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Financial Sustainability of Operating Efficiency and Company Values in Selected North American Airlines Between the Periods of 2019 and 2022

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DOI: <https://doi.org/10.69978/jaoam.V3.I2.3>

Abstract.

The civil aviation world witnessed many changes in the last 25 years. Maybe, the worst of them is the crisis of COVID-19 and after. This study aims to shed light on this period in the United States. There are 6 United States airlines with an approximately %95 market cap of USA in total in this analysis. Through the explanative forces of the Tobin Q and Dupont Analysis (ROE), the study completes a gap toward operational efficiency and corporate value for this specific period. The research findings prove this situation regarding the dramatic drop in ROE and Tobin Q values. At the end of the analysis, it concludes that the COVID-19 process dramatically hit the financial structures of the American Air carriers with a sharp decline in revenues. It will be another undeniable reality that ticketing policies have strategic importance if it is concentrated on the other reality that only one financial resource of air carriers' tickets. This crisis also hit this structure. Some policy implications are realized for air carriers.

Keywords: United States Airlines, Dupont Analysis, Tobin Q Ratio.

1. Introduction

The economics of the airline industry has many roots depending on the changing nature of air transportation. The airline industry is a key player in the global economy, operating in a constantly changing environment. Effective managerial strategies are crucial for improving operational efficiency and sustainably safeguarding company values. Competition is high, costs are volatile, and external factors can impact operations [1]. Management involves strategic planning to make effective decisions and enhance operational efficiency in this complex environment [2]. Factors such as airline companies' strategic visions, fleet management, pricing strategies, and customer relations are crucial in determining operational efficiency. The changes in technological, political and economic world conjuncture can be some sources of forecasted or unforeseen crises. Civil aviation dramatically suffers from meteorological changes, pandemic and epidemic considerations and human factors related to safety and security outside these conditions. Every air carrier has to work under these circumstances. The budget structure of airline companies should allow the necessary flexible, efficient and effective interventions in these negative situations to achieve financial sustainability. Also, the financial and legal burdens of national, regional and international aviation and trade regulators have impacts on this business.

Davis and Stone [3] analyze corporate financial structure and financial stability in crisis time. Well-managed operations can provide a significant advantage in reducing costs, increasing customer satisfaction, and achieving sustainable growth [4]. First of all, they define, examine and classify the phenomenon of financial crisis with macroeconomic variables such as demand, consumption and investment and then they concentrate on the cash flows of banking companies. Crockett [5] underlines the importance of market discipline and sustaining financial stability in risky times of crisis although the relationship between the progress of financial depression and the applications of market discipline can sometimes be inconsistent. Allen and Gale (2004) concentrated on the relationship between competition and stability, competition is good for static efficiency but stability. Even though a great majority of research is designed for financial markets, after the deregulation movement in the US Airline Industry of 1978, airline financial markets felt the impacts of financialisation, neoliberalism and globalism, therefore financial stability became a matter. As it's seen in Figure 1, all of the economic catastrophes of the world have dramatic impacts on civil aviation.

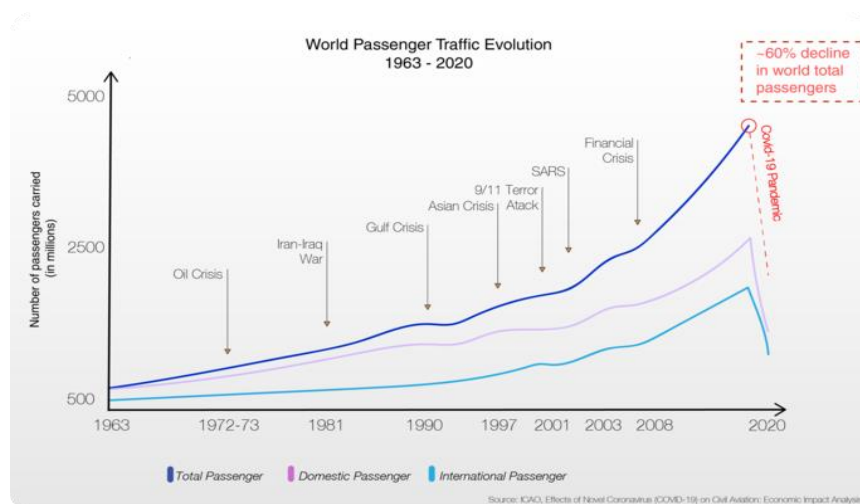


Figure 1. The Crisis in the Airline Industry.

Source: International Civil Aviation Organization, Access time: 13.11.2023.

In light of the arguments above, this paper aims to make an easy and efficient financial analysis of Delta Airlines, United Airlines, Southwest Airlines, American Airlines, Alaska Airlines, and Jetblue Airways, which are already six giants of US Air Space in terms of passenger transportation via Dupont and Tobin q analysis for Covid-19 period. These airline companies represent also approximately %95 of all US Civil Airlines Force . Besides, it answers the question of “ Which variables are more efficient in crisis time like COVID financially?” By investigating this question, the design of the research will fill a gap in which policies will be beneficial in air passenger transportation in catastrophic times. However, the main causes of the selection US Airline industry are not only collected under the umbrella of aviation science but also the strict, sound and wide structure of US financial markets is another cause depending on true and correct financial reporting standards, corporate governance structure and auditing quality of the US.

In the literature review section of the paper, there is an analysis of the US economy and airline sector financially. In the methodology section, the paper concentrates on the main findings of Tobin Q and Dupont's Analysis of selected airline companies and the total industry. Discussions will take their place after methodological concentration, conclusions and policy implications will be given in the last section.

2. Literature Review

The literature review of this research can be examined under three titles. First of all, it concentrates on the development of airline and airline financial approaches. Secondly, it draws a picture of financial stability in hardtimes such as crisis and Covid 19 crisis. Thirdly and lastly, it explains the place of Tobin Q and Dupont's Analysis place in the measurement of financial stability. These two ratios are selected not only for their features in financial management but also for business management.

The industry must cope with rapidly changing demands and regulations [6]. In the constantly changing and competitive airline industry, management plays a critical role in making strategic decisions, directing operations effectively, and gaining a competitive advantage [7]. Factors such as fleet management, cost control, route planning, and customer relations are strategic decisions that directly impact business efficiency and financial sustainability in the airline industry.

To adapt to constantly changing dynamics, flexible business strategies are required. Business management plays a crucial role in creating and implementing these strategies [7]. Fleet management and route planning are effective strategies for airlines to reduce costs and increase profitability by optimizing operational efficiency and quickly adapting to changes in demand and competition.

Customer relations is a crucial factor in the airline industry as it affects not only the relationship between a service provider and the consumer but also financial sustainability by creating loyal customer bases. Well-managed customer relationships increase customer satisfaction and strengthen brand loyalty, forming the basis for long-term income and financial stability [6].

The air industry has got a lot of different segments. The following illustration by Feng and Wang [8] gives a lot of insights into the air industry and its financial purposes.

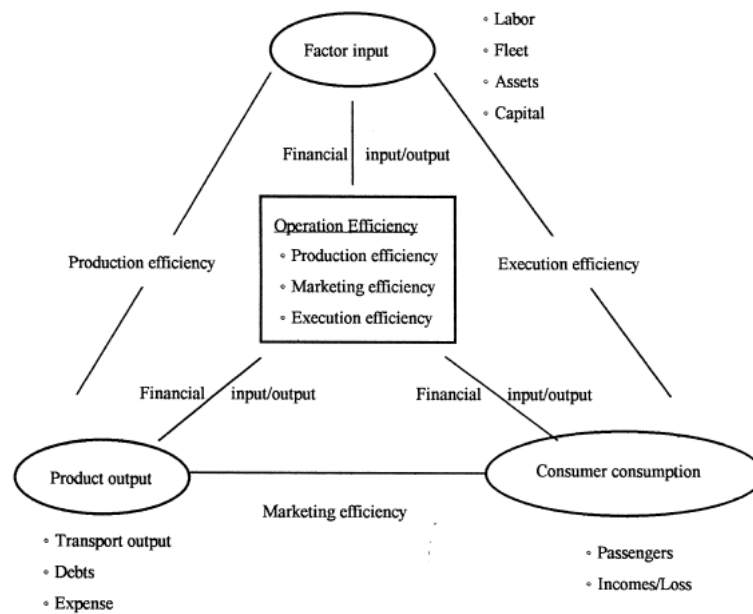


Figure 2. A conceptual framework of the operation performance evaluation for the air industry.

Resource: Feng and Wang, [8]: 135.

Airlines often have to make significant capital investments, making debt levels and financial leverage a crucial focus. While high levels of debt can lower the cost of capital, they can also increase the company's susceptibility to financial risks [9]. Effective liquidity management is crucial in mitigating uncertainties in the airline industry. Maintaining a strong cash position not only provides operational flexibility but also enhances a company's resilience during times of crisis (Williams, 2021). Although the American airline industry has demonstrated resilience to financial crises in the past, recent events such as the September 11 attacks and the COVID-19 pandemic have had a profound impact on the sector [10]. In this context, the financial structure and management strategies of a company play a critical role in determining its ability to withstand crisis periods. The airline industry is a service industry, it has many specific dimensions such as airport management, ground handling and ramp services, and air cargo business. The dimensions of air transport financial indicators can be summarized in the following table.

Table 1. Financial Indicators of Air Transport

Production Performance Indicator	Marketing Performance Indicator	Execution Performance Indicator
Labor productivity	Flight marketing capability	Labor execution capability
Fleet productivity	Operation kilometres marketing capability	Fleet execution capability
Asset productivity	Seat marketing capability	Return on Investment
Short term liquidation	Profitability	Assets and stockholder turnover
Short term solvency	Debts turnover	

Resource: Feng and Wang, [8]: 135.

Specified financial indicators are given into a form by Riley et al. [11] paper, these financial indicators were found to divide cargo-specific variables such as load factor, and available ton-miles to stock prices of selected cargo airlines. Scheraga [12] utilizes similar variables in his analysis, which can be counted as state ownership or ownership structure, international operations, load factor, non-flight assets, passenger revenue and operating revenues. Caobianco and

Fernandes ([13]:429) underline the importance of assets and asset utilisation, so (ROA= Return on Assets) in airline capital structure management. Besides these, the quality and quantity of freights and baggage, cancellation and delay processes, revenues, and net income can be utilizable in airline financial understanding [14]. Behn and Riley ([15]:29) state that customer satisfaction, load factor, market share, and available ton miles are contemporaneously associated with operating income and revenues and that customer satisfaction and available ton miles are contemporaneously associated with expenses. Without a fare analysis, the financial airline evaluation will be missing one. The operation costs have a positive relationship with airfares, on the other side, market share and market concentration follow a negative correlation trend in financial distress times ([16]:238). On the other hand, Busse ([17]: 298) competitive airline prices are products of worse financial conditions such as highly leveraged airline firms on specific routes. To define the financial efficiency of airlines on a country basis, Pires and Fernandes [18] utilize the Malmquist index, which is a form of capital structure management. According to the Malmquist index, the countries can compare depending on their productivity and efficiency. Size, fleet and intangible assets and indebtedness are other important factors in the definition of financial efficiency. Other important financial analyses of airlines are jet policies and hedging. In the analysis of Merkert and Swidan ([19]: 209), there are three different ways of jet fuel hedging and they can count as financial, natural and operational. Almost all airline companies utilize specific hedging techniques according to their financial and operational understandings to stabilize airline profits in fuel-swing times [20]. For Demydyuk (2011) Operating profit per passenger and per passenger-kilometre are key important variables to understand airline profitability.

According to the event study analyses of Drakos [21], crises and catastrophic events can be sources of structural breaks in airline management. For example, the September 11 terrorist attacks were caused by a big structural break and this structural break was sourced from not only systematic risks but also idiosyncratic risks, for Lee and Lang [22] profitability, growth and safety are negatively associated with systematic risk, while the debt leverage and firm size are positively related to systematic risk. The COVID-19 pandemic has had a profound financial impact on airline companies due to travel restrictions, flight cancellations, and reduced demand [23]. Airlines must prioritise financial sustainability to ensure their future operations. Airline companies have prioritised liquidity management to deal with revenue losses and operational difficulties caused by the COVID-19 outbreak [24]. Maintaining a strong cash position was crucial for emergency responses and operational flexibility. American airline companies sought government support to manage the crisis and safeguard their employees (Mudambi and Lu, 2020). Government support has been crucial in providing liquidity, financing salaries, and covering operational expenses. In response to the COVID-19 pandemic, airlines have implemented fleet optimization and cost control strategies to increase operating efficiency [25]. These strategies demonstrate businesses' efforts to protect their assets and use their resources effectively. Airline companies have developed effective communication strategies to maintain customer trust and ensure passenger safety during the COVID-19 era [26]. This is critical for preserving brand image and customer loyalty. The industry's ability to maintain financial sustainability, implement crisis management strategies, and receive government support has been crucial in navigating this challenging period. Especially in the crisis of 2007-2008, capital management overcame other financial bottlenecks. Airline management should focus on agreement quality with banks, leasing companies and aircraft manufacturers and they should understand the importance of profitability out of profits [27]. The statement of Dempsey [28] is so important to understanding the airline financial markets before and after regulation periods. According to his research results, there were airline bankruptcies before the deregulation process of 1978, and the US government solved

the bankruptcy problems through direct and indirect financial aids such as capital and liquidity injections to industry. The COVID-19 crisis has also deep impacts on the industrial structure. Almost all of the airline companies felt the crisis negatively. The list of restructuring, going bankrupt or shutting down airlines is given in Table 2.

Table 2. The Infected Airlines of Covid 19

North America	Africa	Europe	Australasia	Asia	Latin America
Compass Airlines	Comair	Alitalia	Virgin Australia	Thai Airways	Tame
Miami Air International	South African Airways	Flybe		Air Asia	Avianca
Ravnair Group	SA Express	German Airways			Latam
Express Jet	Air Mauritius	Germanwings			Aeromexico
Trans States Airlines					

Resource: [29].

Airlines are focusing on adapting to changes to maintain their financial sustainability and build a strong foundation for the future. In this process, the strategy of lease and sale of the aircraft fleets is also changed for airline companies. Their long-term planning and investment policies are also redefined ([30]: 52). These strategic changes aim to enhance the operational efficiency of airline companies and bolster their resilience against crises. The destructing impacts of the crisis are so large that the International Air Transportation Association (IATA) determined some specific measures such as the Provision of direct financial support to passenger and freight companies to compensate for the decline in revenue and liquidity; Provision of loans by governments or central banks, loan guarantees, and support for the corporate bond market; Provision of tax relief, and temporary exemption of ticket taxes and other taxes levied by governments for this period ([31]: 121).

3. Methodology and Data

As it is understood from the literature review section, civil aviation needs two important variables during the last quarter of the 20. century and the first ten years of 21.century financially. They are the efficient and effective asset utilisation and fluid revenue policy. On the other hand, we can observe them through the Tobin Q Ratio and The Dupont Analysis with their side impacts correctly.

The Dupont System is a financial analysis framework that breaks down Return on Equity (ROE) and Return on Investment (ROI) into key components, such as profitability, operational efficiency, and financial leverage [32](Ayustin et al., 2023: 55; Bunea et al, 2019; Bhagyalakshmi and Saraswathi, 2019). Therefore, it can be easily observed which variables have impacts on ROE. The formula of Dupont Analysis can be given as follows,

$$ROE = (Profitability) \times (Operational Efficiency) \times (Financial Leverage)$$

$$ROE = \frac{Net\ income}{Sales} \times \frac{Sales}{Total\ Assets} \times \frac{Total\ Assets}{Average\ Shareholder\ Equity} \quad \text{Formula 1.}$$

The Tobin Q ratio can be utilised for corporate value or firm performance [33, 34]. The following formula can be utilised for the Tobin Q ratio.

$$Tobin\ Q\ Ratio = \frac{Market\ value\ of\ firm\ efficiency}{Book\ value\ of\ firm\ efficiency} \quad \text{Formula 2.}$$

4. Data and Findings

The data is taken from yahoofinance.com for the years 2019 and 2022. The results of the Tobin Q and Dupont analysis ratio are given in Table 3 and Table 4 sequentially. The research sample, which was formed according to the market cap of US air carriers, represents %95 of the total market.

Table 3. Tobin Q Analysis Results

Airline	2022	2021	2020	2019
Alaska Airlines	0.547	0.605	0.596	0.571
American Airlines	1.264	1.391	1.092	0.803
Delta Airlines	0.651	0.760	0.788	0.514
Jet Blue Airways	0.411	0.435	0.517	0.547
Southwest Airlines	0.722	0.860	0.848	0.533
United Airlines	1.137	1.265	1.149	0.767

Table 4. Dupont Analysis Results

Airline	2022	2021	2020	2019
Alaska Airlines	0.016	0.075	-0.192	0.110
American Airlines	0.102	-0.036	-0.487	0.126
Delta Airlines	0.070	0.044	-0.401	0.137
Jet Blue Airways	-0.031	-0.004	-0.224	0.095
Southwest Airlines	0.091	0.125	-0.120	0.194
United Airlines	0.086	-0.035	-0.292	0.141

Tobin Q analysis is utilised for future investment opportunities of the companies (Tobin and Brainard (1968); Tobin (1969); Tobin and Brainard (1977); and Tobin (1978)) via the analyses of equity. According to the analysis results depicted in Figure 3. the impacts of the COVID-19 crisis hit the airline industrial structure between the years 2020 and 2021, and also the industry still suffers from the negativity, if it is focussed on the components of Dupont Analysis, the financial structure of the airline companies can be given as Figure 3 for all of the years in light of these arguments, it can easily be observed that the bottlenecks in the total revenues have affected financial structure of these airlines, even for the airline industry.

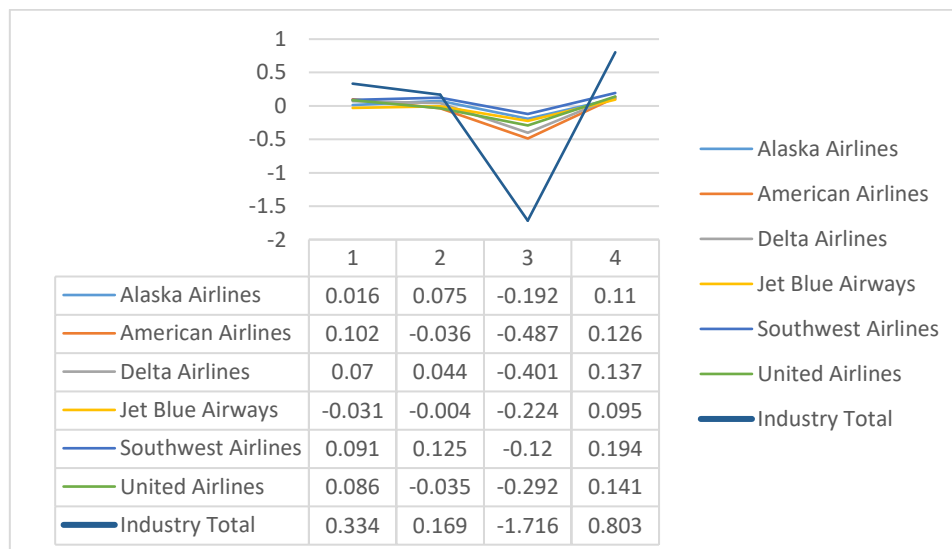


Figure 3. Dupont Analysis (ROE) Results

The findings indicate that the airline industry is facing financial challenges and requires strategic action to ensure financial sustainability and protect company values in Figure 4. The Tobin Q analysis offers insight into future

investment opportunities and the value of companies, but this study highlights the detrimental impact of the COVID-19 crisis on the airline industry.

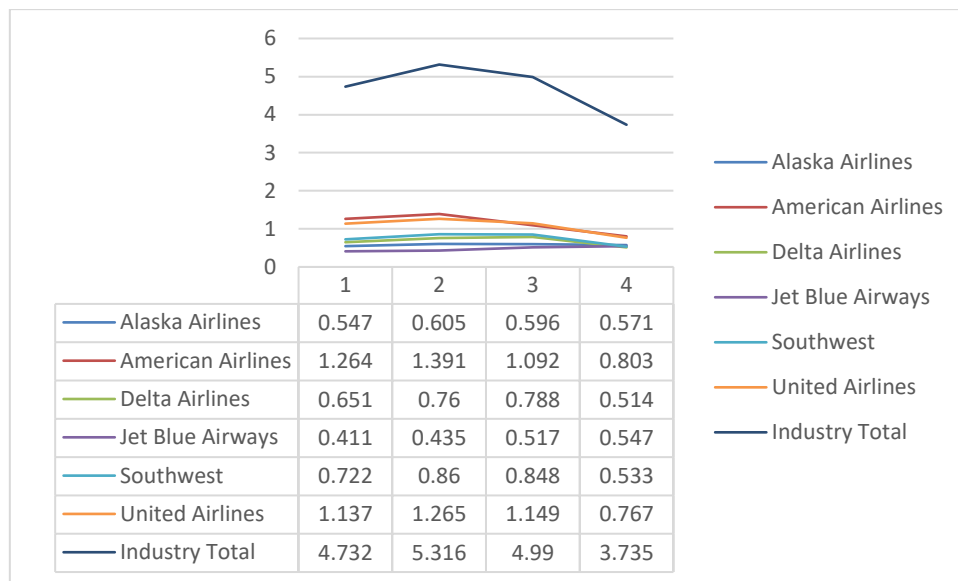


Figure 4. Tobin Q Analysis Results

5. Discussions and Conclusions

The hardship of the period also takes its place in literature parallel with this research findings. Some of the last research specifically concentrates on this matter, for example, The response of the air carriers to this crisis is stringent regarding flight cancellations and reduction in scheduling flights [35]. For these causes, it has occurred a loss of \$3300 per flight [36]. Pricing shifts and reticketing processes became an important subject for air carriers. Some crisis management policies of air carriers related to lower operating costs, consumer trust, product offering, corporate structure, workforce and work practices, as well as operational procedures began to come into force [37]. Financial disclosures also changed deeply [38]. Mergers and acquisitions are a promising business strategy for survival [39]. Naturally, the financial structure of the companies is diminished or redefined. At the end of the research, the following policy implications can be concluded for the United States airline companies,

- The airline industry must review its management strategies for financial sustainability and financial resilience and develop effective solutions in crisis times.
- It is important to maintain clear and objective language, avoid biased or emotional language and use precise subject-specific vocabulary when necessary. This is a process in which all stakeholders in the airline industry must collaborate.
- The financial structure of the American airline industry plays a crucial role in determining how companies manage important aspects such as financial sustainability, competitive advantages, and crisis resilience.
- Effective management of these elements can ensure the long-term success of companies and better prepare them to face uncertainties in the industry.
- If it is given a frank answer frankly the research question of this research, air carriers can develop coherent revenue flow through new ticketing policies which can be more flexible and operation costs should be managed without risking main asset and debt structures to escape DuPont pressures. To sustain balanced company value policies, corporate governance policies and practices (transparency, accountability, fairness) in financial

disclosures to the extent of state politics can gain importance not to catch Tobin Q's oppression. Hedging is always a good weapon, nevertheless, its existence is still a risky argument in crisis times.

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