NPM, where the range expanded from -0.0754 to 0.1234 before the pandemic to -0.6084 to 0.5566, showing greater extremes in firm performance. For TATO, the range narrowed, signaling that firms were less efficient overall, with fewer outliers in performance during the pandemic.

The skewness and kurtosis metrics provide additional insights into the distribution of the data. For NPM, skewness increased from 0.1388 before the pandemic to 0.6906, indicating a shift toward more firms experiencing negative profitability, while a few outliers managed to perform well. In terms of kurtosis, NPM showed a more uniform distribution during the pandemic, with fewer extreme outliers compared to before. In contrast, TATO exhibited higher kurtosis during the pandemic, suggesting more extreme values and a concentration of firms with lower operational efficiency. Overall, the increased range, skewness, and kurtosis during the pandemic suggest heightened variability in firm performance, with more firms experiencing difficulties, while a few outliers performed exceptionally well. These findings demonstrate that while profitability, efficiency, and firm size were significantly impacted, liquidity remained relatively stable during the COVID-19 crisis.

Table 2a: Descriptive statistics before COVID-19

Variable	NPM	CR	TATO	DTE	PD	FS
Mean	0.0208253	0.8017647	0.6525	4.796912	0	1.369316
Minimum	-0.0754002	0.18	0.3	1.74	0	0.974972
Maximum	0.1234113	2.39	1.38	21.85	0	1.944223
Std. dev	0.0409733	0.5457077	0.2398779	3.673027	0	0.2798854
Skewness	0.1388	0.0003	0.0001	0.0000	0	0.0773
Kurtosis	0.2729	0.2430	0.0259	0.0000	0	0.0017
Observation	68	68	68	68	68	68

Table 2b: Descriptive statistics during COVID-19

Variable	NPM	CR	TATO	DTE	PD	FS
Mean	-0.0685609	0.6684314	0.3011765	0	0	1.167886
Minimum	-0.6083964	0.05	0.05	0	0	0.6161528
Maximum	0.5565591	2.25	1.07	0	0	2.045525
Std. dev	0.1647963	0.4979051	0.1757799	0	0	0.3177718
Skewness	0.6906	0.0029	0.0000	0	0	0.0102
Kurtosis	0.0002	0.2286	0.0001	0	0	0.2294
Observation	51	51	51	51	51	51

Source: Authors' Computation using STATA 17.0.

Table 3: Mann-Whitney Rank

Variable	P-value
NPM	0.0000
CR	0.1137
TATO	0.0000
FIRM SIZE	0.0001

Source: Authors' Computation using STATA 17.0.

Mann-Whitney Rank U Test: Based on Table 3, the Mann-Whitney Rank U test differentiates between two independent groups. Net Profit Margin (NPM) experienced a marked decline, with the mean dropping from 0.0208 before the pandemic to -0.0686, indicating a substantial reduction in profitability. This decline was statistically significant, as supported by the Mann-Whitney U test value of 0.0000. Similarly, Total Asset Turnover (TATO) decreased from a mean of 0.6525 to 0.3012, reflecting a significant drop in operational efficiency during the pandemic value of 0.0000. In contrast, the Current Ratio (CR), which fell slightly from 0.8018 to 0.6684, showed no statistically significant difference value of 0.1137, suggesting that liquidity remained relatively stable. Furthermore, firm size contracted significantly, with the mean decreasing from 1.3693 to 1.1679 p-value of 0.0001, illustrating the broader impact of the pandemic on business operations. Overall, these findings demonstrate that while profitability, efficiency, and firm size were adversely affected by the pandemic, liquidity showed relative resilience.

Variance Inflation Factors: The Variance Inflation Factors (VIF) values are presented in Table 4. None of the independent factors exceed a score of 10. This indicates that there is no multicollinearity among the independent variables.

Table 4: Variance Inflation Factor of the Independent Variables

Variables	Pre-Covid19 (Without Moderator)	Pre-Covid19 (With Moderator)	During Covid19 (Without Moderator)	During Covid19 (With Moderator)
CR	1.69	2.08	1.07	1.31
TATO	1.44	1.28	1.21	1.88
DTE	1.38	1.72	1.11	1.13
Firm Size	1.03	1.61	1.25	1.24
Mean VIF	1.38	1.67	1.16	1.42

Source: Authors' Computation using STATA 17.0.

Table 5: Fixed Effect Model and Pooled Ordinary Least Squares Diagnostic Result

Variable	Pre Covid19				During Covid19			
	Model 1		Model 2		Model 1		Model 2	
	Coefficients	Prob.	Coefficients	Prob.	Coefficients	Prob.	Coefficients	Prob.
CR	.0464166	0.071***	.0467621	0.071***	.0728962	0.149	.0627215	0.283
TATO	.1173507	0.102	.1107248	0.132	.1505535	0.316	.2166242	0.240
DTE	.0003237	0.034**	.0003189	0.039**	.0005525	0.412	.0004738	0.491
Firm Size	.0014434	0.005*	.0002147	0.006*	.0003603	0.761	.0011908	0.805
Constant	.0684519	0.175	.0529704	0.377	.1802916	0.002	.174489	0.003

Note: The signs *, **, and *** indicate the result is statistically significant at the 1%, 5%, and 10% levels respectively.
Source: Authors' Computation using STATA 17.0.

Discussion

Based on the findings presented in Table 5, it can be observed that variables such as CR (current ratio), DTE (Debt to Equity ratio), and firm size have a significant influence on the net profit margin (NPM) of Asia's aviation industry. Before the COVID-19 pandemic, the analysis indicated that the Current Ratio (CR) had a noteworthy influence on the net profit margin (NPM) with p-values of 0.071. This finding suggests that the degree of liquidity had a significant impact on financial performance, with a statistical significance level of 10%. Therefore, it provides support for hypothesis H1a. These companies are utilizing their existing assets to balance off their immediate debts, resulting in a favorable effect on their financial performance. Furthermore, this suggests that aviation companies can depend on their existing assets to repay their short-term debt sustainably. Furthermore, the correlation between CR and NPM is influenced by Passenger Demand. It demonstrates that there is support for H5a. The findings are consistent with the studies conducted by Rahma (2020) and Bachwera et al. (2014), which suggest that the current ratio formula affects financial performance and may lead to financial distress if an aviation company's management fails to effectively use current assets to repay short-term debt. The results of this study validate the assertions made by Sari and Putri (2016) that liquidity has a good impact on the performance of aviation companies.

However, the Total Asset Turnover (TATO) did not have a significant impact on the net profit margin. The p-values of 0.102 and 0.132 indicate that efficiency, as measured by asset turnover, did not have a significant influence on financial performance before COVID-19, regardless of the presence or absence of a moderator. This means that the hypotheses H2a and H5a are not supported. Nevertheless, the Debt-Equity ratio (DTE) had a substantial influence on NPM, as indicated by the p-values of 0.034. This underscores the significant impact on financial performance and implies that leverage had a crucial role before the pandemic. This finding suggests that the use of leverage has a significant impact on financial performance, with a level of significance of 5%. Furthermore, this supports hypothesis H3a. The findings indicate that before the COVID-19 epidemic, aviation companies demonstrated proficiency in handling their debt and equity, highlighting the substantial impact of the Debt-to-Equity (DTE) ratio on the operational success of 20 aviation companies in Asia. The results of this study are consistent with prior studies conducted by Naufal (2020) and Syawil et al. (2020), which demonstrated a direct correlation between leverage and a decrease in financial performance and financial

difficulties. In addition, the research conducted by Almajali et al. (2012) and Abbas et al. (2013) supports the connection between leverage and financial performance. In contrast, Lindawati (2020) presents opposing findings, suggesting that leverage has a negligible effect on financial challenges and proposes a negative relationship between the Debt-to-Equity ratio and company success.

Furthermore, the correlation between DTE and NPM is influenced by Passenger Demand. It demonstrates that there is support for H7a. Before the COVID-19 outbreak, the size of the firm had a substantial influence on its financial success. The p-values of 0.005 indicate that larger firms had a higher level of financial performance compared to smaller firms. This finding suggests that the size of a firm has a significant impact on its financial success, with a 5% level of significance. Therefore, it supports hypothesis H4a.

Analysis conducted during the COVID-19 epidemic revealed that the Current Ratio (CR), Total Asset Turnover (TATO), Debt-Equity Ratio (DTE), and firm size have little impact on the net profit margin (NPM). The coefficients had p-values of 0.149 and 0.283, both of which were greater than the 5% significance threshold. These findings suggest that the financial performance during the pandemic was not significantly influenced by liquidity, efficiency, leverage, and business size. Therefore, the outcome indicates that there is no support for H1b, H2b, H3b, and H4b. In addition, Passenger Demand did not affect or influence the connections between liquidity, efficiency, or leverage and financial performance. This suggests that variations in passenger demand have little effect on the influence of these financial considerations on performance. Thus, there is no support for H5b, H6b, and H7b. Amidst the COVID-19 pandemic, airlines saw significant cash challenges because of a sharp decline in passenger demand, coupled with the burden of substantial fixed expenditures and debt commitments. Although the airline industry experienced a decrease in operational costs as a result of fewer flights, its intricate cash flow system, which involved receiving ticket sales revenue in advance but having continuing expenses such as aircraft leases and maintenance, led to a shortage of available funds. The incapacity to promptly modify these predetermined expenses in reaction to the significant decline in demand worsened financial pressure, prompting some airlines to pursue government bailouts or resort to bankruptcy despite attempts to reduce expenses and adapt to the swiftly evolving circumstances. This indicates that, despite the worldwide economic downturn, the financial performance of the aviation industry in Asia remains unimpacted by fluctuations in passenger volumes or ticket revenue.

5. Conclusion and Recommendations

This research makes significant theoretical advances to the understanding of the financial performance of aviation enterprises in the Asia area. These contributions are made in various important ways. The study confirms earlier research by verifying that the pandemic and broader economic crises have negative effects on the risk profiles and profitability of airline operations. Furthermore, it offers a comprehensive and detailed comprehension of the factors that impact the financial performance of the aviation sector, considering both regular and pandemic circumstances. This gives useful knowledge and perspectives for both academic researchers and professionals in the industry. Moreover, this study provides valuable insights that may be used to shape government policies and regulatory frameworks. This, in turn, helps to improve economic competitiveness and meet market sensitivities. The findings provide a valuable point of reference for comprehending the effects of the epidemic on the financial industry and offer valuable insights into how investors have reacted throughout this time.

It can be concluded that during the COVID-19 pandemic, the link between liquidity and debt for airlines was not affected by passenger demand. This is because the travel industry saw an unprecedented collapse, which had a disproportionate impact on revenue, fixed costs, and debt obligations. In contrast to typical situations when varying passenger demand impacts cash flow and financial stability, the pandemic resulted in significant liquidity pressure and difficulties in managing debt that were not alleviated by changes in passenger demand (Gössling et al., 2020). Airlines encountered persistent high fixed expenses and significant debt, and the unprecedented nature of the crisis rendered traditional financial measures ineffective, so nullifying the customary mitigating impact of passenger demand (IATA, 2020).

The aviation industry plays a vital role in supporting the hotel and tourism industries, trade, and the overall economy. Nevertheless, the present condition of the airline business continues to pose difficulties for investors,

governments, management, suppliers, employees, and aviation firms alike. The COVID-19 epidemic has caused a substantial decrease in consumer confidence in the aircraft industry, which has been worsened by increased concerns about health. This study found that the financial performance of airline firms is influenced by various accounting criteria, including liquidity (current ratio), leverage (debt-to-equity ratio), and firm size. Considering that numerous airlines in Asia operate in emerging economies, managers and strategists should prioritize the preservation of crucial financial ratios to bolster competitiveness on both domestic and international scales. Furthermore, it is recommended that aviation operations resume while strictly following safety measures to protect public health. Furthermore, this report proposes that regulators and governments should act to alleviate the detrimental impacts of the pandemic on the transport and travel sectors. Efficient decision-making is essential for effectively handling economic disruptions induced by such events. Before instituting strict regulations, governments and international health organizations must thoroughly assess all commercial factors. For example, a suggestion to decrease the number of available seats to an average of 62% in comparison to the levels before the pandemic could be impractical (Gole et al., 2021). Although prioritizing passenger health is crucial, excessively stringent procedures may result in airlines becoming unprofitable or being forced to raise ticket prices substantially, which could lead to customer unhappiness and reduced patronage.

Additionally, this study applies Hawley's Risk Theory of Profit and Lancaster's New Theory of Demand to explain the financial outcomes of the aviation industry during the pandemic. Hawley's theory highlights that businesses are compensated for undertaking risks, which was evident as the pandemic magnified risks such as declining passenger demand and mounting debt obligations. Lancaster's theory underscores how reduced demand further exacerbates operational inefficiencies, as reflected in the decline in Net Profit Margin (NPM) from 0.0208 pre-pandemic to -0.0686 during, and the decrease in Total Asset Turnover (TATO) from 0.6525 to 0.3012. Despite these challenges, liquidity remained relatively stable, with the Current Ratio (CR) slightly decreasing from 0.8018 to 0.6684. The study thus emphasizes the need for airlines to adopt resilient financial strategies and robust risk management practices to navigate future disruptions effectively.

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