# THE IMPACT OF THE COVID-19 PANDEMIC ON THE U.S. LUXURY HOTEL MARKET

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## ABSTRACT

This article attempts to distinguish the difference in luxury hotel-chains' stocks with the economy hotel-chains' stocks in the weeks after the SARS COVID-19 pandemic announcement on March 11, 2020. The five largest U.S., publicly traded hotel-chains: Choice, Hilton, Hyatt, Marriott, and Wyndham Hotels were examined. With an event-study, expected returns were calculated for the five firms and compared to the return of the S&P 500.The three luxury firms, Hilton, Hyatt, and Marriott, Average Cumulative Abnormal Returns (ACAR's) were tested against two economy hotel-chains, Choice and Wyndham, in a Wilcoxon rank-sum test. The study showed that the luxury hotel-chains proved to have negative ACAR's ten and 15-weeks after the announcement of the COVID-19 pandemic, indicating that the luxury hotel-chains were negatively impacted by the COVID-19 pandemic announcement. On the other hand, the economy hotel-chains did not see a significant ACAR after the announcement. The Wilcoxon-test concluded a difference between luxury hotel-chains' ACAR's and economy hotel-chains' ACAR's in the beginning stages of the pandemic. Thus, investments made in economy hotel-chains would have provided the investor with little to no losses when comparing it to luxury-focused hotels.

*Keywords:* U.S-Lodging Industry, Event-Study, COVID-19, Hotel Stock-prices

## INTRODUCTION

The magnitude of the COVID-19 SARS-virus became a reality for many world-leaders on March 11, 2020, when the World Health Organization (WHO) declared the COVID-19 virus as a global pandemic (World health Organization, 2020). On that same day, the U.S. closed its borders to Europe. Soon thereafter, the U.S. border was more or less closed to every non-US citizen (Mangan, 2020). At this time, President Trump declared on March 16 a national emergency, which was followed by quarantine measures (called stay-at-home order) and recommendations of working from home, no unnecessary travel, and avoidance of any type of social gatherings (Aljazeera, 2020). A month later, the Center for Disease Control (CDC) posted a two-week plan for the U.S. states to slowly open up (Centers for Disease Control and Prevention, 2020). The average U.S. states started to open up their economies in mid-May, where lodging and restaurants were given different opening measures across the country (Cable News Network, 2020). The two months of stay-at-home orders took a toll on the U.S. economy due to decreased spending and increased uncertainty.

During the second quarter of 2020, the U.S. experienced an annual decline of 32.9% in GDP (Horsley, 2020). Additionally, due to the stay-at-home orders that were in place in most states across the U.S., the unemployment ratio for the second quarter of 2020 was 13.6% compared to 3.6% in the previous quarter (Szmigiera, 2021). Thus, the U.S. government aided citizens with relief-money and other economic stimulus in order to get the economy back running after the devastating months of March and April (Horsley, 2020). Nevertheless, only 8% of low income and 9% of middle income used the money for non-essential purchases. The rest of the population used it to pay bills (66%, 49%), pay off debt (14%, 18%), and to save (12%, 24%) (Brown, Horowitz, & Minkin, 2021).

Many U.S. citizens were feeling an economic burden and uncertainty due to the COVID-19 pandemic; thus, increasing the negative impact of the pandemic announcement on the lodging-industry. According to a study conducted by Deloitte, consumers were unwilling to travel and stay at hotels in the U.S. during the first months of the pandemic (March, April, and May). Only 23% of the responders were comfortable traveling on a plane and 29% were comfortable staying at a hotel (Barua, 2021). According to Smith Travel Research (STR), the average U.S. Total Revenue per Available Room (TRevPAR) was $248.75 in 2019 and decreased by -62.9% to $93.02 in 2020. The largest decrease occurred in April and May 2020, which experienced a decrease of -92% respectively, consistent with consumers unwillingness to travel (Smith Travel Research, 2022a). The hotel business-travel revenue report showed large differences in hotel revenue stemming from business-travel by comparing 2019 with 2020. The U.S. total business-travel revenue declined in 2020, by 58% (American Hotel and Lodging Association, 2020b).

In order to examine the impact of the COVID-19 pandemic on the hotel-chains' market-share in the U.S. and globally, Tables one and two were prepared. They provide an overview of the market-share of each hotel-corporation in focus during the years of 2017-2020 (Bloomberg, 2022). Marriott had, throughout the years, held the largest share with Hilton having the second largest, and Hyatt the third largest; however, neither saw a large change in market-share throughout the years. Both Wyndham and Choice had a market-share of less than 6% throughout the years; though, Choice Hotels experienced the largest increase. Wyndham and Choice had relatively low shares, therefore, the percentage increase in market-share can be misleading (Bloomberg, 2022).

Table 1. Market-Share Amongst the Firms Examined

| Market share (Firms Examined) | 2017 | 2018 | 2019 | 2020 | % chg |
|---|---|---|---|---|---|
| Hilton | 21.51% | 22.78% | 23.28% | 21.67% | 0.74% |
| Hyatt | 11.81% | 11.39% | 12.36% | 10.39% | -12.02% |
| Marriott | 54.12% | 53.10% | 51.65% | 53.18% | -1.74% |
| Choice | 2.49% | 2.66% | 2.75% | 3.89% | 56.22% |
| Wyndham | 10.07% | 10.06% | 9.96% | 10.87% | 7.94% |

Source: (Bloomberg, 2022)

Table 2. Global Market-Share

| Market share (Global) | 2018 | 2019 | 2020 | % chg |
|---|---|---|---|---|
| Hilton | 13.96% | 14.49% | 13.71% | -1.8% |
| Hyatt | 6.98% | 7.70% | 6.58% | 5.7% |
| Marriott | 32.53% | 32.15% | 33.64% | 3.4% |
| Choice | (in other) | (in other) | 2.46% | - |
| Wyndham | 6.16% | 6.20% | 6.87% | 11.5% |

Source: (Bloomberg, 2022)

The negative impacts on the U.S. economy, and especially the lodging industry, is apparent due to the border closure, quarantine measures, and uncertainty amongst citizens. Therefore, this study attempts to measure the economic impacts on the lodging industry and its stock prices stemming from the COVID-19 pandemic. Thus, the research question: Did the WHO announcement of the Covid-19 pandemic, on March 11, 2020, have an impact on the U.S. hotel stock-returns? tries to answer the extent to which U.S. hotel-stocks were impacted. Moreover, in order to narrow the study down, an additional research question was asked: Was there a significant difference in stock-returns of luxury hotel-chains and economy hotels-chains when the COVID-19 pandemic was announced by the WHO? which examines the difference in business strategies and their corresponding impacts of its stock prices.

**Defining Luxury and Economy Hotel-Chains**

The Monthly Hotel Research Company: STR (2022b), defines the difference chain scales, of hotels around the world, based on the Average Daily Rate (ADR). Thus, the ADR is the quotient of the revenue per room divided by rooms sold, and merely includes revenue-generating hotel-rooms. Therefore, the ADR for luxury hotels should be higher due to additional amenities and services that economy-hotels often lack (Wijtenburg, 2020). A hotel brand with higher ADR is considered higher up on the scale, and lower ADR will be considered as an economy hotel or higher. Nevertheless, STR defines each hotel-chain brands' individually. Thus, in order to summarize each hotel-chains' operational portfolio, the brands were added together based on STR's scales, as depicted in Table three (Smith Travel Research, 2022b).

Table 3. The Hotel Chain's Brand Portfolio in % Based on ADR

| | Luxury Hotels | Upper Upscale | Upscale/Upper Midscale | Midscale | Economy |
|---|---|---|---|---|---|
| Hilton | 15.80% | 26.30% | 52.63% | 5.26% | - |
| Hyatt | 60.00% | 20.00% | 20.00% | 0.00% | - |
| Marriott | 24.10% | 34.50% | 41.38% | 0.00% | - |
| Choice | - | - | 55.56% | 22.22% | 22.22% |
| Wyndham | 4.20% | 12.50% | 33.33% | 29.17% | 20.83% |

Source: (Smith Travel Research, 2022c).

Table 4. Luxury-focused vs. Economy-focused Hotels in %

| | Upper Classification in % | Lower Classification in % |
|---|---|---|
| Hilton | 68.42% | 31.58% |
| Hyatt | 96.00% | 4.00% |
| Marriott | 86.19% | 13.79% |
| Choice | 16.67% | 83.33% |
| Wyndham | 29.20% | 70.83% |

Source: (Smith Travel Research, 2022c).

As seen in Table four, Hilton, Hyatt, and Marriott are heavily weighted towards Luxury, Upper-Upscale, and Upscale hotel-brands. On the other hand, Choice and Wyndham are heavily weighted towards the Upper-Midscale, Midscale, and Economy branded hotels, as defined by ADR (Smith Travel Research, 2022c). Thus, the research is based on STR's chain-scales, and its mathematical definition of luxury focused hotel-chains versus economy focused hotel-chains.

## PREVIOUS STUDIES ON PANDEMICS

The overall impact of the COVID-19 pandemic is still unknown; however, so far, we know that there has been a significant decrease in leisure and business travel since the WHO declared it a worldwide pandemic on March 11, 2020 (World Health Organization, 2020). Previous epidemics, such as the SVAR virus in 2003, drastically caused a decrease in leisure travel in parts of Asia. Chen, Jang, and Kim (2007) conducted an event study of Taiwanese hotel stocks during the SARS outbreak in Taiwan in 2003. The study concluded that there was a significant negative Cumulative Abnormal Return (CAR) starting on the day that the SARS virus was announced as a threat to the public. Furthermore, the hotel-industry saw the steepest negative return on the Taiwanese stock-market during the outbreak. Moreover, Gössling, Hall, and Scott (2020) analyzed the differences between previous crises and how the lodging industry experienced those in comparison to the COVID-19 pandemic. Other existential crises, such as 9/11 and the 2008 and 2009 recession, were not seen as negatively impactful on the hotel industry. Nevertheless, epidemics and pandemics are the most negatively impactful events on the hospitality industry and its stock returns. In addition, another study also showed that the COVID-19 pandemic has affected the stock market to a larger extent than any previous pandemics. With the usage of text-based methods in combination with stock-market movements from 1900 and market volatility from 1985 until today, they concluded that the reaction to the COVID-19 pandemic in 2020 was the largest market reaction in history. This massive market reaction was concluded to be mainly due to government interventions (Baker, Bloom, Davis, Kost, Sammon, & Viratyosin's, 2020).

Due to the COVID-19 pandemic being of similar nature to the Spanish Flu in 1918, governments around the world used similar measures to stop the spread of the COVID-19 virus. These actions included quarantine measures and travel restrictions, which were proven to have worked during the Spanish flu (Gössling et al., 2020) However, the measures put in place by the U.S. government did come with a price; thus, additional research on the impact of governmental measures on the hospitality industry was conducted. An event-study was based on U.S. hospitality stocks and the reaction of its stockholders to different governmental measures in forms of economic, health, and closures. The study found that the closure of the U.S. border as well as restrictions on state-to-state travel had the largest negative impact on hotel stocks. Additionally, fluctuation in U.S. hotel stocks were not only due to governmental interventions. The uncertainty in the nature of the coronavirus also played a big role in the ups and downs of the hotel industry stock-returns (Aharon, Cohen, Jacobi, Tzur, and Qadan, 2021). Thus, the lodging industry has been required to change their operations due to the COVID-19 pandemic, and its implied quarantine measurements, decrease in travel, and increase in hygiene requirements. According to Chi and Gursoy (2020), more research is required in the subject of post-COVID-19 tourism trends and individuals' willingness to go back to the pre-COVID-19 travel levels. This research was conducted in July of 2020 and thus indicated a low willingness for individuals to go back to their old travel habits.

The initial start of the COVID-19 pandemic led to one of history's biggest market crashes due to a large amount of uncertainty concerning the width of the pandemic, in combination with the U.S. government implementing measures to stop the spread of the virus. Dang, Mazur, and Vega (2021) analyzed different sectors in the U.S. stock-market in comparison to the S&P 500 benchmark on the days called Black Monday (9 March 2020), Black Thursday (12 March 2020), and Black Monday II (16 March 2020). During all of the days examined, there was a so-called "panic-selling". Consequently, investment decisions were based on emotions, and stock-valuations were no longer considered. The stocks that experienced the steepest drops were the hospitality sectors' shares, which also had extremely high volatility during the event-days and post-event weeks. Moreover, Clark, Mauck, and Pruitt (2021), conducted an event-study on global hospitality firms using three event-windows from the end of February to the end of March 2020. There were 154 global hospitality firms in the study at which they were compared to the S&P 500. The event-window with the largest Cumulative Abnormal Return proved to be March 13 to March 17, 2020. Additionally, research on the impact of the COVID-19 pandemic on hospitality stock returns in China was conducted by examining the effects of news. With a SVAR analysis, they analyzed the correlation between negative returns from January 13 to May 11, 2020. Therefore, concluding that negative stock-returns were mainly based on negative COVID-19 news and facts, such as increases in new confirmed cases. In contrast, positive unexpected news and facts had a small impact on the stock-prices of the hotels in China (Lee, Lee & Wu, 2021).

**Industry Analysis**

The U.S. hotel-industry experienced record-low Revenue per Available Room (RevPAR) and saw large decreases in Occupancy Rates (OCC) and ADR during 2020, as seen in Table five (Smith Travel Research, 2021d). This decrease was more severe than previous economic downturns, with RevPAR decreasing by 51.7%, 80%, and 71% respectively, in March, April and May of 2020. To put these numbers into context, RevPAR decreased by 20.5% YoY during the Great Recession (DuBois & Sanford, 2021). Thus, the aftermath of the worst months during the COVID-19 Pandemic is still lingering in the hotel-industry. The industry is not back to the pre-pandemic levels as seen in Table five, due to the lack of business travelers (CoStar, 2021; Smith Travel Research, 2020e). The hotel industry receives approximately half of their revenue from business travelers (Airoldi, 2022). Nevertheless, business traveling is expected to continue being down in 2022 by 23% from pre-pandemic levels (American Hotel and Lodging Association, 2022b).

Table 5. U.S., Hotel-Industry Key Metrics

| Key Metrics | 2021 | % chg | 2020 | % chg | 2019 | % chg |
|---|---|---|---|---|---|---|
| ADR | $125.0 | +21.1% | $103.2 | -21.3% | $131.2 | +1% |
| OCC | 57.6% | +30.0% | 44% | -33.0% | 66.1% | 0% |
| RevPAR | $72.0 | +58.3% | $45.5 | -47.5% | $86.8 | +0.9% |

Source: (Lock, 2022a; Smith Travel Research, 2021d; Smith Travel Research, 2020e)

According to DuBois and Sanford (2021), short-terms rentals and its associated companies, such as Airbnb and VRBO, also experienced a negative impact. However, the impact was worse for hotel-chains due to the sharp decline in business travelers. Short-term rentals quickly regained its pre-pandemic RevPAR values and reached $165.35 in June of 2020, much due to a steady ADR throughout the pandemic. On the other hand, hotels did not see the same recovery, and during the same month, experienced a RevPAR of $40.81, 64.8% lower than previous year (DuBois & Sanford, 2021). Because of this slow recovery of RevPAR by hotel-chains, the study merely focuses on hotels and the differences in hotel-chain scale segments.

In addition, there was a difference between the RevPAR of the considered luxury hotel-chains and the economy hotel-chains as depicted in Table six. The luxury hotel-chains experienced a sharper decline in RevPAR in 2020 compared to the economy hotel-chains. However, the table also shows how the RevPAR for the luxury-chains were significantly higher in 2019 than in 2021. In contrast, the economy-chains saw lower RevPAR in all three years examined; thus, the COVID-19 pandemic impact was less significant on their Revenue per Room.

Table 6. RevPAR Luxury hotel-chains vs. Economy hotel-chains

| RevPAR | 2021 | % chg | 2020 | % chg | 2019 |
|---|---|---|---|---|---|
| Hilton | $73.6 | +60.0% | $46.0 | -58.0% | $109.6 |
| Hyatt | $77.8 | +69.1% | $46.0 | -66.2% | $136.0 |
| Marriott | $74.7 | +57.1% | $47.5 | -64.6% | $134.6 |
| Choice | $48.2 | +47.4% | $32.7 | -30.6% | $47.2 |
| Wyndham | $35.9 | +46.5% | $24.5 | -40.1% | $40.9 |

Source: (Lock, 2022b; Lock, 2022c; Lock, 2022d; Hyatt Hotels Corp.- SEC Filings, n.d.; Choice Hotels International – SEC Filings, n.d.)

## DATA AND METHODS

Event-studies are widely used in finance to measure the impacts a specific event had on a stock-price and the value of a company. The first recorded event-study was conducted by James Dolley in 1933, at which the effects of stock splits were analyzed using an event window from 1921-1931 (Kothari & Warner, 2006). Since then, event-studies have been growing in usage as well as in complexity. “The usefulness of such a study comes from the fact that, given rationality in the marketplace, the effects of an event will be reflected immediately in security prices” (Campbell, Lo, MacKinlay, & Whitelaw, p.13, 1998).

In this report, an event-study was conducted on the five hotel-chains’ stock-prices during 31-weeks ranging from 11/25/2019 to 6/22/2020, emphasizing the weeks’ post-event window. The benchmark used in the study was S&P 500, at which the corresponding data values were collected during the same time-period. With the collected data, Abnormal Returns (AR) were calculated, which measures the difference between the actual return and the expected returns (Campbell et al., 1998; Kothari & Warner, 2006). Formulas and detailed methodology can be found in the appendix.

### Mann-Whitney Wilcoxon Test

To test the differences in stock-prices of the economy and the luxury hotel chains a Mann-Whitney Wilcoxon-test was used. The Wilcoxon-test is calculated by ranking the means of the AR from smallest to largest and summing them together to be tested against a random variable of the sample. Sample A was the luxury hotel-chains’ average stock-returns during the period examined, and sample B was the economy hotel returns. The returns for Samples A and B were ranked from smallest to largest separately; however, only one sample can be used in a Wilcoxon-test. Sample A was used in this study, i.e., the luxury hotel chains. The usage of sample B would have given the same or close to the same result according to Mann-Whitney Wilcoxon (1947). Moreover, in order for the Wilcoxon-test to work properly, the sample size must be larger than 10. Thus, the test statistic was given by the z-score at which the Null Hypothesis can be tested. With a 95% confidence interval the null hypothesis is accepted if $-1.96 \leq Z \leq 1.96$ (Mann & Whitney, 1947).

Figure 1

$$w = \sum_{i=1}^{n} A$$

Figure 2

$$\mu_A = \frac{n_A(n_A + n_B + 1)}{2} \quad \text{and} \quad \sigma_A = \sqrt{\frac{n_A n_B (n_A + n_B + 1)}{12}}.$$

More precisely,

$$\mathrm{pr}(W_A \geq w_A) \approx \mathrm{pr}(Z \geq z), \quad \text{where } z = \frac{w_A - \mu_A}{\sigma_A}$$

Source: (Mann Whitney, 1947).

## RESULTS AND ANALYSIS

### Average Abnormal Returns Across the Firms

The ACAR’s were calculated across the five firms during three post-event periods. The ACAR’s were compared to the benchmark of the S&P 500 returns during the same time period. Table seven indicates that the ACAR for the five weeks after the event-day was not significant. Demonstrating that the ACAR of -10.65% was not greater or lesser than the return of S&P 500 during the same time period with a 95% confidence interval. The ten weeks post-event date also showed a non-significant ACAR at which the five hotel stocks experienced returns of negative 4.78%. As concluded, the ACAR’s for both the five-weeks and ten-weeks, posterior the WHO’s COVID-19 announcement, was not significant. This finding could be due to the large amount of news on the possible future impacts of COVID-19 at which caused panic amongst investors in most industries (Mahata, Nurujjaman, Prakash, Prasad-Bal & Rai, 2021).

Presented in Table seven, a significant and large ACAR of -15.08% was recorded in the 15-week post-event window mainly due to investors being nervous about the future of the lodging industry

Table 7. The ACAR’s of All Hotels Examined.

| Time period | Average CAR | Sum Var | Var/N^2 | Square root | t-test | Significance 95% CI |
|---|---|---|---|---|---|---|
| (0,5) 3/9/2020- 4/13/2020 | -10.65% | 0.094 | 0.004 | 0.061 | -1.733 | No |
| (0,10) 3/9/2020-5/18/2020 | -4.78% | 0.058 | 0.002 | 0.048 | -0.990 | No |
| (0,15) 3/9/2020-6/22/2020 | -15.08% | 0.031 | 0.001 | 0.035 | -4.275 | Yes |

Source: (Choice Hotels International Inc, 2021; Hilton Worldwide Holdings Inc, 2021; Hyatt Hotel Corporation, 2021; Marriott International, 2021; Wyndham Hotels and Resort Inc, 2021; Yahoo! SPDR S&P 500 ETF, 2022).

(Florida Restaurant and Lodging Association, 2020). The immense difference between the three periods can be explained by the stabilization of the S&P 500, where the "panic sell-offs" on most holdings started to decline after the news about the pandemic had sunken in (Capelle-Blancard & Desroziers, 2020). However, the negative effects of the COVID-19 virus on the lodging industry were expected to be both large and lengthy. As Aharon et al's (2021) study concluded, the U.S. border-closure and travel restrictions were the most devastating governmental measures for the U.S. hotel industry. Thus, leading to both direct and indirect negative impacts, which is a potential reason for the immense decline of returns in the 15-weeks after the event-day. Moreover, as concluded by the SVAR-study made in China, negative COVID-19 related news had large negative impacts on the stock-returns of hotel firms' in China. Hence, similar negative impacts from COVID-19 related news in the U.S. could have impacted the U.S Hotels' stock returns in the 15-weeks post-event date (Chen et al., 2007).

Tables eight, nine, and ten depicts the total loss or positive return during the period examined based on the CAR. For the first five weeks after the event-day, Marriott and Wyndham experienced the largest negative CAR. However, due to Marriott's large number of shares, their company experienced a loss of $46,000 million, and Wyndham only $13,000 million. Nevertheless, in the ten-week post event-date, Wyndham saw positive CAR's, thus regaining most of the losses

Table 8. The Cumulative Abnormal Return Positive/Negative (0,5).

| **Hotel** | **CAR** | **Variance** | **# Shares** (in millions) | **Negative/Positive Return in $** (in millions) |
|---|---|---|---|---|
| Hilton | -10.54% | 0.008 | 52,920,000 | - 5,579 |
| Hyatt | -8.76% | 0.022 | 101,289 | - 8,873 |
| Marriott | -14.19% | 0.024 | 324,400,000 | - 46,018 |
| Choice | -5.80% | 0.016 | 55,536 | - 3,221 |
| Wyndham | -14.0% | 0.024 | 93,100 | - 13,009 |

Source: (Choice Hotels International Inc, 2021; Hilton Worldwide Holdings Inc, 2021; Hyatt Hotel Corporation, 2021; Marriott International, 2021; Wyndham Hotels and Resort Inc, 2021; Yahoo! SPDR S&P 500 ETF, 2022).

Table 9. The Cumulative Abnormal Return Positive/Negative (0,10).

| **Hotel** | **CAR** | **Variance** | **# Shares** (in millions) | **Negative/Positive Return in $** (in millions) |
|---|---|---|---|---|
| Hilton | -10.81% | 0.006 | 52,920 | - 5,723 |
| Hyatt | -17.34% | 0.013 | 101,289 | - 17,559 |
| Marriott | -8.67% | 0.014 | 324,400 | - 28,120 |
| Choice | -1.90% | 0.009 | 55,536 | - 1,057 |
| Wyndham | 14.81% | 0.017 | 93,100 | - 13,784 |

Source: (Choice Hotels International Inc, 2021; Hilton Worldwide Holdings Inc, 2021; Hyatt Hotel Corporation, 2021; Marriott International, 2021; Wyndham Hotels and Resort Inc, 2021; Yahoo! SPDR S&P 500 ETF, 2022).

Table 10. The Cumulative Abnormal Return Positive/Negative (0,15).

| Hotel | CAR | Variance | # Shares (in millions) | Negative/Positive Return in $ (in millions) |
|---|---|---|---|---|
| Hilton | -23.25% | 0.003 | 52,920 | - 12,303 |
| Hyatt | -27.34% | 0.008 | 101,289 | - 27,689 |
| Marriott | -19.44% | 0.010 | 324,400 | - 63,074 |
| Choice | -6.40% | 0.003 | 55,536 | - 3,553 |
| Wyndham | 1.01% | 0.006 | 93,100 | 944 |

Source: (Choice Hotels International Inc, 2021; Hilton Worldwide Holdings Inc, 2021; Hyatt Hotel Corporation, 2021; Marriott International, 2021; Wyndham Hotels and Resort Inc, 2021; Yahoo! SPDR S&P 500 ETF, 2022).

realized in the five-week period. Once again, in the 10-week period, Marriott experienced the largest loss in dollars. Though, Hyatt experienced the largest negative CAR. In the 15-week period, the CAR's of the three luxury focused hotel-chains saw large negative CAR's, all being in the 20's. Thus, Hilton, Hyatt, and Marriott experienced losses of $12,000, $28,000, and $63,000 million, respectively, in the 15-week period, as summarized in Table 10. On the other hand, the economy focused hotel-chains did not see as much of an aggressive decline. As a matter of fact, Wyndham saw positive CAR's and a positive return of $944 million, and Choice experienced a loss of $3,500 million.

**ACAR's of Luxury Hotels**

The average cumulative abnormal returns were calculated for the luxury firms (Hilton, Hyatt, and Marriott) and the economy firms (Choice and Wyndham) separately, to identify any anomalies between the two different strategies (economy versus luxury). Table 11 presents the ACAR's of

Table 11. The ACAR's of Luxury Hotels.

| Time period | Average CAR | Sum Var | Var/N^2 | Square root | T-test | Significance 95% CI |
|---|---|---|---|---|---|---|
| (0,5) 3/9/2020- 4/13/2020 | -11.16% | 0.054 | 0.0060 | 0.078 | -1.44 | No |
| (0,10) 3/9/2020-5/18/2020 | -12.27% | 0.033 | 0.0037 | 0.061 | -2.02 | Yes |
| (0,15) 3/9/2020-6/22/2020 | -23.34% | 0.022 | 0.0025 | 0.050 | -4.69 | Yes |

Source: (Choice Hotels International Inc, 2021; Hilton Worldwide Holdings Inc, 2021; Hyatt Hotel Corporation, 2021; Marriott International, 2021; Wyndham Hotels and Resort Inc, 2021; Yahoo! SPDR S&P 500 ETF, 2022).

the luxury hotels. The five-week post-event window was not significant, with a 95% confidence interval with ACAR's of -11.6%. Nevertheless, in the beginning of the pandemic, the U.S. had their borders closed, limiting leisure-travel to a minimum. Although travel within the U.S. was allowed, it was not recommended. Therefore, many luxury hotels were either obliged to shut down or to operate at a decreased capacity due to the immense costs it takes to run a luxury hotel. Moreover, the luxury hotels that stayed open were required to temporarily close down their amenities or to regulate the capacity. These facts could have been massively impacting the willingness to stay at a luxury hotel as well as the willingness to invest in a luxury-focused hotel-chain (Krishnan, Mann, Seitzman, & Wittkamp, 2020). Moreover, the ten- and 15-week post-event window both showed significantly different returns than that of the S&P 500, indicating that the luxury hotel-chains did see a notable negative impact due to the COVID-19 pandemic.

As depicted in Figures three, four, and five, the luxury focused hotel-chains experienced big peaks and troths of their individual CAR's. Nevertheless, the patterns of the three firms were of similar nature where the week of 3/30/2020 experienced a sharp decline in all three firms followed by a steep increase in the week of 4/6/2020.

Figure 3. CAR Marriott

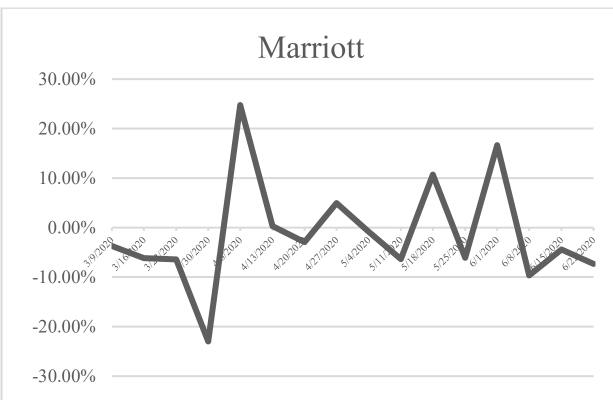



Figure 4. CAR Hilton

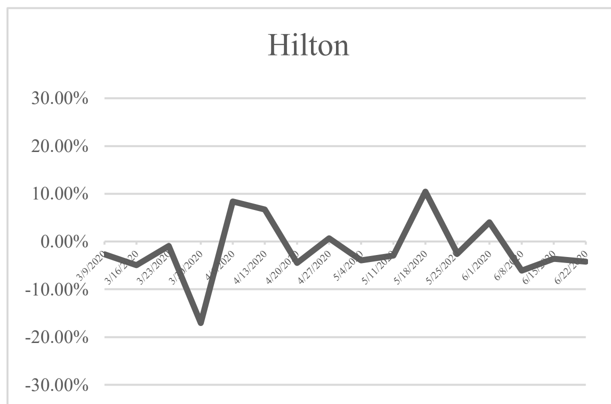
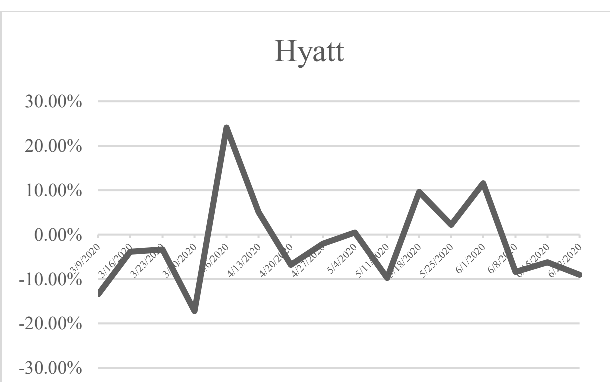



Figure 5. CAR Hyatt




Source: (Choice Hotels International Inc, 2021; Hilton Worldwide Holdings Inc, 2021; Hyatt Hotel Corporation, 2021; Marriott International, 2021; Wyndham Hotels and Resort Inc, 2021; Yahoo! SPDR S&P 500 ETF, 2022).

**ACAR’s of Economy Hotels**

The ACAR’s of the economy hotels were examined to see the effects of the COVID-19 pandemic on the economy hotel-chains, Choice and Wyndham, combined. Gössling et al. (2020) concluded, the COVID-19 pandemic caused the largest lodging industry market reaction in history, trumping both 9/11 and the 2008-2009 recession. However, the findings conclude that the economy hotel-chains experienced less of a negative impact compared to the luxury hotel-chains. The five, ten-, and 15-week period examined were not significant at a 95% confidence interval, indicating that the economy hotel-chains did not see any abnormal returns when comparing it to the S&P 500. As represented in Table 12, the ACAR’s of the five weeks post-event day was -9.89%, which was not greater or lesser than the S&P 500. The ten-week period experienced an ACAR of a positive 6.45%, and the 15-week period saw a small decline of -2.69%. The reason behind this small impact on U.S. economy hotel-chains could be many and therefore has to be further examined. Nevertheless, 52% of the American population are considered middle class, 29% are considered lower class, and with only 19% upper class (Kochhar, 2020). These statistical actualities in combination with tougher economic times could be a factor of the good performance of economy hotel-chains when comparing it to the luxury hotel-chains.

Table 12. The ACAR’s of Economy Hotels.

| Time period | Average CAR | Sum Var | Var/N^2 | square root | t-test | Significance 95% CI |
|---|---|---|---|---|---|---|
| (0,5) 3/9/2020- 4/13/2020 | -9.89% | 0.040 | 0.010 | 0.100 | -0.988 | No |
| (0,10) 3/9/2020-5/18/2020 | 6.45% | 0.025 | 0.006 | 0.079 | 0.814 | No |
| (0,15) 3/9/2020-6/22/2020 | -2.69% | 0.009 | 0.002 | 0.047 | -0.574 | No |

Source: (Choice Hotels International Inc, 2021; Hilton Worldwide Holdings Inc, 2021; Hyatt Hotel Corporation, 2021; Marriott International, 2021; Wyndham Hotels and Resort Inc, 2021; Yahoo! SPDR S&P 500 ETF, 2022).

The CAR of the two-economy hotel-chains’ in isolation of each other showed similar patterns as seen in Figures six and seven. Moreover, with the similarity in patterns there is an indication that

Figure 6. CAR Wyndham.

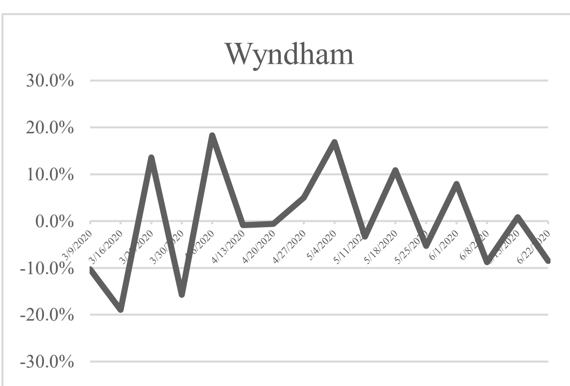



Figure 7. CAR Choice.

Source: (Choice Hotels International Inc, 2021; Hilton Worldwide Holdings Inc, 2021; Hyatt Hotel Corporation, 2021; Marriott International, 2021; Wyndham Hotels and Resort Inc, 2021; Yahoo! SPDR S&P 500 ETF, 2022).

the economy-focused business strategy performs different than the luxury. Moreover, Wyndham experienced positive CAR's to a greater extent than Choice; however, Choice Hotels experienced smaller movements in the CAR's during the time period examined.

**Wilcoxon-Test**

To test that the luxury strategy was different from the economy strategy in terms of ACAR's during the weeks after the event-date, a Wilcoxon-test was conducted. The differences in the means were tested for the 10-week and 15-week period. The 5-week period is not applicable to this test due to the precondition of having a sample size greater than ten.

As depicted in Table 13, there was a significant difference between the luxury hotel-chains' ACAR's and the economy hotel-chains' ACAR's during the ten-weeks post event-date. Moreover, as shown above, the ACAR's for the economy hotel-chains were positive in the ten-week period, whereas the luxury chains experienced negative ACAR's. A similar picture can be seen in Table 14, at which the luxury hotel-chains and the economy hotel-chains were significantly different in the 15-week post-event period. The economy hotel-chains experienced an ACAR of -2.69%, whereas the luxury hotel-chains experienced an ACAR of negative 23.34%.

The reason behind the significant difference in the luxury and economy hotel-chains can be many. However, the sharp decline (-32.9%) in GDP during the first quarter of 2020, much due to the soaring consumer spending, could be a factor (Horsley, 2020). Additionally, the U.S. were experiencing a high unemployment rate, which could be a reason for the decline in luxury hotel stays as well as luxury hotel stock-returns (Szmigiera, 2021). Moreover, there was a sharp decline in business travelers' post-event window (March 11, 2020). The total U.S. business travel revenue was expected to decline -66.2% YoY in 2021 which is a decline of 59 billion dollars (American Hotel and Lodging Association, 2020a).

Table 13. Wilcoxon-Test, 10-weeks

| Mean | Standard Deviation | Z-stat | Significance |
|---|---|---|---|
| 127 | 3.25 | -2.62 | Yes |

Table 14. Wilcoxon-Test, 15-weeks

| Mean | Standard Deviation | Z-stat | Significance |
|---|---|---|---|
| 264 | 4.69 | -2.77 | Yes |

Source: (Choice Hotels International Inc, 2021; Hilton Worldwide Holdings Inc, 2021; Hyatt Hotel Corporation, 2021; Marriott International, 2021; Wyndham Hotels and Resort Inc, 2021; Yahoo! SPDR S&P 500 ETF, 2022).

The decline of business travelers could be a reason for the negative ACAR for the luxury-focused hotel firms. However, this theory would have to be further examined. In addition, the economy hotels did see a slight increase in market-share post-event window. Indicating that the economy hotel-chains saw little to no impact on their market-share due to the COVID-19 pandemic. Moreover, the three luxury focused hotel chains, Hilton, Hyatt, and Marriott, did see a slight decline in their market-share over the period of 2017-2020. However, these changes were minimal and cannot be seen as a cause for the significantly negative ACAR's of the three luxury hotel-chains (Bloomberg, 2022).

## CONCLUSIONS

The COVID-19 pandemic impacted the lodging industry negatively. As expected, it caused both a decrease in customers as well as investors. Although the widespread virus affected all parties in the lodging industry, some hotel-chains performed better. This report examined the differences in business strategies, at which a luxury strategy and an economy strategy were compared. The ACAR's were firstly calculated on the five hotel chains during the five-, ten-, and 15-week interval. The ACAR of the 15-week interval saw significant abnormal returns, indicating that the five largest hotels in the U.S. experienced returns, on average, lower than the S&P 500 during the same timeframe. However, the economy hotel-chains were examined separately and did not experience a significantly ACAR in the five, ten and 15-week periods examined. Nevertheless, the luxury hotel-chains saw a significant ACAR in the ten- and 15-week post event-date. The reason for the difference could be many; however, the decrease in consumer spending in combination with high unemployment could have caused a shift away from staying in luxury hotels to instead a more budget friendly hotel. This hypothetical shift could also be the reason for a move in investors' sentiment, indicating a shift away from investing in hotels such as Hilton, Hyatt, and Marriott and instead invest in economy-focused chains such as Choice and Wyndham Hotels. Moreover, the luxury hotels were hit hard due to the substantial costs of running luxury hotels and the large amounts of staff needed. Thus, luxury hotels were running at limited capacity with limited amenities. In concluding remarks, The Wilcoxon-test showed with a 95% confidence interval that the hotels with an economy business strategy experienced significantly less ACAR's in the beginning of the pandemic in comparison to a luxury-focused strategy. The overall takeaway from this study is: in times of bad economic conditions, in times of uncertainty, and in times of highly contagious viruses, economy hotel-chains' stock-prices seem to see less of a negative impact than luxury-focused ones. This conclusion is backed up by the Wilcoxon-test which showed that there was a significant difference between the economy-focused hotel-chains and the luxury-focused hotel-chains in the beginning stages of the pandemic. This may be important to portfolio managers trying to mitigate risk associated with pandemics.

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## APPENDIX

### Detailed Description on Methodology

The data was collected from each of the Hotel's stock prices during the time period of 11/25/2019 to 6/22/2020, in addition adjusted closing prices from the S&P 500 was used. With the collected data, Abnormal Returns (AR) were calculated, which measures the difference between the actual return and the expected returns as illustrated by this formula (Campbell et al., 1998; Kothari & Warner, 2006):

Figure 8

$$AR_{i\tau} = R_{i\tau} - E(R_{i\tau}|X_{\tau})$$

Source: (Mann & Whitney, 1947).

To calculate the expected returns, the Capital Asset Pricing Model (CAPM) for the five different firms were calculated through a time-series regression at which the slope of the function is the Beta, i.e., the sensitivity to the hotel's stock prices in comparison to the S&P 500 (Lintner, 1965; Sharpe, 1964):

Figure 9

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

$$E(\varepsilon_{it} = 0) \qquad \mathrm{var}(\varepsilon_{it}) = \sigma^2_{\varepsilon_i}$$

Source: (Mann & Whitney, 1947).

The CAPM model concludes a linear relationship between the firm's stock-return and the market returns. The market model is based on the data from the period before the event, thus recording the return during "normal" times, at which Beta is the key driver in this model (Campbell et al., 1998, p.18).

Campbell (1998) highlighted the method of aggregating the abnormal return over time which is called Cumulative Abnormal Return (CAR) at which period T-t and T+t (B to time E) are analyzed.

Figure 10

$AR = \hat{\varepsilon}_{it}$ and for the (CARs), $CAR = \sum_{t=B}^{E} \hat{\varepsilon}_{it}$

Source: (Mann & Whitney, 1947).

### Average Cumulative Abnormal Return Across the Hotel Chains

The five hotel-chains were firstly studied together and later divided into luxury-focused and economy-focused hotel-chains, in order to examine the difference in strategies and their stock-returns during the start of the COVID-19 pandemic. The ACAR's were calculated for the five-, ten-, and 15-week period, as well as the corresponding variance, the t-statistics were tested in order to reject the Null Hypothesis.

Figure 11

$$ACAR = \frac{\sum_{i=1}^{n}\left(\sum_{t=B}^{E}\hat{\varepsilon}_{it}\right)}{n}$$

Figure 12

$$VAR(ACAR) = \frac{1}{n^2}\left[\sum_{i=1}^{n}\left(\sum_{t=B}^{E}\hat{\sigma}_{it}^{2}\right)\right]$$

Source: (Mann & Whitney, 1947).

Thus, the t-test was calculated by the ACAR of the period examined, divided by the square-root of the added variances of the time period (Campbell et al., 1998).

Figure 13

$$\frac{ACAR}{\sqrt{VAR(ACAR)}}$$

Source: (Mann & Whitney, 1947).

The t-statistic was used to test the significance of the ACAR's during the event-window that were being examined. The t-statistic should be greater than 1.96 or less than -1.96 in order to reject the Null hypothesis with a 95% confidence interval (Campbell et al., 1998).

H0: *The WHO announcement of the COVID-19 pandemic had no impact on the U.S., hotel stocks examined.*

Ha: *The WHO announcement of the COVID-19 pandemic had a significant impact on the U.S., hotel stocks examined.*

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