



Prediction of Hilton's Future Cashflows

Junze Dai^{1,*}, Xiao Han^{2,†}

¹Glasgow School, University of Electronic Science and Technology of China, 611730, Chengdu, China

²Business School, University of Sydney, 2052, Sydney, UNSW, Australia

[†]These authors contributed equally.

*Corresponding author. Email: xhan0721@uni.sydney.edu.au

ABSTRACT

As the world was hit by COVID-19 in the last few years, the global hotel industry has also been greatly affected. As one of the biggest hotel groups in the world, Hilton faced tremendous cash flow pressure in 2020 and 2021. To forecast Hilton's cash flow performance over the next few years, we apply the linear regression method to analyze and forecast the asset and liability situation of Hilton in this paper. Based on the linear regression model, we select several key factors, which could be the major factor in the movement of assets and liability. By analyzing the historical data of the key factors and assets and liability, we obtain the regression equations as well as the forecasted results. Furthermore, several extreme cases with a small probability of occurrence will affect the financial performance of Hilton enormously, and some suggestions for Hilton's development are discussed qualitatively.

Keywords: Hilton, hospitality, COVID-19, pandemic, linear regression

1. INTRODUCTION

The breakout of COVID-19 has led to a substantial recession in economic activity and intensified global economic malaise at a rapid speed [1]. The spread of COVID-19 and large-scale travel restrictions continue to wreak havoc on the global tourism and hospitality industry [2]. The hospitality industry is one of those vulnerable and seriously impacted sectors by the coronavirus pandemic, including financial loss, decrease in customers, and disruption in industrial chains [3]. Prior to the pandemic, this sector was flourishing globally. However, The hotel industry is vulnerable to threats posed by unexpected catastrophes such as epidemics, natural disasters, and terrorist attacks. Coronavirus has sharply reduced the customers' willingness to feast or stay in a hotel due to social distancing policies and the risk of contracting the deadly virus [4]. Although the government in each country provides emergency funding to the hotels, not all business is able to adapt to the changes, such as social distancing, and suffer potential risks of failure, some of which even closed down during the COVID-19 [5].

The pandemic has tremendously reshaped the hospitality industry, which will last for a long time, it is important for Hilton to develop various ways to survive the post-pandemic era and recover from destruction [6].

Strategic management is attached to substantial importance in the hospitality sector to deal with the adverse effects of COVID-19 [7]. Hotels need to adapt to the changes in customers' hotel selection preferences and develop adaptive measures to provide safe and relaxing services to attract customers [8]. Following the unanticipated COVID-19 epidemic, hoteliers must address shifts in customer demand and regain passengers' faith. Recent studies have made various proposals for hospitality to adapt to the post-crisis era. Hotels could utilize artificial intelligence (AI) and robotics, hygiene and cleanliness, and health care to be more resilient and achieve effective post-disaster recovery [9]. Given the importance of social distance as a COVID-19 preventive approach, hotels that implement AI and robots, particularly in high-contact settings, can assist to safeguard customers and frontline service staff. Furthermore, considering the devastating consequences of the pandemic and hotel guests' heightened safety-related expectations while travel, hygiene, and cleanliness must be key areas when anticipating the hotel industry's recovery post-COVID-19. Consumers are willing to pay additional for these health safety measures [10]. Due to the lingering anxiety connected with this pandemic and comparable diseases, health will be a crucial influencing element in the tourist and hospitality industry's recovery following the COVID-19 epidemic. In the case of an emergency, while traveling, hotel-based

healthcare services can comfort guests. Awards for staff could improve employers' motivation and retain elite professionals [11].

In this paper, we use a linear regression model for the asset and liability forecasting of Hilton for 2021 to 2025. We select several key factors for the asset side and liability side respectively, which are regarded as independent variables in the process of regression analysis. By substituting the data of these key factors and the balance sheet for the last 5 years into the model, we obtain the weights, namely, the coefficients of these variables, as well as the interceptions, thereby obtaining the final regression equations for both asset and liability. In analyzing the efficiency and accuracy of our model, four significant indicators are considered principally, the R square, adjusted R square, P value, and the residual. In detail, the results show that both of the R square, and adjusted R square reach relatively high values, ensuring the independent variables could explain most of the various independent variables. Furthermore, under the precondition of setting the confidence level at 95%, the P values are always less 0.05, which means that the regression coefficients are significant. In addition, no regularity and tendency in residual sequence show that the independent variables could reflect the changing trend of explained variables perfectly. And then, by analyzing Hilton's strategic layout for the next few years, as well as some reports from analytical companies, we forecasted the value of key factors for the next five years reasonably. Therefore, substituting them into the regression equation, we obtain the forecasted results of asset and liability for the next five years.

Finally, we draw the conclusion that its balance sheet of Hilton in the next five years will be relatively healthy. Since the asset side will demonstrate a steady upward trend, at the same time, the liability side will rise in volatility. However, the asset side can always override the liability side.

The remainder of the paper is organized as follows: Section 2 introduces the basic background of Hilton, as well as the situation of its share price in recent years; section 3 describes the analytical model and situation of the hotel industry; section 4 discusses the development proposal of Hilton; section 5 presents our conclusion.

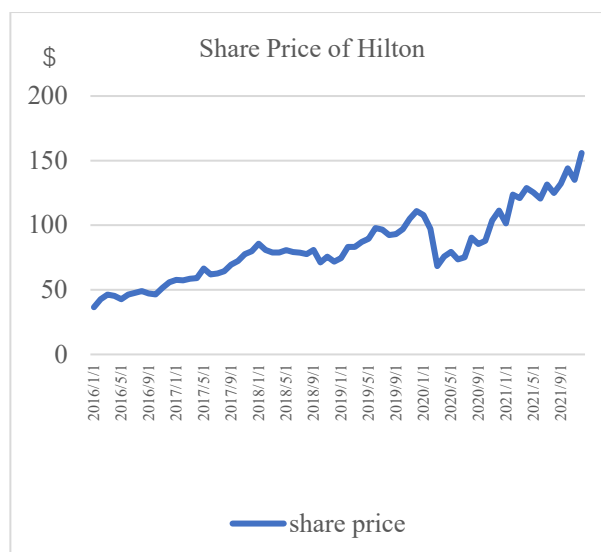


Figure 1 Share Price of Hilton

2.BACKGROUND OF HILTON

Hilton Worldwide Holdings Inc. is a major worldwide hospitality corporation with a portfolio of 18 world-class brands, 6,800 locations, and over one million rooms throughout 122 countries and territories. Hilton has welcomed more than 3 billion guests in its more than 100-year existence, earning a top rank on the 2021 World's Best Workplaces list and being recognized as a worldwide leader on the Dow Jones Sustainability Indices for five consecutive years. Its fee-based, capital-efficient, and highly resilient business model has great global expansion potential, resulting in opportunities for its team members and superior returns for hotel owners and stockholders.

In 1925, Conrad Hilton opened the first hotel to bear the Hilton name 1925. Hilton is the first NYSE-listed corporation to join the domestic gaming market in the 1970s. From 2016 to 2020, Hilton's financial condition is overall healthy, except for being negatively influenced in 2020 due to COVID-19. In 2021, Hilton continued its expansion and investment. Hilton deployed various industry-leading technological advancements to improve the guest experience, in addition to launching more than one hotel each day on average.

We analyzed the relationship between the revenue and inventory of Quanjude restaurant, as one of the most famous restaurants in China, which is shown as figure.

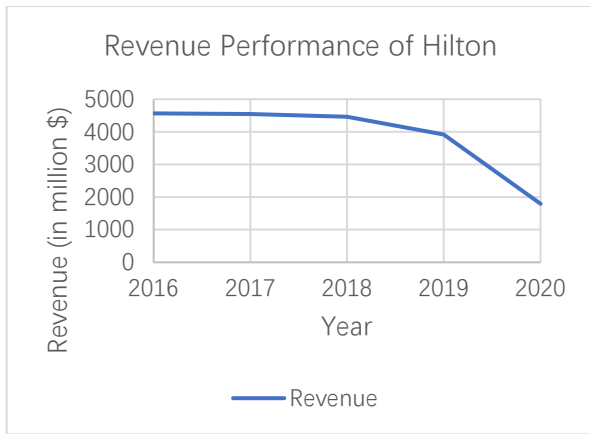


Figure 2 Revenue Performance of Hilton



Figure 3 Inventory situation of Hilton

In 2019, Hilton's share price was slowly but steadily increasing from about \$70 to \$100. However, from February to April of 2020, the share price sharply decreased to \$55. Since April 2020, the share price has been increasing overall, except remained steady from

March 2021 to August 2021. In March 2022, the share price of Hilton is around \$150 per share.

3.METHOD

3.1 Empirical Model

To forecast the cash flow of Hilton in the next 5 years, we applied a linear regression model.

In linear regression, we regarded several key factors, which could affect and reflect the asset and liability

situation of Hilton, as variables, namely “X”, and thus, the asset and liability were “Y”.

By investigating and analyzing, we determined two factors for the asset, which are "total rooms" and "inventory" (represented by revenue of restaurant), and "interest" and "total rooms" for liability. On the asset side, since "total rooms" correspond to the number of hotels Hilton has around the world, which are the most important assets for a hotel company. And we use the revenue of the restaurant in the Hilton hotel to represent its inventory. For the hotel nowadays, the restaurant inventory accounts for a large portion of the total inventory. And there is a strong positive correlation between restaurant inventory and the hotel restaurant’s revenue. For the liability side, the interest rate can reflect Hilton's level of borrowing, and total rooms correspond to the most of the account payable and lease liability, which are two very important components of Hilton's liability structure.

To verify whether there is a perfect linear relationship between these factors and assets and liability, at the same time, to obtain the extent of factors' influence on assets and liability, we conducted a regression analysis using the data from 2016 to 2020.

Table 1. the historical data of total rooms, the revenue of restaurant, and interest from 2016 to 2020

| | Total rooms | Revenue of restaurant(million) | Interest |
|------|-------------|--------------------------------|----------|
| 2016 | 796440 | 395.75 | 12.00% |
| 2017 | 856115 | 496.19 | 12.20% |
| 2018 | 912960 | 659.66 | 12.28% |
| 2019 | 971780 | 670.5 | 12.49% |
| 2020 | 1019287 | 331.674 | 12.61% |

Table 2. regression analysis results for asset

| | Total rooms | Revenue of restaurant | Intercept |
|-------------|-------------|-----------------------|-----------|
| Coefficient | 0.004628 | 0.200399 | -1690.73 |

| | | | |
|-----------|----------|----------|----------|
| P value | 0.00549 | 0.020857 | 0.034599 |
| Lower 95% | 0.003147 | -0.05998 | -3080.10 |
| Upper 95% | 0.00611 | 0.021451 | -301.274 |

Table 3. regression analysis results for liability

| | Interest | Total rooms | Intercept |
|-------------|-------------|-------------|--------------|
| Coefficient | 203366.6864 | 0.000074599 | -22955.24013 |
| P value | 0.031057 | 0.028172 | 0.028215 |
| Lower 95% | 45460.23 | -0.003226 | -39906.4 |
| Upper 95% | 361273.1 | 0.003226 | -6004.07 |

Table 4. residual output of asset-side regression analysis

| | Predicted Y | Residual | Std. Residual |
|---|-------------|----------|---------------|
| 1 | 2134.985 | 45.0149 | 1.0443 |
| 2 | 2446.571 | -62.5709 | -1.45158 |
| 3 | 2767.261 | -14.2612 | -0.33084 |
| 4 | 3043.327 | 35.67318 | 0.827582 |
| 5 | 3143.856 | -3.85604 | -0.08946 |

Table 5. residual output of liability-side regression analysis

| | Predicted Y | Residual | Std. Residual |
|---|-------------|----------|---------------|
| 1 | 1996.255678 | 16.74432 | 0.439581 |
| 2 | 1919.360681 | -53.3607 | -1.40085 |
| 3 | 2086.294594 | 50.70541 | 1.331147 |
| 4 | 2517.752531 | -8.75235 | -0.22978 |
| 5 | 2765.336515 | -5.33652 | -0.1401 |

The results (Table 1-Table 5) shown above illustrated that the R square and adjusted R square are both large enough for asset and liability, which means almost all changes independent variables can be explained by key factors. Furthermore, the significance F, namely, the P-value, is always less than 0.05 (since we set the confidence level as 95%). In addition, there is no regularity or tendency in residual terms. Thus, we suggest that the regression equation can reflect the changing trend of the explained variables perfectly.

The regression equation are shown below:

$$\text{Asset: } y = 0.004628X_1 + 0.352263X_2 - 1690.73$$

$$\text{Liability: } y = 203366.7X_1 + 0.0000746X_2 - 22955.2$$

Furthermore, we found some interviews of Hilton's executives and future data of the variables forecasted by some analytical firms, we forecasted the value of all of the variables reasonably. And thus, by applying the regression equation we obtained before, we got the forecast value of assets and liability for 2021 to 2025

(Figure 2 and Figure 3).

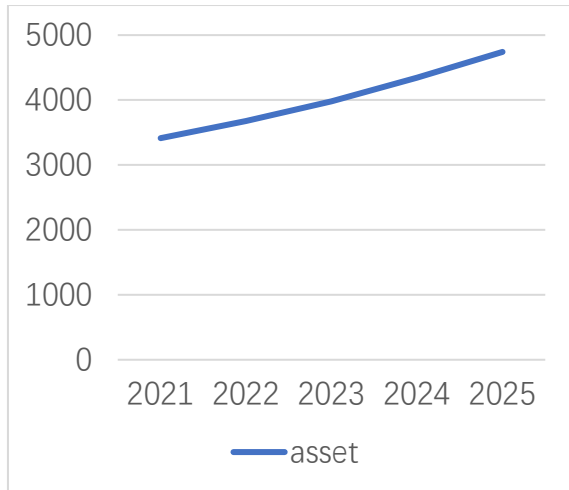


Figure 4 Prediction of Asset

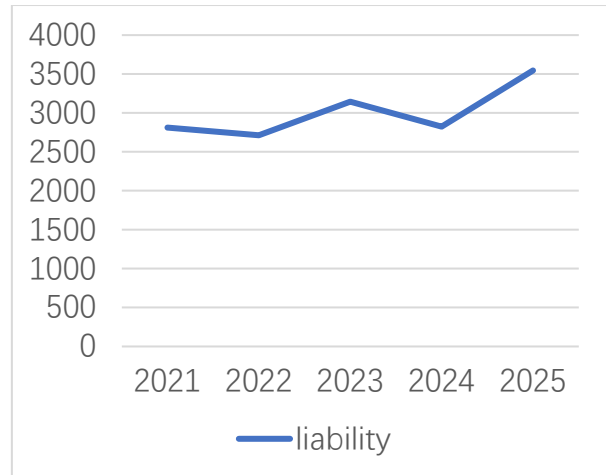


Figure 5 Prediction of Liability

3.2 Industry Analysis

Revive: Although the impact of the COVID-19 on the hotel industry will continue for a long time, the whole

industry has begun a gradual revive. The revenue of three hotel companies – Hilton, Marriott and Wyndham, started to grow again since the second quarter of 2020, after more than one year of steep declines (Figure 4).

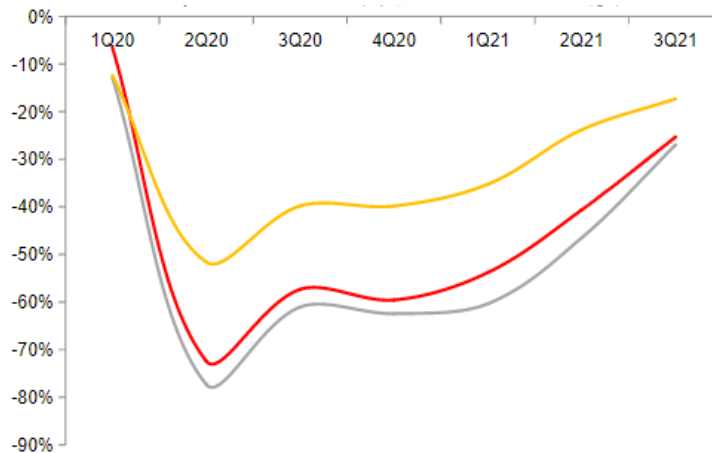


Figure 6 Industrial Tendency

Potential: the proportion of high-end hotels in mature markets, such as America and Europe, is approximately 50%, however, the value for Asia is just 27%, which means high-end hotel brands have great market potential in Asia, especially China, they could show great promise.

4.DISCUSSION

To survive the Pandemic, Hilton could adjust its capital structure. The company can adopt a resilient, capital-light business model to maintain its liquidity. Furloughs and salary cutbacks should be implemented across the board, from corporate to property levels, with furloughs and pay cuts affecting everyone from front-line staff to the CEO. To keep assets on the books and maintain financial flexibility, it might also halt capital expenditures, dividend payments, and share buybacks.

In addition, Hilton could adopt positive strategies for

its overall development in the long term. To retain customers, Hilton needs to recognize and satisfy their potential needs quickly. The epidemic shifted visitor behavior, priorities, and worries in a hurry. Hilton might respond to such a shift and reassure travelers. For example, the company could enhance the cleaning and disinfecting process to alleviate the customers' worries about exposure to the virus.

Hilton also should recognize and seize opportunities during COVID-19. It could volunteer to be quarantine service centers in order to respond to the shortage of facilities, service staff, and accommodation for quarantine, which could help the hotel to maintain service operations to help them survive the pandemic

Hilton may address certain essential, immediate needs of the areas where it works in order to develop an excellent corporate image. It may, for example, provide hotel nights to frontline medical workers fighting

COVID-19 or supply ready-to-eat meals to frontline healthcare staff. Due to the impact of COVID-19, Hilton may need to furlough its team members. Hilton might establish a fund to help team members who have been directly affected by COVID-19 or have a family member who has been affected by the virus in order to retain exceptional staff. Hilton might also provide rewards to frontline personnel for their bravery.

5.CONCLUSION

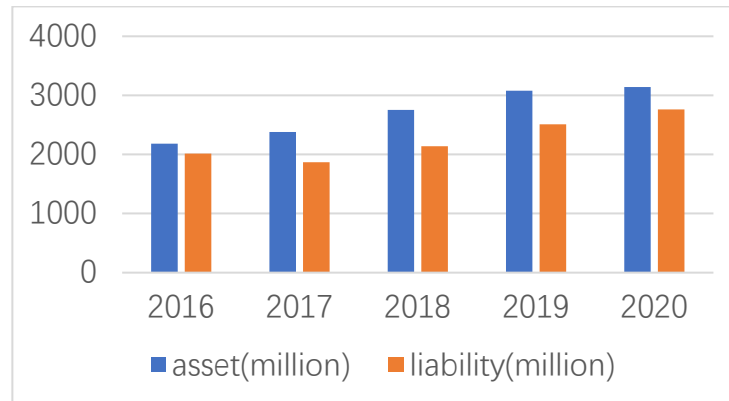


Figure 7 Historical Trend of Asset/Liability

And we mainly focused on forecasting the situation of assets and liability of Hilton in the next 5 years. To achieve this target, we applied a linear regression model as analyzing tool. Finally, we draw the conclusion that the asset of Hilton from 2021 to 2025 will demonstrate a steady upward trend, and the liability will rise in fluctuation. But the asset side can always override the liability side (Figure 5).

The drawback of this study is we did not cover extreme scenarios that might happen in the future, for instance, the change in a company's strategy, and the national policy adjustment. In the future, we will continue working on the perfection of the new model to forecast, covering some extreme events that may happen in the future, which could have a huge impact on the balance of assets and liability of Hilton.

REFERENCES

- [1] L. Song, & Y. Zhou (2020). The COVID-19 Pandemic and Its Impact on the Global Economy: What Does It Take to Turn Crisis into Opportunity? *China & World Economy*, 28(4), 1–25. <https://doi.org/10.1111/cwe.12349>
- [2] A. Oriol, A. J. Pedro, & V. Jordi (2021). COVID-19: hotel industry response to the pandemic evolution and to the public sector economic measures. *Tourism Recreation Research*, 46(2), 148–157. <https://doi.org/10.1080/02508281.2020.1826225>
- [3] H. M. S. Al-Mughairi, P. Bhaskar & A. K. H. Alazri (2021). The economic and social impact of COVID-19 on tourism and hospitality industry: A case study from Oman. *Journal of Public Affairs*, e2786–e2786. <https://doi.org/10.1002/pa.2786>
- [4] S. A. Omale, M. O. Oyenuga & C. Oriaku (2021). Effect of Organizational Culture on the Performance of Hospitality Industry in Covid-19 Era. *Abhigyan (New Delhi)*, 39(3), 24–.
- [5] M. D. Noel (2022). Competitive survival in a devastated industry: Evidence from hotels during COVID-19. *Journal of Economics & Management Strategy*, 31(1), 3–24. <https://doi.org/10.1111/jems.12446>
- [6] J. Chan, Y. Gao & S. McGinley (2021). Updates in service standards in hotels: how COVID-19 changed operations. *International Journal of Contemporary Hospitality Management*, 33(5), 1668–1687. <https://doi.org/10.1108/IJCHM-09-2020-1013>
- [7] K. I. Khan, A. Nasir & S. Saleem (2021). Bibliometric Analysis of Post Covid-19 Management Strategies and Policies in Hospitality and Tourism. *Frontiers in Psychology*, 12, 769760–769760. <https://doi.org/10.3389/fpsyg.2021.769760>
- [8] J. J. Kim, & H. Han (2022). Saving the hotel industry: Strategic response to the COVID-19 pandemic, hotel selection analysis, and customer retention. *International Journal of Hospitality Management*, 102, 103163–103163. <https://doi.org/10.1016/j.ijhm.2022.103163>

- [9] Y. Jiang, & J. Wen (2020). Effects of COVID-19 on hotel marketing and management: a perspective article. *International Journal of Contemporary Hospitality Management*, 32(8), 2563–2573. <https://doi.org/10.1108/IJCHM-03-2020-0237>
- [10] S. Park, & X. Lehto (2021). Understanding the opaque priority of safety measures and hotel customer choices after the COVID-19 pandemic: an application of discrete choice analysis. *Journal of Travel & Tourism Marketing*, 38(7), 653–665. <https://doi.org/10.1080/10548408.2021.1985038>
- [11] T. G. Hoang, N. T. Truong & T. M. Nguyen (2021). The survival of hotels during the COVID-19 pandemic: a critical case study in Vietnam. *Service Business*, 15(2), 209–229. <https://doi.org/10.1007/s11628-021-00441-0>

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

