# Examining Patterns of Tourism Recovery in the United Arab Emirates: Towards the Implementation of Effective Marketing Strategies

Udjo Eseroghene[1] & Giovanna Bejjani[1]

[1] Business Division, Higher Colleges of Technology, United Arab Emirates

Correspondence: Udjo Eseroghene, Business Division, Higher Colleges of Technology, United Arab Emirates. E-mail: eudjo@hct.ac.ae

## Abstract

This study examines tourism recovery patterns in the United Arab Emirates (UAE). The study utilized time series modeling to evaluate the monthly tourism data from the Department of Culture and Tourism (DCT) in Abu Dhabi, covering 2019 to Q1 2023. The LJung box test was used to assess the fit of the dataset with the five tourism parameters: Average Length of Stay (ALOS), Number of Guests (NOG), Revenue Per Available Room (RevPAR), Occupancy Rate (OR), and Tourism Revenue (TR). The presence of nonstationarity was discovered, necessitating the use of data differencing to achieve stationarity.

The results indicate that the model fits the data for the five tourism parameters. The study also reveals a significant decline in UAE tourism visitors, with a modest recovery projected in Q4 2021.The findings demonstrate a substantial decline in hotel occupancy rates (OR) during the COVID-19 pandemic, with a slower recovery rate expected for 2023-2024. The average length of stay (ALOS) in hotels is four nights from Q4 2020 to Q1 2022 and is expected to remain the same in 2023-2024. Revenue per available room (REVPAR) is expected to decline in Q1 2023 and peak in Q3 2023. However, projections for 2023 and 2024 show continued growth in tourism revenue (TR) in the UAE.

**Keywords:** Number of guests, Occupancy rate, Revenue per available room, Average length of stay, Time series, Covid-19

## 1. Background and Context

The COVID-19 pandemic, which began in 2019 caused severe economic uncertainty and a significant decline in company activities globally. The tourism industry was the hardest hit of all industries (Jamal and Budke, 2020; Ma et al., 2020). According to Cheer et al., (2021), the entire worldwide travel supply chain was significantly impacted, causing a ripple effect that decimated community and individual livelihoods as well as national economies. The pandemic reduced worldwide tourist activity by 65% in the first half of 2020 (Behsudi, 2020), with significant social and economic effects. The decline in international travel effectively shut down the tourism and hospitality industry, resulting in fewer consumers, reduced tourism profits, and fewer service facilities. According to UNWTO (2021), the global tourism industry is still in decline, with international tourism growing by only 4% in 2021. This figure is significantly lower than pre-pandemic levels.

According to Richard and Beatrice (2021), the UAE's economy shrank by 6.1% in 2020 due to the combined effect of the COVID-19 pandemic and the decline in oil prices. As a consequence, the tourism industry's performance is projected to remain weak, with firms in this sector experiencing a continuous and significant drop in economic activity. It is unlikely that these firms will return to pre-pandemic levels in 2019 soon. The pandemic's far-reaching consequences on economies reliant on tourism, such as the UAE, necessitate an understanding of key parameters: Average Length of Stay (ALOS), Number of Guest (NOG), Revenue Per Available Room (RevPAR), Occupancy Rate (OR), and Tourism revenue (TR). Researchers and practitioners can acquire a thorough insight of the dynamics, strengths, and opportunities for development in the UAE tourism industry by analyzing these five (5) tourism parameters. Furthermore, regulators, industry stakeholders, and enterprises may use findings emanating from these data to establish successful policies, improve tourist experiences, and support long-term growth in the sector.

## 2. Tourism Trends, Patterns, and Parameters in the UAE

Understanding the trends and patterns of Average Length of Stay (ALOS), Number of Guests (NOG), Revenue Per Available Room (RevPAR), Occupancy Rate (OR), and Tourism Revenue (TR) in the tourism industry is critical for accurately extrapolating data, making informed predictions, and developing marketing effective strategies. Tourism is a complicated sector that is influenced by a variety of factors such as economic situations, world events, environmental concerns, and geopolitical challenges. Analysts can acquire a more thorough perspective of the industry's workings, comprehend the impact of numerous elements, and make informed predictions about future developments by identifying major trends and patterns. Academics and industry participants must be up to date on the latest trends and patterns to comprehend the sector's growth and sustainability (Smith & Johnson, 2019).

Trend analysis and extrapolation is critical for the tourism industry since it provides important insights into consumer behavior and market trends. Tourism stakeholders can make informed judgments, predict future trends, and build suitable risk-mitigation measures by examining patterns and extrapolating data. One significant advantage of understanding trend analysis and extrapolation is the capacity to forecast future market patterns. According to a World Tourism Organization assessment, global international tourist arrivals are predicted to exceed 1.8 billion by 2030 (UNWTO, 2021). This estimate serves as a foundation for tourism stakeholders to plan their investments and prepare for the influx of tourists. By examining prior patterns and extrapolating data, tourism organizations may forecast future demand, find emerging markets, and make educated product creation and market positioning decisions. In this sense, by monitoring tourist industry trends, tourism firms may identify altering customer preferences and adapt to them. Recent statistics, for example, show that 53% of global tourists favor eco-friendly destinations (Booking.com, 2021).   These insights assist tourism organizations in tailoring their products and services to their consumers' needs, hence enhancing customer loyalty. Trend analysis and extrapolation are also required for destination management organizations (DMOs). This is because, through trend research, DMOS can identify growth areas and invest in infrastructure, marketing, and product development. Furthermore, trend research may help DMOs identify emerging cultural tourism destinations and create unique experiences that attract tourists.

### 2.1 Number of Guests (NOG)

The number of guests staying in a hotel is an important indicator for the tourism industry. This parameter has a significant impact on the hotel's overall revenue and operational efficiency (Gosh, 2020). A review of extant literature on this issue indicates that several factors influence hotel guest numbers. One of the key factors is its location. Kim and Ko (2012) found that centrally located hotels with convenient access to tourist attractions, shopping malls, and transportation tend to attract more tourists than hotels in remote areas. Additionally, hotels that are situated in popular tourist destinations or near business districts are more likely to experience higher occupancy rates.

Another important factor that affects guest numbers is hotel room rates. According to Li et al., (2021), hotels that offer competitive prices tend to attract more customers. Furthermore, the availability of different price alternatives, such as discounts for longer stays or special packages, might impact customers' decision-making process. Low-cost hotels can attract budget-minded guests, but this can be viewed as inferior in quality. Luxury hotels, on the other hand, with higher room prices, may appeal to customers looking for a more premium experience or specialized facilities. It is essential for hotels to strike a balance between offering affordable prices and maintaining quality standards to attract a diverse range of guests.

While location and price are often cited as important factors, hotel security is just as crucial. According to Lee and Hwang (2021), hotels that prioritize security measures such as surveillance cameras, locked doors, and fire protection systems may attract more customers. Guests emphasize their safety and look for hotels that offer a safe atmosphere. These extra precautions are designed to provide our guests with peace of mind and safety. Moreover, hotels that actively communicate their security measures and demonstrate a commitment to guest safety through certifications or partnerships with security agencies can enhance their reputation and attract more guests.

### 2.2 Occupancy Rate (OR)

The COVID-19 epidemic resulted in a dramatic drop in tourism occupancy rates worldwide. According to Gursoy and Chi (2021), global hotel occupancy fell by 72% in April 2020 when compared to the same month the previous year. Similarly, Jaiswal and Singh (2021) discovered that the average hotel occupancy rate in India dropped from 62% in January 2020 to 24% in April 2020. The pandemic's emergence resulted in widespread travel restrictions, lockdowns, and anxiety among travelers, severely affecting the tourism industry. Travel

restrictions and quarantine measures, according to Hosseini et al., (2021), have resulted in a considerable decrease in tourist arrivals in Iran. International and domestic travel restrictions implemented to prevent the spread of the virus had a significant impact on the flow of visitors, since individuals were unable or unwilling to travel. To mitigate the impact of the pandemic on hotel occupancy rates, hotels in various countries implemented strategies to attract guests. Cai et al., (2021) observed that hotels in China that provided discounts and promotions had greater occupancy rates than those that did not. Hotels that offered special discounts, bundles, and flexible cancellation policies were able to attract guests who were frugal with their money and looking for the most value for money. Furthermore, Dube et al., (2021) opined that hotels that implemented health and safety measures, such as the usage of personal protective equipment and frequent sanitation of public places, had higher occupancy rates than those that did not. During the epidemic, guests prioritized their health and safety, and hotels that displayed a commitment to preserving cleanliness and taking preventive measures earned travelers trust.

*2.3 Average Length of Stay (ALOS)*

The average length of stay (ALOS) is the number of nights a guest stays in a vacation rental home. Most vacation rental outlets anticipate an ALOS of 5.6 nights. The COVID-19 epidemic resulted in a considerable decrease in the average length of stay of tourists globally. Kim and Agrusa (2021) stressed that the average length of stay of tourists in Hawaii fell from 8.7 days in 2019 to 6.4 days in 2020. These data demonstrate the pandemic's disastrous impact on the average length of stay in the tourism industry.

Global travel restrictions implemented by various governments, fear, and anxiety also have a significant impact on the average length of stay. As a result of the virus's uncertainty and anxieties, tourists were more inclined to cut their visits short and return home earlier than intended. According to Chan and Chen (2021), travel limitations have resulted in a significant decrease in the average duration of stay of tourists in Taiwan. Similarly, Meng et al., (2023) affirm that travel limitations in China reduced the average length of stay of tourists. Travel schedules were interrupted by restrictions on foreign and domestic travel, resulting in shorter stays as passengers had to change their plans and cut their vacations short. Furthermore, the fear and anxiety surrounding the pandemic also played a role in reducing the average length of stay. Travelers may have felt compelled to return home sooner to guarantee their safety, or they may have been apprehensive about possible travel restrictions or lockdowns. These psychological factors influenced the decision-making process of tourists, resulting in shorter stays.

As the tourism industry recovers from the pandemic, the average length of stay is expected to gradually increase. As passengers' trust in travel returns, they felt more at ease staying for extended periods of time and visiting different places. However, the recovery process will depend on various factors, including the effectiveness of vaccination campaigns, easing of travel restrictions, and the overall economic situation.

*2.4 Revenue Per Available Room (RevPAR)*

RevPAR (Revenue per Available Room) is a crucial performance metric used to assess a hotel's financial success. The COVID-19 outbreak resulted in a massive decline in hotel RevPAR around the world. For instance, hotel RevPAR in Spain fell by 78.4% in 2020 compared to the previous year (UNWTO, 2020). Similarly, Kim and Agrusa (2021) confirm that the RevPAR of hotels in Hawaii fell by 65.9% in 2020 when compared to the pre-COVID-19 era. The distribution of COVID-19 vaccinations, on the other hand, increased tourist confidence, resulting in an increase in RevPAR (UNWTO, 2020). Morar et al., (2021) expanded on this issue by adding that as vaccination campaigns progressed and the number of vaccinated people increased, travelers felt more secure and comfortable resuming their trip plans. It cannot be overstated that the availability of vaccinations had a critical role in raising tourist's confidence and reducing anxieties about contracting the virus while staying in hotels. RevPAR is expected to recover more if vaccine efforts continue and travel restrictions ease. The rate of recovery, however, may vary by location, depending on factors such as vaccination rates, government laws, and tourist confidence. To attract and keep customers in the post-pandemic age, hotels will need to change their strategies by focusing on providing excellent guest experiences, establishing health and safety standards, and offering appealing promotions.

*2.5 Tourism Revenue (TR)*

Tourism revenue is the financial income generated from various tourism-related activities within a specific destination or region. It includes tourist spending on accommodations, transportation, food, attractions, shopping, and other travel-related services and products. Tourism revenue declined by 80% in the first half of 2020 compared to 2019 (Gretzel et al., 2020; Gössling et al., 2020; Kim et al., 2020). The unprecedented disruptions caused by the pandemic led to widespread travel restrictions, lockdowns, and reduced travel demand. According to Gursoy et al., (2021), the pandemic drastically affected hotel earnings in Turkey. In general, hotels lost a

significant amount of money because of travel restrictions and decreased travel demand, which resulted in lower occupancy rates and fewer reservations.

The closure of borders, cancellation of flights, and strict quarantine measures implemented by governments created an atmosphere of uncertainty and fear among travelers, leading to a significant decrease in travel demand. The decrease in travel demand resulted in poor revenue performance for tourism-related products and services (Sigala, 2020). The pandemic had an impact on tourism revenue in a variety of areas, including lodging, transportation, attractions, and restaurants. Customers were refused entry at restaurants and cafés as a result of limits on indoor dining and decreased foot traffic in key tourist regions. Attractions and entertainment locations suffered as well, since social distancing measures and crowd limits curtailed their capacity and operations.

As the UAE Tourism industry begins to recover, it is critical to restore tourist confidence, establish strong health and safety measures, and change marketing techniques to accommodate changing visitor tastes.

## 3. Theoretical Framework

### 3.1 Risk Society

The COVID-19 pandemic exhibits the characteristics of a risk society. Diseases in a risk society are uncontrollable and cross boundaries due to the world's interconnectedness (Meadows et al., 2019; Pietrocola et al., 2021). Beck (1992), coined the term "risk society". According to Beck, modern society is preoccupied with risk management and risk minimization. The risk society framework serves as the foundation for investigating tourism recovery patterns in the UAE tourism industry. In today's high-risk society threats emerge as unintended "side effects" of scientific, technological, and economic progress (Mythen, 2018).

Hall (2020) examined the concept of risk in the context of COVID-19 and discovered that tourism business is always concerned with risk management, but the pandemic brought new challenges and uncertainties. Similarly, Gössling et al., (2021) investigated the pandemic's impact on several areas of the tourism industry, including transportation, housing, and attractions. The risk society paradigm, according to these authors, supports in comprehending the various ways in which risks are managed and communicated in the tourism business. Another study that supports the use of risk theory in tourism is that of Koens et al., (2018), who investigate "overtourism". Koens et al., (2020) emphasized implicitly that the risk society model can assist academics and practitioners in understanding the dangers connected with countries and cities experiencing an influx of tourists that exceeds their carrying capacity.

## 4. Methods

The study employed a quantitative research methodology that focused on time series analysis to investigate patterns in the monthly Dubai tourism data spanning from 2019 to the first quarter of 2023. To assess how well the model fits the five tourism parameters, the Ljung-Box test was utilized as a diagnostic tool. The Ljung-Box test helps evaluate whether the residuals of the model exhibit any significant autocorrelation, which is important in ensuring the model's accuracy and reliability. The initial stage in the investigation was to determine the tourism data's stationarity. Stationarity refers to the statistical property of a time series where its mean, variance, and autocovariance remain constant over time. By analyzing the sequence chart, it was determined that the tourism data set was nonstationary, meaning it did not meet the criteria of stationarity. This violated the underlying statistical premise required for modeling time series data. To address this issue, the differencing approach was employed. Differencing involves taking the difference between consecutive observations to make the time series data stationary. This transformation helps in stabilizing the mean and removing any trends or seasonality present in the data.

In the second step of the analysis, the expert modeler method was utilized to find the best-fitting model for the data. The expert modeler method involves exploring various models and selecting the one that provides the best fit based on statistical criteria and expert judgment. A model fit table includes indices such as stationary R-squared, Root Mean Square Deviation (RMSE), and Mean Absolute Percentage Error (MAPE) to evaluate and analyze model performance.

## 5. Results and Findings

### 5.1 Actual Number of Guests Versus Predicted Number of Guests To The UAE

Hotel guests are legitimate hotel room occupants whose name and address are registered with the hotel. The first tourism parameter examined is the actual number of guests and the predicted number of guests in the UAE. Figure 1 and table 1a,b and c depict this.
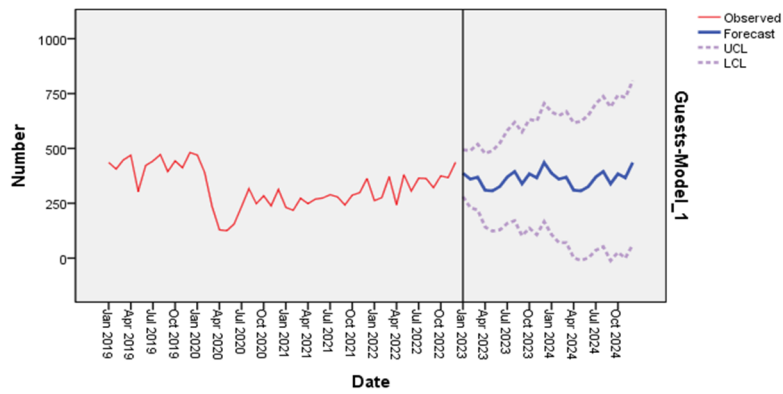
Figure 1. Actual number of guests versus estimated number of guests

According to Figure 1, the number of guests to the UAE decreased steadily from the first quarter of 2020 to the second quarter of 2021. However, guest numbers to the UAE tourism industry began to rise again in the fourth quarter of 2021. A forecast for 2023-2024 was made to see if this trend would continue. The findings indicate that the growth trend will continue, but at a slightly slower rate than the pre-pandemic average of around 500,000 visitors per month. The expert modeler method was used to assess the plausibility of the findings. Using predictive analytics, the simple seasonal model was chosen as the appropriate predictive model. The fit statistics are shown in tables 1a, b, and c.

Table 1a. Model Description for number of guests

|  |  |  | Model Type |
|---|---|---|---|
| Model ID | Number of Guests | Model_1 | Simple Seasonal |

Table 1b. Model Fit for number of guests

| Fit Statistic | Mean | SE | Minimum | Maximum | Percentile | | |
|---|---|---|---|---|---|---|---|
|  |  |  |  |  | 5 | 10 | 25 |
| Stationary R-squared | .548 | . | .548 | .548 | .548 | .548 | .548 |
| R-squared | .679 | . | .679 | .679 | .679 | .679 | .679 |
| RMSE | 52.944 | . | 52.944 | 52.944 | 52.944 | 52.944 | 52.944 |
| MAPE | 12.496 | . | 12.496 | 12.496 | 12.496 | 12.496 | 12.496 |
| MaxAPE | 77.690 | . | 77.690 | 77.690 | 77.690 | 77.690 | 77.690 |
| MAE | 34.563 | . | 34.563 | 34.563 | 34.563 | 34.563 | 34.563 |
| MaxAE | 176.582 | . | 176.582 | 176.582 | 176.582 | 176.582 | 176.582 |
| Normalized BIC | 8.100 | . | 8.100 | 8.100 | 8.100 | 8.100 | 8.100 |

Table1c. Model Statistics for number of guests

| Model | Ljung-Box Q(18) | Number of Outliers |
|---|---|---|
|  | Sig. |  |
| Number of Guests-Model_1 | .847 | 0 |

A thorough examination of fit statistics such as the stationary R-squared, Root Mean Square Error (RMSE), and Mean Absolute Percentage Error (MAPE) was performed to assess the fittingness of the simple seasonal model for predicting future trends in the UAE tourism industry. According to Ljung (1978), a well-fitted model should have a positive stationary R-squared value and a P-value > 0.05 (Chen et al., 2001; Pearn et al., 2014). The RMSE and MAPE values should preferably be less than 5% and 10%, respectively (Brockwell and Davis, 2002). Despite having RMSE and MAPE values of 52.94 and 12.49, respectively, which fall outside the ideal range, the fit indices in tables 1b and 1c show a stationary R2 value of 0.548 (p = 0.847, p > 0.05), showing that it is a well-fitted model. This is consistent with Ljung (1978) criteria for testing the lack of fit of a time series model.

*5.2 Occupancy Rate*

Occupancy rate is an index that compares the number of occupied rooms in a hotel to the total number of available rooms. This index is an important tourism indicator that depicts the consumption pattern of hotel rooms in the UAE. This parameter was examined to determine how hotels in the UAE tourism industry use resources before and after the pandemic. Figure 2 and tables 2a, b, and c demonstrate the findings of this analysis.
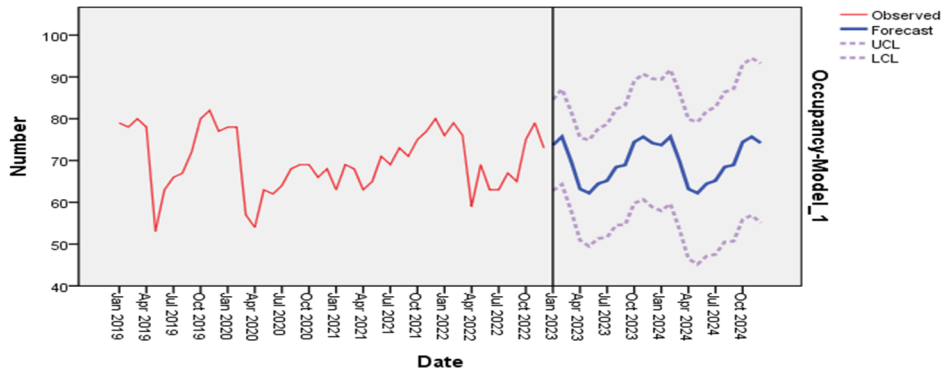


Figure 2. Actual occupancy rate versus estimated occupancy rate

Prior to the pandemic, hotel room occupancy was at 80% on average, according to Figure 2. However, from Q1 2020 to Q4 2021, the occupancy rate fell dramatically. Occupancy rates began to rise in Q1 2022. However, the forecast for the period 2023-2024 suggests that the increase will fluctuate downward in the second quarters of both years before sharply rising in the fourth quarters of both years.

The expert modeler approach was utilized to assess the accuracy of this findings. The ARIMA (1, 0, 0) model was found to be the best fitting model, with fit statistics reported in tables 2a, b, and c. The RMSE of 6.2 in the table is slightly above the acceptable level, but the MAPE of 6.55 is within acceptable limits.

Table 2a. Model Description for occupancy rate

|  |  |  | Model Type |
|---|---|---|---|
| Model ID | Occupancy rate | Model_1 | ARIMA(1,0,0) |

Table 2b. Model Fit for occupancy rate

| Fit Statistic | Mean | SE | Minimum | Maximum | Percentile | | |
|---|---|---|---|---|---|---|---|
|  |  |  |  |  | 5 | 10 | 25 |
| Stationary R-squared | .294 | . | .294 | .294 | .294 | .294 | .294 |
| R-squared | .294 | . | .294 | .294 | .294 | .294 | .294 |
| RMSE | 6.237 | . | 6.237 | 6.237 | 6.237 | 6.237 | 6.237 |
| MAPE | 6.554 | . | 6.554 | 6.554 | 6.554 | 6.554 | 6.554 |
| MaxAPE | 40.587 | . | 40.587 | 40.587 | 40.587 | 40.587 | 40.587 |
| MAE | 4.340 | . | 4.340 | 4.340 | 4.340 | 4.340 | 4.340 |
| MaxAE | 21.511 | . | 21.511 | 21.511 | 21.511 | 21.511 | 21.511 |
| Normalized BIC | 3.822 | . | 3.822 | 3.822 | 3.822 | 3.822 | 3.822 |

Table 2c. Model Statistics for occupancy rate

| Model | Ljung-Box Q(18) | Number of Outliers |
|---|---|---|
|  | Sig. |  |
| Occupancy rate-Model_1 | .532 | 0 |

The ARIMA (1, 0, 0) model indices in tables 2b and 2c had a stationary R-squared of 0.294 (p= 0.532, p>0.05), indicating a good fit. This is consistent with Ljung's (1978) criterion for testing the lack of fit of a time series

model.

*5.3 Average Length of Stay (ALOS)*

The average length of stay (ALOS), which represents the average number of nights a hotel guest spends in a hotel, is used in tourism planning. The analysis of this parameter is presented in figure 3.
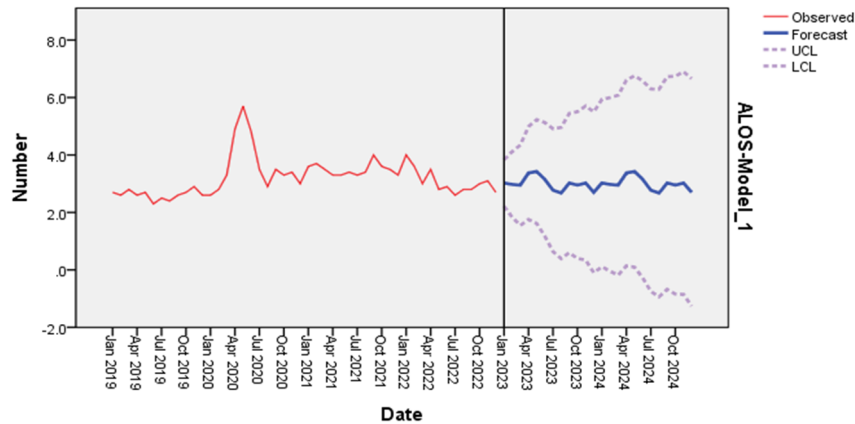


Figure 3. Actual average length of stay versus estimated average length of stay

There was a noticeable trend in the average length of stay in hotels during the pre- and post-pandemic periods. Figure 3 shows that the average length of stay ranged from 3 to 5 nights between the first and third quarters of 2019. From the fourth quarter of 2020 to the first quarter of 2022, the average length of stay was 4 nights. A trend projection to 2023-2024 indicated that the average length of stay would be 4 nights.

The expert modeler approach was used to evaluate the precision of the study findings. Through the utilization of fit statistics, the ARIMA (1, 0, 0) model was determined to be the most optimal fitting model, with the corresponding fit indices reported in tables 3a, b, and c. The Root Mean Square Error (RMSE) of 0.451 and the Mean Absolute Percentage Error (MAPE) of 8.84 in table 3a are within the acceptable threshold.

Table 3a. Model Fit for average length of stay

|  |  |  | Model Type |
| --- | --- | --- | --- |
| Model ID | Average length of stay | Model_1 | ARIMA(1,0,0) |

Table 3b. Model Fit average length of stay

| Fit Statistic | Mean | SE | Minimum | Maximum | Percentile | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | 5 | 10 | 25 |
| Stationary R-squared | .567 | . | .567 | .567 | .567 | .567 | .567 |
| R-squared | .546 | . | .546 | .546 | .546 | .546 | .546 |
| RMSE | .451 | . | .451 | .451 | .451 | .451 | .451 |
| MAPE | 8.842 | . | 8.842 | 8.842 | 8.842 | 8.842 | 8.842 |
| MaxAPE | 33.217 | . | 33.217 | 33.217 | 33.217 | 33.217 | 33.217 |
| MAE | .299 | . | .299 | .299 | .299 | .299 | .299 |
| MaxAE | 1.628 | . | 1.628 | 1.628 | 1.628 | 1.628 | 1.628 |
| Normalized BIC | -1.430 | . | -1.430 | -1.430 | -1.430 | -1.430 | -1.430 |

Table 3c. Model Fit Statistics for average length of stay

| Model | Ljung-Box Q (18) | Number of Outliers |
| --- | --- | --- |
|  | Sig. |  |
| Average length of stay-Model_1 | .900 | 0 |

A closer look at the ARIMA (1, 0, 0) model indices in tables 3b and 3c revealed a stationary R-squared of

0.567(P= 0.900, p> 0.05). These indices show that the ARIMA (1, 0, 0) model fits the data well.

### 5.4 Revenue Per Available Room (REVPAR)

In the tourism industry, revenue per available room is a popular performance metric. It is an important determinant of a hotel's financial success. This parameter computes the revenue generated per available room, including not only room revenue but also revenue from additional sources such as food and beverage, spa, and other amenities. Figure 4 depicts the total revenue per available room.
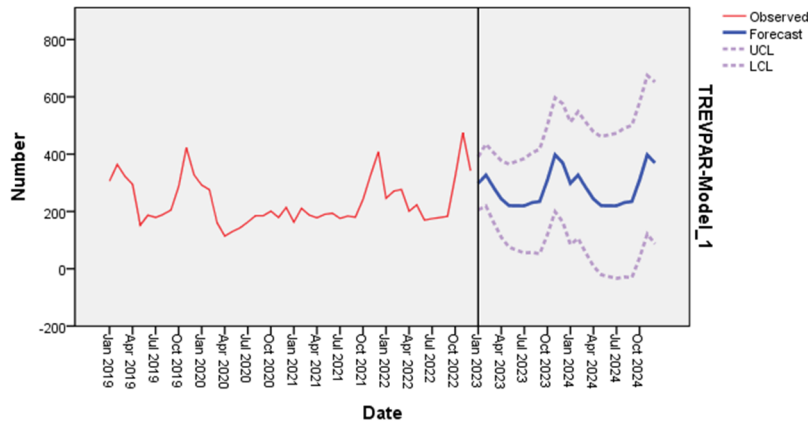


Figure 4. Actual revenue per available room versus estimated revenue per available room

According to figure 4, actual revenue per available room peaked in the first and fourth quarters of 2019 and the first quarter of 2022. A trend projection from 2023 to 2024 shows a decline in the first quarter of 2023, with a peak expected in the third quarter of 2023. The second and third quarters of 2024 show another dramatic decline in REVPAR, with a gradual increase in the fourth quarter of 2024.

The expert modeler approach was used to examine the accuracy of the findings. The fit statistics revealed that the ARIMA (1, 0, 0) (0, 1, 0) model was the best fitting model, as proven by the fit indices shown in tables 4a, b, and c. Although the RMSE and MAPE in table 4a were higher than acceptable, the stationary R squared of 0.514(P=0.089, p> 0.05), demonstrating that the ARIMA (1,0,0) (0, 1, 0) model fit the data well.

Table 4a. Model Fit for total revenue per available room

| | | | Model Type |
|---|---|---|---|
| Model ID | Total revenue per available room | Model_1 | ARIMA (1,0,0) (0,1,0) |

Table 4b. Model Fit for total revenue per available room

| Fit Statistic | Mean | SE | Minimum | Maximum | Percentile | | |
|---|---|---|---|---|---|---|---|
| | | | | | 5 | 10 | 25 |
| Stationary R-squared | .514 | . | .514 | .514 | .514 | .514 | .514 |
| R-squared | .269 | . | .269 | .269 | .269 | .269 | .269 |
| RMSE | 66.156 | . | 66.156 | 66.156 | 66.156 | 66.156 | 66.156 |
| MAPE | 22.222 | . | 22.222 | 22.222 | 22.222 | 22.222 | 22.222 |
| MaxAPE | 90.540 | . | 90.540 | 90.540 | 90.540 | 90.540 | 90.540 |
| MAE | 47.439 | . | 47.439 | 47.439 | 47.439 | 47.439 | 47.439 |
| MaxAE | 205.840 | . | 205.840 | 205.840 | 205.840 | 205.840 | 205.840 |
| Normalized BIC | 8.484 | . | 8.484 | 8.484 | 8.484 | 8.484 | 8.484 |

Table 4c. Model Fit Statistics for total revenue per available room

| Model | Ljung-Box Q (18) Sig. | Number of Outliers |
|---|---|---|
| Total revenue peravailable room-Model_1 | .089 | 0 |

### 5.5 Tourism Revenue (TR)

Tourism revenue is an important indicator since it provides a complete picture of its financial success. Figure 5 illustrates hotel revenue over time.
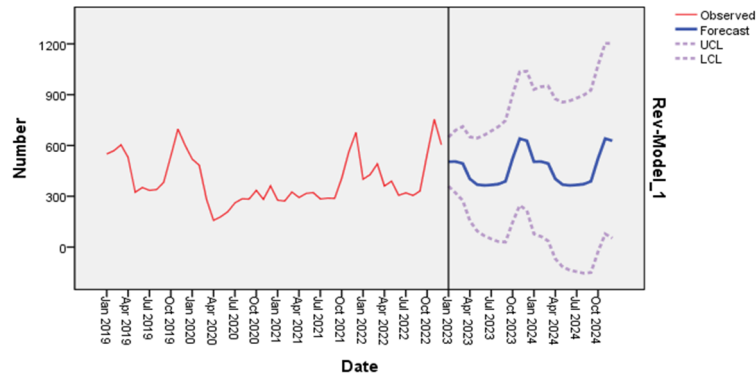


Figure 5. Actual revenue versus estimated revenue

Figure 5 shows that the highest revenue peaks were in the fourth quarters of 2019, the first quarter of 2022, and the fourth quarter of 2022. The revenue in the other time series was lower. Data projections for 2023 and 2024 show that the growth trajectory for hotel revenue in the UAE will continue. However, growth will slow in the second quarters of 2023 and 2024.

The expert modeler method was used to assess the findings' plausibility. The simple model was chosen as the best forecasting model. The model's fit was evaluated by carefully reviewing the fit statistics, which included stationary R-squared, Root Mean Square Error (RMSE), and Mean Absolute Percentage Error (MAPE). Even though the RMSE value of 100.20 and MAPE value of 18.49 as shown in table 5b exceeding the optimum range, the fit index displayed in table 5c has ($P= 0.372$, $p>0.05$), suggesting a well-fitted model. This discovery is consistent with Ljung's (1978) criterion for determining the lack of fit of a time series model.

Table 5a. Model Fit for revenue

| | | | Model Type |
|---|---|---|---|
| Model ID | Revenue | Model_1 | Simple |

Table 5b. Model Fit for revenue

| Fit Statistic | Mean | SE | Minimum | Maximum | Percentile | | |
|---|---|---|---|---|---|---|---|
| | | | | | 5 | 10 | 25 |
| Stationary R-squared | .000 | . | .000 | .000 | .000 | .000 | .000 |
| R-squared | .502 | . | .502 | .502 | .502 | .502 | .502 |
| RMSE | 100.209 | . | 100.209 | 100.209 | 100.209 | 100.209 | 100.209 |
| MAPE | 18.498 | . | 18.498 | 18.498 | 18.498 | 18.498 | 18.498 |
| MaxAPE | 80.381 | . | 80.381 | 80.381 | 80.381 | 80.381 | 80.381 |
| MAE | 72.021 | . | 72.021 | 72.021 | 72.021 | 72.021 | 72.021 |
| MaxAE | 274.999 | . | 274.999 | 274.999 | 274.999 | 274.999 | 274.999 |
| Normalized BIC | 9.295 | . | 9.295 | 9.295 | 9.295 | 9.295 | 9.295 |

Table 5c. Model Fit Statistics for revenue

| Model Fit statistics | | | | Ljung-Box Q(18) |
|---|---|---|---|---|
| Stationary R-squared | R-squared | Statistics | DF | Sig. |
| .000 | .502 | 18.274 | 17 | .372 |

## 6. Marketing Implications

The United Arab Emirates (UAE) is seeing a boom in tourism growth in the post-pandemic era, giving an ideal opportunity for businesses in the tourism industry to alter their marketing strategy. Smart marketing improvements are required to tap into the growing consumer base, deliver unique experiences, and effectively promote the UAE as a choice destination. Businesses in the UAE must be aggressive in their marketing activities in response to the growing number of tourists. One way of achieving these strategic fronts is to personalize services for guests depending on their interests and preferences.

Several studies have demonstrated that this approach can improve tourists' entire experience, resulting in increased customer satisfaction and loyalty (Xu et al., 2017; WTO, 2017; Riegger et al., 2021). Furthermore, industry participants can use digital marketing platforms to reach a larger audience with the distinctive characteristics and experiences provided by the UAE tourism industry.

Hotels in the UAE tourism industry can use strategic marketing campaigns to maximize their resources and improve the tourists experience during seasons of high occupancy. Rather than relying exclusively on price concessions, hotels can differentiate themselves in the competitive market by emphasizing value-added services and distinctive offerings. Hotels can cooperate with local attractions, tour operators, or event organizers to develop bundled packages that mix lodgings and experiences to appeal to a broader spectrum of tourists. This strategy appeals to tourists looking for ease and a smooth travel experience, improving the hotel's attractiveness.

Efficient marketing strategies should also be used to increase guests' average duration of stay. This can be accomplished by offering appealing package deals and discounts for longer stays, as well as delivering great customer service to ensure a pleasant experience for guests. Offering a variety of activities and experiences that cater to the interests of guests will also help keep them occupied for a longer period, resulting in higher revenue and profitability, as well as improved reputation and customer loyalty.

Hotels in the UAE should upsell additional facilities such as food and drinks, spa treatments, and other experiences to improve revenue per available room (REVPAR) and overall revenue. They should also use revenue management software to adjust room price based on market demand and supply dynamics, seasonality, events, and rival pricing.

Finally, developing efficient marketing strategies is critical for expanding the number of visitors to the UAE tourism business in a sustainable way. Personalizing services, leveraging digital marketing channels, optimizing resources during low occupancy periods, offering enticing package deals and discounts, providing exceptional customer service, offering a variety of activities and experiences, and optimizing room pricing are all strategies that can be used to achieve this goal.

## 7. Conclusion

The study examined how the tourism organizations in the United Arab Emirates (UAE) recovered after the COVID-19 epidemic. The study utilized time series modeling to evaluate the monthly tourism data from the Department of Culture and Tourism (DCT) in Abu Dhabi from 2019 through Q1 2023. The LJung box test was used as a diagnostic tool to determine how well the dataset fit the five (5) tourism parameters. Nonstationarity was detected during the time series analysis, so the data was differenced to achieve stationarity. The findings of this study indicate that the tourism industry in the UAE experienced a significant decline in occupancy rates during the COVID-19 pandemic. The average hotel stay was four nights in the fourth quarter of 2020-2022, and this trend is likely to continue in 2023-2024.The average length of stay in hotels was 4 nights from the fourth quarter of 2020 to the first quarter of 2022, and it is projected to remain the same in 2023-2024. This finding highlights the need for hotels and tourism organizations in the UAE to focus on attracting longer-staying tourists to increase revenue. The total revenue per available room saw a decline in the first quarter of 2023, with a peak expected in the third quarter of 2023. However, data projections for 2023 and 2024 show that the growth trajectory for hotel revenue in the UAE will continue. This finding is encouraging and suggests that the tourism industry in the UAE is resilient and may recover faster than anticipated.

## 8. Directions for Future Research

The study contributes novel insights that are useful for global tourism executives and marketers making future decisions.

Despite the study's achievements, some limitations should be noted. First, the study was limited to monthly data from the DCT in Abu Dhabi. As a result, the findings may not apply to other countries or locations.

To remedy this gap, future studies should broaden the dataset beyond the monthly statistics provided by the DCT in Abu Dhabi.

Furthermore, future studies should compare the recovery patterns of the UAE tourism industry to other countries or regions to overcome the generalizability gap. This is so because, through a comparative analysis, we can uncover both similarities and differences in the recovery patterns of the tourism industry, enabling us to identify elements that influence recovery in different contexts.

### Authors contributions

The success of this research article hinged on the distinctive contributions of the authors. Giovanna played a pivotal role in shaping the study's design and effecting crucial changes. In contrast, Dr. Udjo made substantial contributions spanning various facets of the research—methodology, literature evaluation, data compilation, analysis, and result interpretation. The synergy between the two authors significantly elevated the study's comprehensiveness, yielding a meticulous and well-rounded research endeavor.

### Competing interests

The authors state that no acknowledged conflicting financial interests or personal ties influenced the work discussed in this paper.

### Informed consent

Obtained.

### Ethics approval

The Publication Ethics Committee of the Canadian Center of Science and Education.

The journal and publisher adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

### Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

### Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

### Data sharing statement

No additional data are available.

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