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# *Research on the Debt Levels of Firms in the Aviation Industry*

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***Abstract:*** Numerous reasons contribute to the liabilities of a firm in the aviation industry. As a capital-intensive industry, the aviation industry has long faced high liabilities caused by the cost of purchasing necessary means of production. Also, the industrial feature that the aviation business has in its off-season and peak season has brought uncertainty to the industry. In addition, it has also experienced increasing pressure due to the decreasing travel and transport demands during and after the COVID-19 pandemic. Considering the reasons above, the debt management ability of an airline has become more essential than before to investors. This research will compare and analyze the debt level of sample firms in the aviation industry, and provide a basic overview of the sample firms' business situation through utilizing a quantitative method and several indicators. The conclusion is that the differentiation in debt levels results from the differences in industrial features, firm situations, and operating and investment activities.

***Keywords:*** Debt Level, Aviation Industry, Liability Management

## 1. Introduction

The development of an aviation firm relies heavily on its scale and sustainable market competitiveness, and these two factors are affected by its debt level to a large extent. Given that both infrastructure and aircraft cost a large amount of money, and it is impossible for airlines to afford expansion based solely on their operating profits, airlines have to rely on debts to operate. While this situation is long-lasting, other factors like global or geographical safety or health emergencies may also negatively influence the operation of airlines. Thus, maximizing the returns, which is the goal of an airline, will require appropriate debt management [1].

While debt management can ensure the firm has sufficient development funds, there are also non-negligible drawbacks in doing so, and, due to the potential risk debt management brings, these risks are more likely to be ignored. Managing risks and hazards, however, has always been essential to airlines [2]. Thus, a clear understanding of the debt level of the firm and efficient debt management is necessary.

This research aims to provide a more comprehensive view of the debt levels of airlines. From a theoretical perspective, this research, by way of analyzing and comparing the debt levels of airlines, will be able to point out the influences of liability composition on enterprise management, and thus contribute to providing a better way to tackle the existing issues.

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As part of the quantitative research, four indicators will be utilized to analyze eight firms of two industries. The four indicators are the debt-to-equity ratio, the liquidity ratio, the Net Debt, and the EBIT. Among the eight firms mentioned, four of which are competitors in the aviation industry and the other four in the manufacturing industry as a comparison to the precious four from an industrial perspective.

The D/E ratio measures the leverage and debt burden of a firm. Generally, a relatively low ratio will be beneficial to the firm since it may be difficult for a firm with a high D/E ratio to pay off existing debts and raise future capital. The quick ratio formula for calculation divides the liquid asset by its current liabilities. As an indicator of the overall financial strength of a firm, it also measures if the firm is capable of meeting its obligations with liquid assets. This research defines Net Debt as total debt minus cash and short-term investment. Also, the Net Debt/Market Cap and Total Liabilities/Market Cap ratios measure the ability to utilize the stock market to improve its liability composition on its balance sheet.

## 2. Aviation Industry Overview

Table 1: Sample firms selected for comparison.

| | | | | | |
|---|---|---|---|---|---|
| Aviation (A) | Name of the Firm | Alaska Air Group | JetBlue Airways | Delta Air Lines | United Airlines |
| | Ticker symbol | ALK | JBLU | DAL | UAL |
| Manufacturing (B) | Name of the Firm | Caterpillar Inc | The Boeing Company | Paccar Inc | Cummins Inc |
| | Ticker symbol | CAT | BA | PCAR | CMI |

DAL and UAL are service airlines with the largest market capitalization among listed companies in the aviation industry. ALK, while operating a business model between full-service and budget airlines, is running relatively well, and it is one of the first airlines to benefit from the economic comeback of medium scale. JBLU is a low-cost carrier. Having similar operating scales, these first two and the last two firms are considered appropriate samples for comparison.

In addition to the listed firms, four leading enterprises of the manufacturing industry (see Table 1) will be analyzed as a representation of the large-scale manufacturers that also have high debt levels like airlines.

There are two reasons that render the debt problems of aviation firms noteworthy. On one hand, as a capital-intensive industry, aviation firms have the feature of high liability ratio. On the other hand, the aviation industry has suffered from the COVID-19 pandemic, and, considering certain data, it has not recovered yet.

While having to purchase planes, fuel, hangars, and other means of production, it is not surprising that airlines have some of the highest D/E ratios. The escalation in the jet oil price has also contributed to huge losses for airlines [3]. Also, as a service industry that gets into debt before generating income, aviation firms face the pressure to create sustainable revenue to pay off previous debts. Aircraft purchases and renewals are usually financed by profits in previous years [4]. In addition, the seasonality of the aviation business may bring uncertainty, causing the cash flows of the companies to fluctuate.

The COVID-19 pandemic has caused unprecedented impacts on the aviation industry [5]. Along with the implementation of travel restrictions in various regions and the decrease in travel demand, airlines have suffered a severe crisis. Even though idling ships can decrease operating costs, the

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withdrawn capacity will still cause a huge loss in revenue for carriers [6]. Furthermore, the generation of a recovery plan for the aviation industry is also complex, requiring accurate re-planning of resources [7].

To mitigate the negative impacts mentioned above, airlines have to borrow money. The newly increased debt will inevitably bring more operating burden to the airlines. Also, a change in debt structure is likely to increase the risks firms are taking [8]. Even if travel demand experienced a comeback along with the economy, and airlines are operating at an efficient level, there is still to need for an accurate plan to deal with the debts.

## 3. Comparative Analysis

### 3.1. Comparison in Short-Term Debt Paying Ability

While some firms having huge debts also have sufficient high-liquidity assets, these firms do not have difficulties paying off short-term debts. These assets include cash, flexibly-traded investment products, short-term receivables, and others. Thus, a comparison in liquidity ratios is necessary.

Table 2: Quick ratios of the four firms selected.

| Companies | Alaska Air Group | JetBlue Airways | Delta Air Lines | United Airlines |
|---|---|---|---|---|
| 2023-12-31 | 0.58 | 0.57 | 0.34 | 0.76 |
| 2022-12-31 | 0.65 | 0.49 | 0.45 | 0.95 |
| 2021-12-31 | 0.97 | 0.93 | 0.71 | 1.14 |
| 2020-12-31 | 0.92 | 1.22 | 1.05 | 1.09 |
| Average | 0.78 | 0.80 | 0.64 | 0.98 |

Table 2 above shows the quick ratios of the four firms selected. The status of the four airlines is not optimistic, despite the decreasing impact of the pandemic. Between 2020 and 2023, the quick ratios of the airlines all experiences a drastic decline regardless of their operating scale or debt size. Among them, DAL even slipped to the brink of a short-term payment crisis. This situation suggests that the aviation industry has experienced a decline in solvency and does not show a tendency to recover.

### 3.2. Comparison in the Ability to Covering Debts Through Operating Activities

The net-debt-to-EBIT ratio and the EBIT cover interest expense will be utilized to analyze the debt levels relative to the earnings of each airline, comparing the ability to cover debts through operating activities.

Table 3: Net-debt-to-EBIT ratios of the four firms selected.

| Companies | Alaska Air Group | JetBlue Airways | Delta Air Lines | United Airlines |
|---|---|---|---|---|
| 2023-12-31 | 4.87 | -30.78 | 3.81 | 4.27 |
| 2022-12-31 | 7.90 | -11.03 | 8.55 | 8.60 |
| 2021-12-31 | 1.30 | -27.59 | 14.58 | -14.61 |
| 2020-12-31 | -0.98 | -1.56 | -1.46 | -1.09 |
| Average | 3.27 | -17.7 | 6.37 | -0.71 |

Table 3 above shows the net-debt-to-EBIT ratio of the four selected firms. While that of JetBlue Airways remains negative for four years, losing its capability to improve liability composition by

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operating. This may be a result of the business model of the firm, which is operating as a budget airline, and still, there are no signs of future improvement. However, the other firms have experienced an increase in their net-debt-to-EBIT ratio, implying an increasing profitability. If they remain on the trend, the firms may form a relatively reasonable coverage of debts in the following one to two years.

Nevertheless, considering the escalating tension of international geopolitics, and other emergent factors, airlines may still face potential risks in the future despite the recovery of the aviation industry. The EBIT covers interest expenses and can provide information on the firm's ability to cope with the potential debt crisis.

Table 4: EBIT-to-interest expense ratios of the four firms selected.

| Companies | Alaska Air Group | JetBlue Airways | Delta Air Lines | United Airlines |
|---|---|---|---|---|
| 2023-12-31 | 4.44 | -0.59 | 7.72 | 2.91 |
| 2022-12-31 | 1.84 | -1.63 | 2.86 | 1.59 |
| 2021-12-31 | 6.38 | -0.37 | 1.31 | -0.62 |
| 2020-12-31 | -20.15 | -9.58 | -15.78 | -7.89 |

Out of the same reasons mentioned above, the ratios of JetBlue Airways lose significance in comparison, as Table 4 shown. In an overall view, the airlines all experienced an improvement after the pandemic, and their Ebit covers interest expenses are at a healthy level. Specifically, Delta Air Lines has shown a strong ability to pay off interest as one of the leading airlines in the industry.

### 3.3. Comparison in the Ability of Covering Debts Through Investing Activities

For a company with a reasonable amount of debt and sufficient short-term solvency, the free cash flow generated by EBIT can repay the debt, which is the best situation in the interests of shareholders and creditors. However, when the free cash flow is unable to cover the debts, issuing new shares and financing are ways to tackle to problem.

Pricing new shares is especially critical: a high price is beneficial for shareholders, while a low price will dilute the shareholders' equity. In addition, a firm without sufficient cash reserves may become illiquid [9]. If a debt crisis occurs, and the price of the firm's shares has declined to the extremely low level, the firm will face bankruptcy for being unable to issue new shares. Net Debt/Market Capitalization and Total Liabilities/Market Capitalization will be utilized to compare the abilities of companies to cover debt through investing activities. The former can reflect the debt pressure the company is facing and the latter can reveal the scale of the company's balance sheet.

Table 5: Net debt-to-market capitalization ratios of the four firms selected.

| Companies | Alaska Air Group | JetBlue Airways | Delta Air Lines | United Airlines |
|---|---|---|---|---|
| Market Cap (24-5-12) | $5,553 | $1,963 | $33,943 | $17,335 |
| Net Debt (23-12-31) | $2,030 | $3,817 | $24,512 | $22,021 |
| Total Liabilities | $10,500 | $10,516 | $62,539 | $61,780 |
| Net Debt/Market Cap | 37% | 194% | 72% | 127% |
| Total Liabilities/Market Cap | 189% | 536% | 184% | 356% |

As shown in Table 5, the four airlines all have high Net Debt/Market Cap ratios. JBLU and UAL's net debts are larger than market capitalization, which places the two companies in a high-risk situation; those of DAL and ALK are also relatively high. Similarly, JBLU and UAL have extremely high total

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liabilities/ market capitalization ratios, and those of ALK and DAL are relatively lower, implying that airlines still have not recovered from the financial distress caused by the COVID-19 pandemic.

### 3.4. Comparison with the Manufacturing Industry

The aviation industry and the manufacturing industry are both heavy-asset industries, which indicates that firms in these two industries may both have high debt levels. Take Alaska Air Group (ALK) for example. As a company of medium scale, the Short-term Debt/Current Portion of Long-term Debt on its balance sheet was $353 million by the end of 2023, and the Long-term Debt is $2.18 billion. Conversely, those of The Boeing Company (BA), one of the leading enterprises in the manufacturing industry, are much higher, at a level of $5.2 billion and $47.1 billion.

In addition, manufacturing businesses require a large amount of long-term capital for further financial performance improvement, which is similar to the aviation industry [10]. While these two companies have the possibility to be exceptions, comparing two groups of companies of different scales may render more accurate conclusions.

Table 6: Comparison of D/E ratios.

| | A Group | | | | B Group | | | |
|---|---|---|---|---|---|---|---|---|
| Symbol | ALK | JBLU | DAL | UAL | BA | CAT | PCAR | CMI |
| 2023-12-31 | 2.55 | 3.15 | 5.63 | 6.63 | -8.95 | 3.49 | 1.57 | 2.62 |
| 2022-12-31 | 2.72 | 2.66 | 9.98 | 8.77 | -9.63 | 4.16 | 1.53 | 2.35 |
| 2021-12-31 | 2.67 | 2.54 | 17.64 | 12.56 | -10.24 | 4.02 | 1.55 | 1.87 |
| 2020-12-31 | 3.70 | 2.39 | 45.93 | 8.99 | -9.31 | 4.11 | 1.72 | 1.81 |
| Average | 2.91 | 2.69 | 19.80 | 9.24 | -9.53 | 3.95 | 1.59 | 2.16 |

Table 6 shows a horizontal comparison of the D/E ratio between eight companies and a vertical comparison of each company in the past four years, which are both factors used to compare their debt scale. A group includes four aviation companies and B group includes four manufacturing companies.

While BA has had a continuous negative equity and D/E ratio in the past four years, it is obvious that it is suffering from a financial anomaly, and its ratios lose the significance of discussion. Still, looking at the table, DAL, and UAL, as full-service airlines, have an extremely high debt level compared with the other firms selected. This situation has not recovered until the end of 2023, and thus it is unlikely that they will experience a recovery in 2024. Conversely, ALK and JBLU have fared relatively better in debt, implying that medium-scale firms may be better at recovering from the recession during the pandemic than larger carriers such as UAL and DAL.

In addition, comparing the two groups, firms in the manufacturing industry have a lower average D/E ratio than those of the aviation industry, which can be interpreted as heavy manufacturing industries like machinery have recovered better from the pandemic.

## 4. Conclusion

Based on the findings above, this research has the following conclusions: Firstly, debt levels are associated with the situation of certain industries. Considering the capital intensiveness and uncertainty of the aviation industry, it is normal for airlines to have relatively high debt levels.

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Secondly, the aviation industry has suffered more damage than other heavy-asset industries like manufacturing during and after the pandemic. Its total liability level remains high, and its operation still faces uncertainty. Thirdly, differentiation is revealed through the different debt levels of the selected airlines. Though low short-term debt-paying ability is prevalent in aviation firms, the difference in operating situation indicates differences in profitability and the ability to cover debts through investing activities.

The following shortcomings exist in this research: Firstly, the sample size selected in this study is too small to cover the entire air transport industry; thus, there may be a few reasons that contribute to the existing situation but are neglected. Secondly, the indicators selected in this study are too few to make a complete and comprehensive analysis of the firms selected; thus, the conclusion of this research may not be objective enough.

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