Risk and Investment Value Analysis in the U.S. Airline Sector of the Stock Market

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Abstract: Amid the evolving global economic landscape, the U.S. airline industry has undergone significant transformations, thus raising the need for comprehensive analyses of its investment value and inherent risks. Financial health, risk management strategies, and investment potential of key players in the U.S. airline sector were assessed, namely, Southwest Airlines, American Airlines, and Singapore Airlines. The research methodology involves a thorough evaluation of the financial ratios of these airlines, their strategic initiatives such as hedging, as well as their environmental, social, and governance (ESG) risk ratings. Key metrics such as Return on Invested Capital (ROIC), the Piotroski F-Score, Altman Z-Score, and debt ratios among others form the foundation of the analysis, providing insights into their operational efficiency, financial strength, and risk profiles. The study concludes that each airline exhibits a distinct financial profile with varying levels of investment potential. The choice between investing in these airlines hinges on individual investor preferences, risk tolerance, and investment horizons. The results reveal that Southwest Airlines and Singapore Airlines present lower risk profiles, potentially appealing to conservative investors, while American Airlines could appeal to more aggressive investors due to its high potential returns, albeit at a higher risk. Meanwhile, Singapore Airlines offers a balanced profile attractive to growth-focused investors. The importance of aligning investment decisions with personal investment objectives and risk tolerance was underscored, thereby providing valuable insights for potential investors in the U.S. airline sector.

Keywords: U.S. airline industry, financial health analysis, risk management strategies, investment potential

1.   Introduction

1.1. Background

A number of macroeconomic elements, including GDP growth, international commerce, and political stability, have an impact on the global economy, which is a complicated and linked system. One of the critical sectors underpinning this network is the airline industry, which is instrumental in facilitating business, tourism, and global connectivity. However, this essential industry faces multifaceted challenges. External factors such as fluctuating oil prices, the COVID-19 pandemic, geopolitical uncertainties, and currency exchange rate volatility significantly impact its operational environment. Additionally, the industry has been grappling with issues related to environmental

sustainability. The situation emphasized the importance of financial resilience and strategic adaptability. Given this context, understanding the financial health and operational performance of the airline industry becomes critically important. This insight will not only inform investment decisions but also provide valuable knowledge for airline executives and policymakers navigating this challenging landscape.

1.2. Related Research

Building upon the understanding of airlines' financial metrics, the influence of passenger perceptions, strategic flexibility, and common ownership in the financial markets was considered. Lu et al. analyzed changes in passengers' perceptions of COVID-19 risk during and after the outbreak, as well as changes in the share prices of U.S. airlines in the stock market over the same period. Studies have shown that US airlines have undergone structural changes in the stock market during the coronavirus outbreak. However, the findings also show that air travelers have gradually adapted and regained a sense of security after the coronavirus pandemic became more normal [1]. Claussen et al. find strategic flexibility beneficial for airlines seeking entry into unpredictable, fluctuating demand markets. It highlights the power of flexibility over mere operational efficiency, especially when demand forecasting proves difficult. From a managerial perspective, it underlines the strategic advantage of aligning flexibility with business analytics, thereby optimizing their capability to effectively handle market volatility [2]. Park and Seo use U.S. airline data to investigate how common ownership in financial markets impacts product market competition. The findings suggest that common ownership can lead to higher airfares and less competitive markets. As shareholders often hold stakes in competing companies, they may discourage strategies that promote competition, impacting corporate incentives. The trend of common ownership, potentially exacerbated by passive investments and industry consolidation, could have significant future implications for market competition [3].

Understanding the predictive power of operating performance, the role of liquidity and financial health, the importance of environmental efficiency, and the financial risk determinants in the airline industry are pivotal. The ability of operating performance to forecast future financial difficulties in the American airline industry was studied by Alan and Lapré. The findings indicate that there is a larger risk of financial trouble for airlines with poor revenue management, low aircraft utilization, and high operational complexity. Extreme service failures, such as more than two-hour delays and mishandled luggage, were, however, strongly correlated with a future state of financial trouble. Using this data, a forecasting model was developed that beats models based on financial ratios [4]. Research of Zarb underscores the crucial role of liquidity, solvency, and overall financial health in driving profit volatility in U.S. airlines. Significantly, it identifies key metrics such as the debt-to-equity ratio and the operating profit margin as important predictors of these profit fluctuations. The study's findings highlight these factors' importance in evaluating operational risk, contributing valuable insights to the understanding and prediction of profit volatility in the airline industry [5]. Xu et al. applied a specialized model to gauge the environmental efficiency of 12 U.S. airlines from 2013-2016, factoring in flight delays and greenhouse gas emissions. It uncovers substantial efficiency shifts when including flight delays and validates the significant impact of factors like fleet age, ownership type, and market share on airline performance [6]. Kiraci investigates financial risk determinants within low-cost airlines, analyzing data from 13 such companies between 2004-2017. Utilizing established risk measurement tools, Altman's Z-Score and Springate's S-Score, it identifies key financial risk factors including leverage, asset structure, firm size, profitability, and liquidity ratio, thereby offering valuable insights into risk management within this business model [7].

The researches conducted by Kang et al., Merkert and Swidan, provided invaluable insights on the influence of economic policy and oil price fluctuations, the role of hedging in risk management, and

the impact of different hedging strategies on profitability in the airline industry. Kang et al. scrutinize how economic policy uncertainty and oil price fluctuations affect U.S. airline stock returns at both industry and individual firm levels. The findings underscore that increases in oil prices, economic uncertainty, and jet fuel price volatility detrimentally impact airline stock returns. Interestingly, hedging future fuel purchases is shown to have a positive effect on smaller airlines, providing insights for airline managers, policymakers, and commodity investors [8]. Merkert and Swidan revisit risk management theories within the airline industry, specifically evaluating the efficacy of financial hedging in boosting operational profits. Analyzing six-year data from 100 global airlines, findings suggest that while fuel price hedging effectively reduces EBIT margin volatility, it doesn't significantly affect the profitability or operating costs. It also underscores the role of liquidity in capital-intensive industries, like airlines [9]. Swidan and Merkert also explore the impact of operational and financial hedging strategies on airlines amid recent hedging losses, volatile yet low fuel prices, and rising financial hedging costs. Analyzing data from 80 global airlines indicates that while operational hedging (e.g., aircraft engine commonality) can cut operating costs, it cannot fully manage jet fuel risk alone. The research suggests that a combined strategy of operational hedging and financial derivatives can effectively decrease unit costs and enhance profitability [10].

1.3. Objective

The primary objective is to undertake a comprehensive examination of the U.S. airline industry with an emphasis on understanding its financial health, risk management strategies, and potential investment value. Chapter two aims to conduct an in-depth analysis of the macro-environment, providing the foundational context for the industry. Chapter three is set to focus on a comparative evaluation of three significant players within the U.S. stock market - Southwest Airlines, American Airlines, and Singapore Airlines. Their financial performance, operational metrics, and risk management approaches will be scrutinized. In Chapter four, our goal is to present an investor-oriented perspective, exploring the investment value of these airlines for various investor profiles, from conservative to aggressive.

2. Analytical Method

The following section outlines the rigorous research methodology implemented to assess the risk and investment value of selected airlines within the U.S. stock market. The study analyzes Southwest Airlines, American Airlines, and Singapore Airlines, which serve as representative entities for the low-end, mid-range, and high-end service levels, respectively.

2.1. Data Collection

The initial stage of the research involves the collection of relevant financial data over a predetermined period. This data is primarily sourced from publicly accessible resources including company financial reports, as well as other notable financial databases. These resources provide a wealth of information concerning each airline's operational and financial performance, management policies, and practices relating to risk management, particularly hedging. In addition, ESG (Environmental, Social, and Governance) risk ratings will also be gathered, which offer insight into how the companies manage their environmental impact, social responsibilities, and corporate governance.

2.2. Analytical Measures

Once data is collected, various financial metrics are utilized to carry out a comprehensive analysis of the airlines.

2.2.1. Return on Invested Capital (ROIC)

ROIC is a metric for gauging a business's efficiency in turning a profit. A high ROIC often means that a business is effectively managing its operations and giving investors favorable returns. A company's falling profitability may be indicated if ROIC is dropping over time.

$$ROIC = \frac{Net\ Operating\ Profit\ after\ Tax}{Total\ Invested\ Capital} \tag{1}$$

2.2.2. F-Score

The Piotroski F-score is an aggregate measure of the financial strength of a company. A high F-score suggests a company is financially strong and likely to perform well in the future. A low F-score may suggest a company is financially weak and could face challenges ahead.

2.2.3. Z-Score

The Altman Z-score predicts the likelihood of bankruptcy within two years. A Z-score above 3 shows financial strength, while one below 1.8 implies a high likelihood of bankruptcy. Investors can use this score as a valuable tool to evaluate a company's risk and financial health.

2.2.4. Current Ratio

A liquidity ratio used to assess a company's capacity to meet short-term obligations is the current ratio. A ratio of less than one suggests that the business may be experiencing liquidity problems, while a ratio of more than two may indicate ineffective use of current assets.

$$Current\ Ratio = \frac{Current\ Assets}{Current\ Liabilities} \tag{2}$$

2.2.5. Debt-to-Assets Ratio & Debt-to-Equity Ratio

A high debt-to-assets ratio suggests a company has financed a significant portion of its assets through debt, which could pose a risk if business conditions worsen. The debt-to-equity ratio reflects the balance between debt and equity in a company's financing. A high ratio suggests that the company is aggressively financed by debt, which can be risky.

$$Debt-to-Assets\ Ratio = \frac{Total\ Debt}{Total\ Assets} \tag{3}$$

$$Debt-to-Equity\ Ratio = \frac{Total\ Debt}{Total\ Stockholders'Equity} \tag{4}$$

2.2.6. Profit Margin

A company with a high profit margin typically has a cost advantage, better control over its costs, or a differentiated product. If the profit margin is decreasing, the company might be facing increased competition, increased costs, or other negative trends.

$$Profit\ Margin = \frac{Net\ Income}{Revenue} \tag{5}$$

2.2.7. Hedging or Not

Hedging can be a valuable risk management strategy for airlines. By hedging, airlines can offset the risk of fuel price fluctuations or currency exchange rate volatility. If a company doesn't hedge, it may be more exposed to these risks, which can lead to higher volatility in earnings.

2.2.8. ESG Risk Rating

The ESG risk rating reflects how well a company manages its environmental, social, and governance risks. A company with a high ESG rating is likely to be more sustainable in the long run, attract more investors, and be more resilient to potential ESG-related disruptions or scandals.

2.3. Analysis and Interpretation

After these measures are computed, the data will undergo rigorous analysis. Descriptive statistics and correlation analyses will be used to make sense of the data, identify relationships, and make predictions about future trends. Inferences will be drawn, taking into account the financial and operational aspects of the airlines, as well as the inherent risks and investment values of their stocks.

The result will be a comprehensive, multi-dimensional evaluation of the investment value and risk of Southwest Airlines, American Airlines, and Singapore Airlines in the U.S. stock market. Through the research, investors and other stakeholders can gain deeper insights into these airlines' potential risks and rewards, thereby enabling informed decision-making.

3. Comparative Analysis

The empirical data of the study are drawn from a variety of trusted sources such as Yahoo Finance, gurufocus, and the annual reports of Southwest Airlines, American Airlines, and Singapore Airlines. The data utilized to compute the ROIC are trailing twelve months (TTM) data, while the remaining measures are based on data from the first quarter of 2023, as shown in Table 1.

Table 1: The comparison of financial ratios of the three companies.

Company	Southwest Airlines	American Airlines	Singapore Airlines
ROIC (TTM)	2.33%	4.51%	6.13%
F-Score	6.00	7.00	5.00
Z-Score	1.95	0.77	0.97
Current Ratio	1.26	0.72	1.41
Debt-to-Assets Ratio	26.38%	64.28%	31.36%
Debt-to-Equity Ratio	91.01%	-743.87%	76.04%
Profit Margin	2.65%	3.39%	12.13%
Hedging or not	yes	no	yes
ESG Risk Rating	32	29	27

Weighted Average Cost of Capital (WACC) for Southwest Airlines, American Airlines, and Singapore Airlines are 5.88%, 4.91%, and 6.05%, respectively. American Airlines, at 4.91%, has the lowest WACC among the three, indicating the least cost of capital, whereas Singapore Airlines displays the highest at 6.05%.

The Return on Invested Capital (ROIC) of Southwest Airlines is 2.33%, which is the lowest among the three airlines, indicating that Southwest is generating the lowest return on its invested capital. In

contrast, Singapore Airlines, with an ROIC of 6.13%, leads the group, outperforming American Airlines' ROIC of 4.51%.

The Piotroski F-Score, a gauge of financial strength, ranges from 5.00 for Singapore Airlines to 7.00 for American Airlines, with Southwest Airlines falling in the middle with a score of 6.00. This suggests that, based on the F-score, American Airlines is in a stronger financial position than the other two airlines.

The Z-Scores, which are indicators of bankruptcy risk, are 1.95 for Southwest Airlines, 0.77 for American Airlines, and 0.97 for Singapore Airlines. Given that a Z-Score below 1.8 suggests a high likelihood of bankruptcy, both American Airlines and Singapore Airlines seem to be at financial risk, with American Airlines displaying the highest risk.

As for liquidity, measured by the Current Ratio, Singapore Airlines leads the group with a ratio of 1.41, followed by Southwest Airlines at 1.26. American Airlines lags behind with a ratio of 0.72, indicating a potential liquidity issue.

Concerning the Debt-to-Assets ratio, Southwest Airlines (26.38%) and Singapore Airlines (31.36%) have comparatively lower levels of debt financing than American Airlines (64.28%), suggesting a lower financial risk. For the Debt-to-Equity ratio, American Airlines' negative ratio of -743.87% suggests an aggressive debt financing strategy, while Singapore Airlines' 76.04% and Southwest Airlines' 91.01% present a balanced approach.

In terms of profitability which is measured by Profit Margin, Singapore Airlines demonstrates a substantial lead with a Profit Margin of 12.13%. American Airlines stands at 3.39%, while Southwest Airlines lags with a margin of 2.65%.

On the risk management front, both Southwest Airlines and Singapore Airlines have employed hedging strategies to mitigate risks like fuel price fluctuations. In contrast, American Airlines has chosen not to hedge, potentially exposing itself to more risk.

Lastly, the ESG Risk Ratings for the three airlines are relatively close, with Singapore Airlines presenting the lowest score at 27, followed by American Airlines at 29, and Southwest Airlines at 32. A lower ESG risk rating is indicative of better management of environmental, social, and governance risks.

In conclusion, the collected data reveals a diverse performance profile for each of the three airlines in terms of their financial health, profitability, and risk management strategies. These results will be analyzed further in the subsequent sections.

4.   Investment Advice

4.1. Operational and Strategic Analysis

Based on the above analysis and comparison of Southwest Airlines, American Airlines, and Singapore Airlines, it can glean several important investment implications. This perspective provides insights into not only their financial performance but also the operational and strategic factors driving those outcomes.

From a business perspective, each airline's financial performance is a reflection of its operational efficiency and the success of its strategic initiatives. Singapore Airlines, for example, boasts a high ROIC and profit margin. The data indicate a highly effective use of invested capital and superior profitability, suggesting robust operational management. This impressive performance could likely be credited to their business model focused on delivering premium services, maintaining an efficient fleet, and the strategic selection of profitable routes. Conversely, Southwest Airlines' low ROIC and profit margin may signal room for improvement in its operational efficiency and a potential need to redefine its business strategy.

Additionally, the debt-to-equity ratio of these airlines provides insight into their financial strategy. American Airlines' high negative ratio signifies aggressive leverage, potentially pointing towards an ambitious expansion strategy or capital-intensive fleet modernization. However, this high level of borrowing may also raise concerns over the company's long-term financial health.

The airlines' risk management strategies, specifically their approach towards hedging, offer an interesting view of their approach to external risks such as fuel price volatility. Southwest and Singapore Airlines' choice to hedge could suggest a more cautious management style, aimed at providing stability in financial performance despite market uncertainties. In contrast, American Airlines' decision to abstain from hedging might hint at a risk-tolerant approach, possibly with the intention of capitalizing on market opportunities to drive higher returns, despite the potential for increased volatility.

4.2. Investment Considerations Based on Investor Profile

From an investor's standpoint, the choice between investing in these three airlines would be dictated by their individual risk tolerance, investment objectives, and investment horizons. Conservative investors might find Southwest Airlines or Singapore Airlines appealing. Their risk mitigation strategies, manageable debt ratios, and healthy liquidity position all point towards lower risk and could potentially provide steady returns over a longer-term horizon. Additionally, Southwest Airlines, with a lower ESG risk rating, could be particularly attractive to socially responsible investors who prioritize sustainable business practices.

In contrast, American Airlines could appeal to more aggressive investors. While the company's high debt ratios and low Z-score indicate elevated financial risk, its relatively robust F-score and higher ROIC could suggest promising returns if the company can successfully manage its financial health and continue to perform well operationally. Consequently, investors comfortable with higher risk and betting on the company's turnaround strategy could see potential value in American Airlines' stock.

Singapore Airlines, on the other hand, seems to present the best of both worlds. Its high profit margin and ROIC signal strong profitability, potentially making it an attractive option for growth-focused investors. However, its relatively lower F-Score and Z-Score hint at possible financial risks that investors should factor into their decision-making process.

While each airline presents a distinct financial profile and unique investment potential, it is essential for investors to align their investment decisions with their personal risk tolerance, investment objectives, and views on the future of both the individual airlines and the airline industry as a whole. It's also important to remember that a balanced and diversified portfolio is key to mitigating risks and achieving financial goals. Investing in the airline industry should be considered a part of a broader investment strategy that fits into one's overall financial plan.

5. Conclusion

The research has undertaken a comprehensive examination of the U.S. airline industry, with a particular focus on financial health, risk management strategies, and investment value. Specifically, the study delved into the macro-environment in which the industry operates, conducted an in-depth comparative analysis of Southwest Airlines, American Airlines, and Singapore Airlines, and provided insights from an investment perspective.

Among the main findings, the study identified varying levels of financial performance among the three airlines. For instance, Singapore Airlines exhibited strong profitability and efficient use of capital as reflected in its high profit margin and ROIC. In contrast, Southwest Airlines displayed areas for improvement in operational efficiency. American Airlines, on the other hand, has adopted an

aggressive financial strategy as indicated by its high debt ratios but faces elevated financial risk as demonstrated by its low Z-Score.

Furthermore, the analysis illuminated the different risk management approaches adopted by the airlines, with Southwest and Singapore Airlines employing hedging strategies to mitigate external risks such as fuel price fluctuations, while American Airlines has opted for a risk-tolerant approach.

These findings yield significant implications for investors and industry stakeholders. Investors need to align their investment decisions with their risk tolerance, objectives, and views on industry prospects. For conservative investors, Southwest or Singapore Airlines may be more appealing due to their risk mitigation strategies. Aggressive investors might find value in the potentially high returns from American Airlines, provided they are willing to assume higher risks.

For the industry, it is imperative to continually monitor and adapt to the macro-environment, optimize operational efficiencies, and implement effective risk management strategies. Moreover, companies should consider sustainability and ESG factors, as these have become increasingly important to investors.

In conclusion, the research provides invaluable insights into the U.S. airline industry's financial landscape, serving as a resource for investors in making informed decisions and for industry participants in navigating the complexities of the market.

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