Change in Air Cargo Revenue Before VS During the COVID-19 Pandemic

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Change in Air-Cargo Revenue Before Vs. During the COVID-19 Pandemic

Ali Abushal, Timothy Buchal, Ethan Noto, Dr. Brooke Wheeler, & Dr. Vivek Sharma

Abstract

This study examined the cargo airline revenue change from before to during the COVID-19 pandemic. Data were sourced from the Securities and Exchange Commission’s (SEC, 2017) and airlines websites. The results found a significant interaction between time period and airline on the revenue. Some airlines had increasing revenue, while one did not.

Background

The global impact of the COVID-19 Pandemic, which lasted from March 11, 2020, to May 5, 2023, was extensive. The aviation and air freight sectors faced unprecedented challenges due to lockdowns, travel restrictions, and economic uncertainties (WHO, 2020). While previous outbreaks, such as SARS and H1N1, had already affected the aviation industry, the scale of the COVID-19 crisis requires a closer examination. This study aims to analyze cargo airlines’ revenues before and during the pandemic specifically focusing on UPS, Amazon, FedEx and Atlas Air. The findings will provide valuable insights for industries to better prepare for future crises.

Purpose & Research Question

The purpose of this study was to determine the difference in cargo airline revenue before versus during the COVID-19 Pandemic. Was there a difference between the revenue of cargo airlines before and during the COVID-19 Pandemic?

Methods

We collected revenue from three cargo airlines operating in the United States: UPS, FedEx, and Atlas Air. The data primarily came from the official websites of these companies and the Quarterly Reports available on the website of the United States SEC (2017). To ensure accuracy, one author extracted the data, while another independently cross verified it as recorded correctly in the spreadsheet.

Microsoft Excel was used for descriptive statistics, such as means, medians, standard deviations, and ranges. RStudio was utilized for inferential statistics, specifically conducting a two-way ANOVA to examine how revenue differed before and during the pandemic and between airlines.

Results

- Pre-COVID average Quarterly Revenue was $11,688,253,205; during-COVID average Quarterly Revenue was $13,017,564,556.
- FedEx reported the highest revenue during the pandemic.
- Average quarterly revenue for Atlas Air increased by $243 million during the COVID-19 Pandemic.
- Average quarterly revenue for UPS decreased by $2.6 billion during the COVID-19 Pandemic.

<table>
<thead>
<tr>
<th>Descriptive statistics for Quarterly Cargo Airline Revenue</th>
<th>Mean</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Pre</td>
<td>11,688,253,205</td>
<td>16,313,000,000</td>
<td>476,394,000</td>
<td>20,568,000,000</td>
<td>7,982,635,428</td>
</tr>
<tr>
<td>Overall During</td>
<td>13,017,564,556</td>
<td>15,055,000,000</td>
<td>355,880,000</td>
<td>24,394,000,000</td>
<td>8,784,219,139</td>
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<tr>
<td>Atlas Pre</td>
<td>632,067,306</td>
<td>648,539,000</td>
<td>479,394,000</td>
<td>764,958,000</td>
<td>84,208,937</td>
</tr>
<tr>
<td>FedEx Pre</td>
<td>16,751,000,000</td>
<td>17,052,000,000</td>
<td>14,997,000,000</td>
<td>17,824,000,000</td>
<td>922,029,405</td>
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<tr>
<td>UPS Pre</td>
<td>17,687,692,306</td>
<td>17,456,000,000</td>
<td>15,015,000,000</td>
<td>20,568,000,000</td>
<td>1,526,945,426</td>
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<td>Atlas During</td>
<td>875,120,354</td>
<td>932,475,000</td>
<td>359,880,000</td>
<td>1,779,971,000</td>
<td>253,018,937</td>
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<td>FedEx During</td>
<td>21,921,166,007</td>
<td>22,367,000,000</td>
<td>17,308,000,000</td>
<td>24,394,000,000</td>
<td>1,453,487,851</td>
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<tr>
<td>UPS During</td>
<td>10,073,230,769</td>
<td>14,987,000,000</td>
<td>10,074,000,000</td>
<td>18,252,000,000</td>
<td>1,524,497,740</td>
</tr>
</tbody>
</table>

Discussion

Although the descriptive statistics indicate that two of the three cargo airlines had higher revenue during the COVID-19 Pandemic, the results did not entirely support the expectations. We reported the significant main effects of time period and airline; however, because of the statistically significant interaction, we cannot interpret any difference in revenue by time period or airline. The expectation was that there would be a difference in revenue, but the airlines experienced different financial outcomes.

This study's limitations lie in its focus on U.S.-based air cargo carriers, which restricts the generalizability of the findings to the US. Expanding the scope to international air cargo carriers can improve our comprehension of industry dynamics outside of the US.

Some of the air cargo industry displayed unexpected resilience, deviating from traditional expectations during the pandemic. One plausible explanation for the increasing revenue at two airlines is the decrease in in-person shopping and the increase in online shopping during the pandemic. Studying the strategies of airlines that have achieved success can be beneficial for airlines that may encounter challenging circumstances in the future. It provides insights and potential strategies for growth.

Future Research

Looking toward the future, continuously tracking revenue trends post-COVID-19 is vital to determine if the growth observed is a long-term pattern or a temporary response to an exceptional situation, and this would allow a comparison with the post-COVID time period. The revenue of cargo airlines outside the United States should be examined as well.

References
