



The role of capital structure management in maintaining the financial stability of hotel firms during the pandemic—A global investigation[☆]

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ABSTRACT

Due to the detrimental effects of the Covid-19 pandemic on the hotel sector, pandemic crisis management research has received lots of academic attention, from studies in sales-marketing to human resource management. However, financial management has been largely overlooked in the agenda of pandemic crisis management and hotel resilience. Therefore, this paper aims to address the research gap by exploring the role of capital structure management in maintaining financial stability and resilience capacities of hotel firms during this evolving and unpredictable Covid-19 pandemic. Using a database of 1882 firm-quarter observations of 196 hotel firms in 30 countries from Quarter 3 2018 to Quarter 2 2021, it is found that low debt capital structure mitigates the adverse impact of the pandemic on hotel firms' financial stability during this turbulent time; particularly the negative impacts caused by government restrictions on both domestic and international travel. The benefit of low debt levels is more pronounced for more vulnerable hotels such as small, less diversified, and slow growing hotel firms. Also, hotel firms that have less long-term debt are more financial stable and resilient during pandemic period. Research outcomes suggest that financial management, in particular capital structure policies should be a critical part of hotel resilience building and crisis management strategy for hotel firms.

1. Introduction

Due to government reactions such as border closures, travel restrictions, and quarantines, the hotel industry all over the world is dealing with the worst destructive period ever in its development history (García-Gómez et al., 2021; Gursoy and Chi, 2020; Jiang and Wen, 2020). The length, impact, and scale of the Covid-19 pandemic could surpass all previous crises, including the 9/11 terrorism attack, 2008 global financial crisis, and SARS epidemic (Le and Phi, 2021). Hotels face a huge drop in their revenues, leading to a shortage of cash to cover operating costs, which puts them in the hardest fight for survival (Courtney, 2020; Sobaih et al., 2021). Given its unexpected nature, long-lasting, and global-scale effects, this global pandemic hits the reset button for hospitality research, emphasizing the necessity of advancing our current understanding of crisis management in the hotel industry, and providing theoretical guidance for hotel recovery and prosperity in “new normal” conditions (Rivera, 2020). More importantly, critical

crisis management lessons should be explored to build a more resilient and adaptive hospitality sector in the future (Marco-Lajara et al., 2021; Pathak and Joshi, 2021).

The existing literature on disaster/crisis management research in the tourism and hospitality sector has been quickly developed over time. There are four main crisis management models proposed in pre-Covid studies: (1) the life-cycle crisis management approach (Faulkner, 2001; Fink, 1986); (2) the “action-based” or 4Rs (reduction, readiness, response, and recovery) approach (Wilks and Moore, 2004); (3) the proactive crisis management approach (Preble, 1993) and (4) the integrated crisis management model that recommends proactive strategies (reduction and readiness plans) and reactive strategies (response and recovery actions) in each specific stage of crisis management (Huang et al., 2008; Moe and Pathranarakul, 2006). Responding to this pandemic, a chaotic approach to crisis management is proposed for the hotel industry, focusing on its self-organization process to adapt to an unpredictable, complex, and evolving environment where the pandemic

[☆] A global investigation of capital structure management and financial stability of hotel firms

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may be followed by a global recession (Le et al., 2021).

Despite their different approaches, most authors agree on the importance of pre-crisis proactive strategies (crisis plan, crisis preparedness, early-crisis signal detection and warning) to build hotel resilience capacity besides reactive/responsive strategies in the crisis and post-crisis stages (impact assessment, crisis communication, recovery marketing and stakeholder collaboration) for the best crisis management outcomes (Jiang et al., 2019; King et al., 2021; Nguyen and Dinh, 2021). Research on pandemic crisis management, however, remains heavily dominated by studies on reactive/responsive measures. More specifically, researchers have investigated various policies in human resources management (Agarwal, 2021; Jung et al., 2021), marketing strategies (Davahli et al., 2020; Jiang and Wen, 2020; Kim and Han, 2022), corporate social responsibility (Shin et al., 2021); service changes (e.g., focusing more on safety and hygiene, services changes, and business innovation) (Davahli et al., 2020; Mensah and Boakye, 2021; Salem et al., 2021); digital transformation (Busulwa et al., 2022) as well as refined roles of managers during the crisis (Giousmpasoglou et al., 2021; Lombardi et al., 2021). There is a significant lack of research on effective pre-crisis proactive strategy, in particular, capital structure management to build hotel resilience capabilities in crisis situations (Wieczorek-Kosmala, 2022).

Furthermore, researchers still rely heavily on qualitative approach based on personal perspectives of hotel owners and managers (Engeset, 2020; Jung et al., 2021; Sobaih et al., 2021). Given the global scale and impacts of the Covid-19 pandemic, quantitative analysis of hotels' financial data globally is critical to enhance the reliability and generality of research outcomes. This study aims to make methodological contribution to the current literature by justifying the useful application of quantitative research in examining "best practices" and lesson learnt in pandemic crisis management.

Finally, the variations in business scales and compositions of hotel businesses could also have significant impact of hotels' crisis management capability. In the context of Covid-19 pandemic, Le and Phi (2021) highlighted how contextual factors (i.e., hotel sizes, hotel resources, and government regulations/support) could differ hotels' responses and performance outcomes. Due to these varied factors, crisis management strategy and practices might be less or more effective for each specific hotel (Pappas, 2018). Even though the impact of the pandemic on financial difficulties (Davahli et al., 2020) and hotels' value impairment (Anguera-Torrell et al., 2021; García-Gómez et al., 2021) has been examined in previous research; hotel characteristics such as size, diversification, or growth rate have not been taken into consideration in these studies in order to provide more practical suggestions for hotel managers in crisis management.

Against this background, this paper aims to address the three above-mentioned research gaps and advances the existing literature of pandemic crisis management, particularly in the area of financial management. Its contributions are threefold. First, this paper provides important insights into effective pre-crisis capital structure management practices of hotels in order to stay resilient in crisis situations. Based on quantitative analysis of hotels' data across 30 countries, it justifies that managing capital structure (low debt versus high debt and short-term debt versus long-term debt) could be a critical part of crisis preparedness and crisis resilience strategy, determining the financial stability of hotels in crisis situations. Also, the benefit of keeping low debt level is more pronounced for hotel firms with smaller size, lower sales growth, and less diversified business. Second, using a global database, this study contributes to advance the use of quantitative methods in verifying research hypotheses for more valid and generable outcomes. Given the global-scale impact of the Covid-19 pandemic and the multinational nature of hotel firms, cross-country analyses offer valuable findings. Third, the current research offers important practical implications in financial management for hotel managers and owners to build more effective crisis management strategy and adjust to "new normal" conditions.

2. Literature review

Financing decisions are extremely critical for successful management of hotel firms because of its unique characteristics of capital employment. First, hotel development and renovation are very capital intensive since they require large investments in land, buildings, furniture, and equipment (Kim, 2018; Pacheco & Tavares, 2020). In addition, hotel firms have a high fixed cost structure, with a large amount of expenses spent of regular maintenance and improvement, which is not directly relevant to turnover like in manufacturing firms (Makrigiannakis and Soteriades, 2007; Pacheco and Tavares, 2017; Sanjeev et al., 2012). Therefore, hotels often require more capital and are more heavily indebted compared to those in other industries (Andrew et al., 2007; Devesa and Esteban, 2011).

To investigate hotel firms' financial practices, capital structure is an important concept, defined as the mix of financing sources that provide the means for operating and investing activities of firms (Brealey et al., 2018). Financing sources of hotels include equity (claims on assets of shareholders) and debt (firms' obligations to creditors, which consist of short-term debt and long-term debt). Notable capital structure theories (including information asymmetry, agency conflicts, and transaction costs) argue that debt financing is less expensive than external equity financing (Jensen and Meckling, 1976; Myers and Majluf, 1984). Therefore, firms in general and hotels in particular, often opt for debt to serve their capital-intensive expansion when they do not have sufficient internal funds (Brealey et al., 2018).

The relationships of capital structure and corporates' financial performance and investments have received lots of academic attention in the capital structure literature (Aivazian, Ge, and Qiu, 2005; Berger and Udell, 2006; Detthamrong et al., 2017). This literature has established both theoretical and empirical arguments on the effects of capital structure on financial stability (Altman, 1968; ElBannan, 2021; Campbell et al., 2008), particularly during hard times. On the one hand, during the period of tight liquidity, debt can be a good source of capital that firms can rely on to cover operating expenses and survive at less expensive costs (Sudarsanam and Lai, 2001). On the other hand, debt financing incorporates an obligation to pay interest and principals (Brealey et al., 2018). During hard periods when firm revenues decrease dramatically, such an obligation can become a burden, corroding more profits, and pushing firms to more financial difficulties (Sanjeev et al., 2012). Several empirical research has documented that high leverage increases the probability of firms' going bankrupt (Campbell et al., 2008; ElBannan, 2021; Muigai et al., 2015) and impairs firms' financial performance and recovery after a crisis (Lawless et al., 2015; Sami and Mohamed, 2014). Due to the capital-intensive nature of hotel business and the highly leveraged capital structure of hotel firms, leverage can have adverse impact on hotel firms' financial stability during this recent Covid-19 pandemic. This leads to our first hypothesis:

H1. : *Hotel firms with low-debt capital structure (versus high-debt) are more (less) financially stable during the Covid-19 pandemic.*

In addition, different debt compositions incorporate different levels of risk, thereby resulting in more (less) financial stability. Specifically, short-term debt includes mostly operating liabilities such as payables to suppliers and advanced payments from customers. Such liabilities often account for a large proportion of obligations in hotel firms, providing the means for daily operation of firms without imposing any interest burden (Brealey et al., 2018). Therefore, firms can utilize these kinds of debt to gain more liquidity and overcome hard times at very low risk (García-Appendini and Montoriol-Garriga, 2013). In contrast, long-term debt is more costly and risky in terms of default risk compared to short-term debt (Landier and Thesmar, 2009). Assuming that hotel firms do not have to pay borrowing principals during the pandemic crisis, they still have to pay a large amount of interest expenses associated with long-term debt. This can exacerbate the cash shortage, aggravate losses for hotel firms, and subsequently dampen the firms' financial stability.

Therefore, we propose the following hypotheses:

H2a. *Hotel firms with less long-term (versus more long-term debt) are more (less) financially stable during the Covid-19 pandemic.*

H2b. *Hotel firms with less short-term (versus more short-term debt) are more (less) financially stable during the Covid-19 pandemic.*

Compared to other crises, the recent Covid-19 pandemic is unique since it has triggered several government reactions such as border closures and travel restrictions globally (Nguyen and Duong, 2022). These travel restrictions directly threaten the hotel industry worldwide since they result in huge revenue drop (García-Gómez et al., 2021; Gursoy and Chi, 2020; Jiang and Wen, 2020), hence, affecting the financial stability of hotels. Under the influence of such government restrictions, hotel firms have difficulties in sustaining internal capital and generating cash. In this regard, a reasonable level of debt can be a crucial resource for them to solve the cash shortage problem and stay survive (Campello et al., 2012; Sudarsanam and Lai, 2001). In contrast, highly indebted firms experience stronger negative effects of recession (Duchin et al., 2010), leading to deeper losses and higher risk of failure because of the principal and interest payment burden (Orazalin et al., 2019; Shim, 2017). Therefore, a high-debt capital structure can worsen the impact of government restrictions on the financial situation of hotel firms. We, thus, propose our third hypothesis:

H3. *Hotel firms with low-debt capital structure (versus high-debt) are less (more) impacted by the governments' travel restrictions during the Covid-19 pandemic.*

Finally, large hotel firms tend to have stronger financial resources (Ohlson, 1980), which allow them to afford operating expenses during downturn markets (Altman, 1968). Therefore, those firms can be more stable in withstanding a crisis (Duchin et al., 2010; Shim, 2017). In this regard, a capital structure with a lower level of debt can be less beneficial in supporting those firms' financial stability during a crisis. Similarly, hotel firms with high sales growth tend to have large cash generated from sales, therefore, they are more financially stable during crises (Nguyen et al., 2021; Song et al., 2021). In the specific case of the Covid-19 pandemic, hotel firms with a history of higher sales growth can still be more appealing to customers, thus can attract more bookings compared to those having a record of low sales growth. Thus, the former group of hotel firms can better sustain the Covid-19 pandemic and therefore cannot benefit as much from a low-leverage capital structure as hotel firms with lower sales growth.

In addition, firms that have diversified businesses are often less risky than undiversified firms (Rugman, 1976). During the Covid-19 pandemic, the hotel industry is among the most affected sectors, therefore, if hotel firms diversify their business by having investments in other sectors, the adverse impact of the pandemic on their financial stability can be less severe (Shim, 2017). If it is the case, the role of capital structure in mitigating the negative impact of the pandemic can be less obvious. Altogether, we propose the following hypothesis:

H4. *Capital structure management is more effective for vulnerable hotels that are relatively small, less diversified, and slow growing in crisis management.*

3. Methodology

3.1. Data collection process

This study employs a sample of hotel firms under the Standard Industrial Classification (SIC) code 7011 (Hotels and Motels) for the period from Quarter 3, 2018 to Quarter 2, 2021. Financial data of these hotel firms are collected from the COMPUSTAT and COMPUSTAT Global databases. This study only examines hotel firms whose quarterly debt ratios remain higher/lower than the median debt ratio across all firms in each quarter for all quarters in our studied period. This approach allows

us to contrast between hotel firms that consistently adopt low debt capital structure and those having high debt structure. A common practice to alleviate the problem of outliers and data errors in corporate finance literature (i.e., ElBannan, 2021; Kim et al., 2019) is adopted by winsorizing all continuous variables at the 1% and 99% percentiles. To this end, our empirical analysis is conducted on a dataset of 1882 firm-quarter observations of 196 hotel firms in 30 countries.

3.2. Data analysis

To examine the impact of capital structure on hotel firms' financial stability during the Covid-19 pandemic, the following baseline regression model is employed:

$$Zscore_{i,t} = \delta_1 + \delta_2 Post\ Covid_i + \delta_3 Low\ Capital\ Structure_i + \delta_4 Low\ Capital\ Structure_i \times Post\ Covid_i + \delta_5 Controls_{i,t} + FEs + \epsilon_{i,t} \quad (1)$$

where $Z-Score_{i,t}$ captures the financial stability of hotel firm i in quarter t . $Z-score$ is used as a common measure of firm stability in the corporate finance literature (e.g., Agostino and Trivieri, 2018; Orazalin et al., 2019; Saidane and Abdallah, 2021). It is calculated as the sum of a firm's return on assets (ROA) and the equity-to-assets ratio (*Equity*), divided by the standard deviation of its return on assets (*SDROA*). *Low Debt* is a time-invariant dummy variable which equals one if a hotel firm's debt-to-assets ratio is consistently lower than or equal to the median value in all sampling quarters, and zero if its debt-to-assets ratio is consistently higher the median value in all quarters. In accordance with Aivazian et al. (2005), Hanousek and Shamshur (2011), and Liu et al. (2020), debt capital structure is measured as the ratio of total liabilities to total assets. *Post-Covid* is a dummy variable that takes the value of one for the post Covid-19 period (from Quarter 1, 2020 to Quarter 2, 2021), and zero otherwise.

Two control variables are also incorporate into the model, namely *Firm Size*, measured as the natural logarithm of total assets, and *Sales Growth*, which is the quarterly growth rate of sales revenue. These two control variables have been suggested as the most common determinants of firms' financial stability (Morrish and Jones, 2020; Nguyen et al., 2021; Orazalin et al., 2019). Specifically, larger firms tend to be more diversified, therefore, they have lower bankruptcy risk than small firms (Ohlson, 1980). In addition, large firms have large internal funds that allow them to sponsor operations during turbulent periods (Altman, 1968). Therefore, firm size can enhance firms' financial stability and accelerate recovery after a period of recession (Orazalin et al., 2019; Song et al., 2021). At the same time, firms with high sales growth may have large cash generated from sales, which allow them to stay more financially stable during a crisis (Orazalin et al., 2019; Song et al., 2021). We also include quarter fixed effects (*Quarter FEs*) and firm fixed effects (*Firm FEs*) in the model to account for firm heterogeneity and any economic, regulatory, and/or political changes across the studied timeline. The standard errors are robust to heteroscedasticity and clustered at the firm level.

The summary statistics of all variables used in our analysis are provided in Table 1. The average level of hotel firm stability, which is

Table 1
Summary statistics.

	N	Mean	S.D.	Min	p50	Max
<i>Z-score</i>	1882	14.4488	15.8717	-5.0378	10.1802	83.0836
<i>Post Covid</i>	1882	0.4426	0.4968	0.0000	0.0000	1.0000
<i>Low Debt</i>	1882	0.4724	0.4994	0.0000	0.0000	1.0000
<i>Firm Size</i>	1882	8.1060	2.5981	1.9203	8.1336	15.4783
<i>Sales Growth</i>	1882	0.2283	1.4474	-0.9942	0.0000	12.6406

Note: This table presents the summary statistics of all variables in this study. All variables are winsorized at a 1% level in both tails. The definitions for all variables are outlined in Appendix 1.

proxied as the Z-score, is 14.4488, and its standard deviation is 15.8717. The mean value of *Post Covid* is 0.4426, implying that 44.26% of the firm-year observations are in the post COVID-19 period. It is also documented that 47.24% of firms have a low debt capital structure, which is indicated by the mean value of 0.4724 of *Low Debt*. *Firm Size* of hotel firms in our sample has the mean (standard deviation) of 8.1060 (2.5981). Finally, *Sales Growth* takes a mean (standard deviation) value of 0.2283 (1.4474), suggesting that hotel firms in our sample have a very high growth rate.

4. Findings and hypothesis testing results

4.1. Testing hypothesis 1

Our test results for Hypothesis 1 are reported in Table 2. Column 1 documents the regression results when we regressed Z-score against *Post Covid*, *Low Debt* and the control variables. Column 2 shows the results when the interaction between *Post Covid* and *Low Debt* was added to the regression model. And in Column 3, firm fixed effects and quarter fixed effects were added to the model to control for firm heterogeneity and any economic, regulatory, and/or political changes across the studied timeline. Results show that the Covid-19 pandemic has negative impacts on the Z-score of hotel firms, with the coefficients being significant at the 1% level in all regressions. At the same time, the coefficient of *Low Debt* is positive and significant in Column 1 and 2, suggesting that hotel firms that utilize a policy of having low debt levels are, on average, more financially stable than those that have high debt levels.¹ More importantly, the coefficient of the interaction *Post Covid* × *Low Debt* is always positive and statistically significant, which means the low debt policy allows hotel firms to mitigate the adverse impact caused by the Covid-19 pandemic.

Moreover, the coefficient of *Post Covid* is - 2.3406, given that the mean value for Z-Score in our sample is 14.4488, this means Z-score of hotel firms is reduced by 16% (i.e., 16% = 2.3406/14.4488) during the Covid-19 pandemic. The coefficients of the interaction *Post Covid* × *Low Debt* is 0.6063, significant at the 5% level, which is one-fourth of the

Table 2
Hypothesis 1 testing.

	Dependent variable: Z-score		
	(1)	(2)	(3)
<i>Post Covid</i>	-1.6003 *** (0.1285)	-1.8898 *** (0.1498)	-2.3406 *** (0.2803)
<i>Low Debt</i>	15.0604 *** (2.3911)	14.8629 *** (2.3897)	
<i>Post Covid</i> × <i>Low Debt</i>		0.5961 ** (0.2901)	0.6063 ** (0.2985)
<i>Firm Size</i>	-0.3278 (0.7848)	-0.2330 (0.7783)	-0.1117 (0.9922)
<i>Sales Growth</i>	0.1009 *** (0.0281)	0.0989 *** (0.0274)	0.0900 *** (0.0290)
<i>Constant</i>	11.2592 * (6.4670)	10.6080 * (6.3965)	16.5775 ** (8.0146)
Firm FEs	NO	NO	YES
Quarter FEs	NO	NO	YES
R-squared	0.2170	0.2238	0.2496
Observations	1882	1882	1882

Note: This table presents our baseline results (Eq. 1) of the impact of capital structure on hotel firms' financial stability during the Covid-19 pandemic. The definitions for all variables are outlined in Appendix 1. Robust standard errors are in parentheses. ***, **, and * denote statistical significance at 1%, 5%, and 10% levels, respectively.

¹ Since *Low Capital Structure* is a firm-level dummy variable and it is time-invariant, this variable is omitted in Column 3 with the inclusion of firm fixed effects.

coefficient of *Post Covid*. This means the adverse impact of Covid-19 on hotel firms' financial stability is reduced by around 25% if the firms utilize a low-debt policy.

Overall, these results support Hypothesis 1 which states that hotel firms with low-debt capital structure are more financially stable than those with high-debt capital structure during the Covid-19 pandemic.

To ensure the validity of our main finding for Hypothesis 1, several robustness checks were performed including (1) using lagged control variables in our regression, (2) adopting an alternative method to classify high and low-debt hotel firms, (3) utilizing an alternative industry classification (i.e., North American Industry Classification System – NAICS) to identify hotel firms. All robustness tests offered consistent results (Please check the details robustness tests in Appendix 2).

Additional tests were run to control for endogeneity issues, which include (1) taking the average value for all right-hand-side variable during the pre-Covid period whilst taking the average value for the dependent variable during the post-Covid period, (2) using propensity score matching to pair hotel firms with low-debt capital structure with comparable hotel firms with high-debt structure. In both tests, the results are largely consistent with our findings in Table 2. The details of endogeneity tests are provided in Appendix 3.

4.2. Testing hypothesis 2

Hypothesis 2a. and 2b are tested by exploring how different debt maturity can affect the financial stability of hotel firms during the Covid-19 pandemic. Specifically, the long-term debt ratio (i.e., long-term liabilities/total assets) and short-term debt ratio (i.e., short-term liabilities/total assets) and how these two ratios affect hotel firms' financial stability were examined.

First, hotel firms were classified into those that have high and low long-term debt ratios. These are firms having their quarterly long-term debt ratios remain higher/lower than the median value of each quarter for all quarters in our studied period. The regression model (Eq. 1) was rerun and the results are reported in Column 1 of Table 3. The coefficient of *Post Covid* is - 2.7651 and the coefficient of *Post Covid* × *Low Long-term Debt* is 1.0419, both are significant at the one percent level. This means the capital structure with low long-term debt allows hotel firms to stay financially stronger during the Covid-19 pandemic. Specifically, the risk coming from the pandemic is reduced by almost 38% (i.e., 38% = 1.0419/2.7651). This finding provides support to

Table 3
Analyses of debt maturity.

	Dependent variable: Z-score	
	(1)	(2)
<i>Post Covid</i>	-2.7651 *** (0.3031)	-2.1865 *** (0.6004)
<i>Post Covid</i> × <i>Low Long-term Debt</i>	1.0419 *** (0.3238)	
<i>Post Covid</i> × <i>Low Short-term Debt</i>		0.5218 (0.4425)
<i>Firm Size</i>	0.3128 (0.8621)	-0.3813 (0.6802)
<i>Sales Growth</i>	0.0739 *** (0.0230)	0.0944 ** (0.0442)
<i>Constant</i>	13.3162 * (6.8911)	19.0377 *** (5.6629)
Firm FEs	YES	YES
Quarter FEs	YES	YES
R-squared	0.2996	0.2560
Observations	1642	952

Note: Note: This table documents our regression results (Eq. 1) when we replace *Low Debt* by *Low Long-term Debt* and *Low Short-term Debt*. The definitions for all variables are outlined in Appendix 1. Robust standard errors are in parentheses. ***, **, and * denote statistical significance at 1%, 5%, and 10% levels, respectively.

Hypothesis 2a.

Next, hotel firms were classified into those that have high and low short-term debt ratios before the regression model was rerun with this reclassified sample. Results reported in Column 2 of Table 3 show that although the coefficient of *Post Covid* remains negative and significant, and the coefficient of *Post Covid* × *Low Short-term Debt* is statistically insignificant. This suggests that the short-term debt level does not moderate the impact of the Covid-19 pandemic on hotel firms' financial stability. This result, therefore, fails to support our Hypothesis 2b.

4.3. Testing hypothesis 3

To test Hypothesis 3, three variables were employed to measure the degree of government response to the pandemic, which include *Stringency* being the index that records the strictness of governmental lockdown policies, *Internal Movement Restriction* representing the level of restriction in domestic movement, and *International Travel Restriction* representing the level of restriction in international travel. Those indices are retrieved from the Oxford COVID-19 Government Response Tracker database (<https://www.bsg.ox.ac.uk/research/research-projects/covid-19-government-response-tracker>). Since almost 30% of hotel firms in our sample have operations in multiple countries and hotels in each country can also be affected by other countries' restriction leading to lower booking from foreign tourists, the average index across all available countries in the Oxford COVID-19 Government Response Tracker database was calculated for each of our measure of government response. The regression model (Eq. 1) was modified: *Post Covid* and *Post Covid* × *Low Debt* was replaced by each of our government response measures and its interaction with *Low Debt*.

The results of regressions using this modified model are reported in Table 4. First, Column 1 shows that the coefficient of *Stringency* is - 0.0386, significant at the one percent level, whilst the coefficient of *Stringency* × *Low Debt* is 0.0088, significant at the ten percent level. This

Table 4
Hotel capital structure and the impact of governmental policies to respond to the Covid-19 pandemic.

	Dependent variable: Z-score		
	(1)	(2)	(3)
<i>Global Stringency</i>	-0.0386 *** (0.0047)		
<i>Global Stringency</i> × <i>Low Debt</i>	0.0088 * (0.0051)		
<i>Global Movement Restriction</i>		-2.4821 *** (0.3008)	
<i>Global Movement Restriction</i> × <i>Low Debt</i>		0.4772 * (0.2784)	
<i>Global International Travel</i>			-0.8138 *** (0.0984)
<i>Global International Travel</i> × <i>Low Debt</i>			0.1936 * (0.1029)
<i>Firm Size</i>	-0.1335 (0.9976)	-0.1463 (0.9977)	-0.1268 (0.9949)
<i>Sales Growth</i>	0.0886 *** (0.0293)	0.0883 *** (0.0294)	0.0882 *** (0.0292)
<i>Constant</i>	16.7519 *** (8.0585)	16.8546 *** (8.0599)	16.6990 *** (8.0365)
Firm FEs	YES	YES	YES
Quarter FEs	YES	YES	YES
R-squared	0.2475	0.2469	0.2484
Observations	1882	1882	1882

Note: This table documents our regression results (Eq. 1) when we replace *Post Covid* by three measures of the degree of government response to the pandemic, which include *Stringency*, *Movement Restriction*, and *International Travel*. The definitions for all variables are outlined in Appendix 1. Robust standard errors are in parentheses. ***, **, and * denote statistical significance at 1%, 5%, and 10% levels, respectively.

means, on average, the stringency of government policies to respond to the Covid-19 pandemic is negatively related to hotel firms' financial stability. However, a low debt capital structure can reduce this negative impact by almost 23% (i.e., 23% = 0.0088/0.0386). Similarly, our results in Column 2 and 3 show that government restrictions on both domestic movement and international travel exert negative impacts on hotel firms' financial ability. However, this adverse impact is reduced for hotel firms with lower financial leverage. Specifically, the negative impact of domestic movement restriction is reduced by 19% (i.e., 19% = 0.4772/2.4821), whereas the impact of international travel restriction is reduced by 24% (i.e., 24% = 0.1936/0.8138) for low-debt hotel firms.

Altogether, the results in Table 4 suggest that the low debt capital structure can reduce the negative impact that hotel firms suffer from government policies to respond to the Covid-19 pandemic, particularly restrictions on both domestic and international travels, which support Hypothesis 3.

4.4. Testing hypothesis 4

Hypothesis 4. was tested by examining whether the benefit of maintaining low debt levels is the same across all hotel firms of different firm sizes by rerunning our regression model (Eq. 1) for two subsamples of small-size and large-size hotel firms and report the results in Column 1 and 2 of Table 5. Large/small-size hotel firms are defined as those that have their total assets higher/lower than the median value. The coefficient of the interaction term *Post Covid*×*Low Debt* is only positive and significant for the group of small hotels. This is consistent with our hypothesis that only hotel firms of smaller size can benefit from a low debt capital structure during the Covid-19 pandemic.

To examine whether the impact of capital structure on financial stability of hotel firms during the Covid-19 pandemic is the same for those firms that only invest in hotels (less diversified) versus those having a small share of their investment in other sectors (more diversified), we rerun our regression model (Eq. 1) on these two subsamples and report the results in Column 3 and 4 of Table 5. Consistent with our expectation, we find that the coefficient of the interaction term *Covid*×*Low Debt* is only positive and significant for the group of hotel firms that do not diversify their business. This means the impact of capital structure on financial stability during a crisis is more pronounced for hotel firms that have no business diversification.

Finally, the regressions model (Eq. 1) was rerun for two subsamples of hotel firms that have high and low sales growth (i.e., having their sales growth higher/lower than the median value). The results, reported in Column 5 and 6 of Table 5, show that the coefficient of the interaction term *Post Covid*×*Low Debt* is only positive and significant for the group of low sales growth hotels. This supports Hypothesis 4 that the benefit of having a low debt capital structure is more pronounced for hotel firms that have lower sales growth rate. Overall, our results in Table 5 support Hypothesis 4 that the low debt policy is more beneficial for hotel firms that are more vulnerable to a crisis.

Altogether, the results of our hypothesis testing are summarized in Table 6. Hypotheses 1, 2a, 3 & 4 are supported while hypothesis 2b is not supported. Further discussion of the results is provided in the next section.

5. Discussion

This paper makes significant theoretical contributions by addressing the call for further research on investigating proactive crisis management measures and organizational resilience (Le and Phi, 2021; Ritchie and Jiang, 2019) and exploring financial management, an understudied area in pandemic crisis management (Wieczorek-Kosmala, 2022). In addition, this study consists of a global investigation, using quantitative data of hotel firms across 30 countries to ensure the reliability and the generality of research outcomes, and contribute to advance research

Table 5
Subsample analyses.

	Dependent variable: Z-score					
	Firm Size		Diversification		Sales Growth	
	Small Hotels	Large Hotels	More diversification	Less diversification	Low Sales Growth	High Sales Growth
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Post Covid</i>	-2.0860 *** (0.3597)	-2.7088 *** (0.4139)	-2.0468 *** (0.5180)	-2.3959 *** (0.3393)	-2.4868 *** (0.3200)	-1.6503 *** (0.3721)
<i>Post Covid</i> × <i>Low Debt</i>	0.6176 * * (0.3090)	0.6648 (0.5069)	0.2624 (0.6003)	0.6836 * (0.3525)	0.6928 * * (0.2993)	0.4599 (0.3757)
<i>Firm Size</i>	-1.3542 (0.8891)	0.9717 (1.5248)	0.5958 (2.0829)	-0.2105 (1.1498)	-0.3625 (0.9238)	-0.0239 (1.1380)
<i>Sales Growth</i>	0.1013 * * * (0.0328)	0.0496 (0.0506)	0.2375 * * * (0.0501)	0.0709 * * (0.0290)	0.7676 * * (0.3034)	0.0403 (0.0508)
<i>Constant</i>	23.0081 * * * (5.4546)	6.8939 (15.3117)	13.3568 (16.7525)	16.6631 * (9.3019)	19.3827 * * * (7.3420)	14.7896 (9.4111)
Firm FEs	YES	YES	YES	YES	YES	YES
Quarter FEs	YES	YES	YES	YES	YES	YES
R-squared	0.2491	0.2653	0.2142	0.2665	0.3058	0.2014
Observations	943	939	425	1457	1053	829

Note: This table presents our regression results (Eq. 1) for different subsample. In Column 1 and 2, we examine the impact of capital structure on the financial stability of small and large-size hotel firms. We define large/small-size hotel firms as those that have their total assets higher/lower than the median value. In Column 3 and 4, we report our regression results for the subsample of holding companies which mainly invest in hotels but also invest in other sectors (more diversification) and non-holding companies which only invest in hotels (less diversification). In Column 5 and 6, we compare between hotel firms of low and high sales growth. These two groups of hotel firms are identified based on whether they have sales growth higher/lower than the median value. The definitions for all variables are outlined in Appendix 1. Robust standard errors are in parentheses. * * *, * *, and * denote statistical significance at 1%, 5%, and 10% levels, respectively.

Table 6
Summary of hypothesis testing.

Hypothesis	Relationship	Result
H1	Low-debt capital structure → Financial stability during Covid-19 pandemic	Supported
H2a	Low long-term debt capital structure → Financial stability during Covid-19 pandemic	Supported
H2b	Low short-term debt capital structure → Financial stability during Covid-19 pandemic	Not supported
H3	Low-debt capital structure → Financial stability under the impact of the governments’ restrictions during Covid-19 pandemic	Supported
H4	Low-debt capital structure → Financial stability during Covid-19 pandemic for vulnerable hotel firms	Supported

methodology dominated by qualitative research in crisis management literature. Regarding practical contributions, research outcomes provide valuable insights and suggestions for “best practices” in capital structure management as a critical part of crisis readiness and crisis resilience strategy.

5.1. Theoretical contributions

While previous studies mostly focus on the importance of financial management in enhancing hotels’ profitability (Babajee et al., 2020; Zeglal and Zigan, 2013), sales growth (Chen and Chang, 2012), and stock performance (Chen, 2011; García-Gómez et al., 2021); this paper advances current understanding on the critical role of capital structure management policies in pandemic crisis management. Results of data analysis show that low-debt hotel firms tend to be more profitable and more financially resilient than firms with a high level of debt, possibly because low-debt firms can avoid interest and principal repayment burdens, and therefore utilize limited cash flows to serve day-to-day operations (Babajee et al., 2020; Orazalin et al., 2019; Sanjeev et al., 2012).

This study provides evidence to go against the common belief of using debt as a good source of capital to cover operating expenses and survive at less expensive costs during the period of tight liquidity (Campello et al., 2012; Sudarsanam and Lai, 2001). In the context of a complex and evolving pandemic, debt dependency backfires and

threatens hotel firms’ financial stability. Given that hotel firms are more heavily indebted compared to those in other industries (Andrew et al., 2007; Devesa and Esteban, 2011), they are more vulnerable in crisis situations. This study aligns with findings from a recent study by Wiczorek-Kosmala (2022), emphasizing the necessity of cash holdings to avoid debt and thus to improve resilience capacities of tourism and hospitality businesses.

More specifically, this study clarifies that different debt compositions incorporate different levels of risk, thereby having different impact on financial stability. When hotel firms must rely on debt to survive in crisis situations, long-term debt negatively impacts financial stability, but short-term debt does not have significant influences. Our findings are supported by prior studies in other sectors, which also confirm that long-term debt is more costly and risky since it causes large financial burden and consequently dampens the firms’ financial stability (Landier and Thesmar, 2009). In contrast, short-term debt imposes less critical financial threats for firms (Brealey et al., 2018).

Hotel firms with low-debt capital structure are found to be more financial stable and less impacted by government travel restrictions. While travel restrictions directly threaten the hotel industry worldwide and result in substantial revenue drop (García-Gómez et al., 2021; Gursoy and Chi, 2020; Jiang and Wen, 2020), highly indebted firms experience more negative effects. Similar findings were provided in previous studies in the context of several economic recessions (Duchin et al., 2010; Orazalin et al., 2019; Shim, 2017).

Following suggestions in an exploratory study of Le and Phi (2021), our research findings provide quantitative evidence to demonstrate that effective crisis management and resilience capacities of hotel firms depend on several characteristics (i.e., size, business diversification, growth rate). Hotel firms, that are relatively small sized, less diversified, and slow growing, would be more threatened by high levels of debt. This is because large firms often have stronger financial resources and can afford operating expenses during downturn markets (Orazalin et al., 2019; Song et al., 2021). Also, firms that have diversified businesses are less risky than undiversified firms because they can rely on other revenue sources to compensate for the decrease in one business area (Rugman, 1976; Shim, 2017). Finally, firms with high sales growth tend to have large cash generated from sales, therefore, they are more financially stable during crises (Nguyen et al., 2021; Song et al., 2021).

5.2. Methodological contributions

Given the global-scale impact of the Covid-19 pandemic and the multinational nature of hotel firms, cross-country analyses are absolutely essential to increase the reliability and generality of research outcomes (Le and Phi, 2021). Case studies involving a small sample of hotels in one or several countries were employed in previous studies (Kim and Han, 2022; Ntounis et al., 2021; Song et al., 2021; Wieczorek-Kosmala, 2022; Yang et al., 2021), consisting of a weakness in the current literature. In this study, data analyses are performed on an extended sample of 196 hotel firms in 30 countries all over the world. Moreover, the studied period spreads from Quarter 3 2018 to Quarter 2 2021, including hotels' financial observations from pre-pandemic to pandemic crisis period, offering a comprehensive consideration of the pandemic impact. Therefore, this study provides a good example of using quantitative data to identify "best practices" in pandemic crisis management.

5.3. Practical implications

Based on our research outcomes, two key managerial implications are proposed for hotel firms to be more financially stable and resilient in current pandemic crisis situations as well as in future crises: (1) maintaining a low-debt capital structure and (2) utilize short-term financing offered by business partners (rather than long-term debts) to avoid the financial burden during crisis periods. These two policies are necessarily included in crisis management strategy, specifically for hotel firms located in countries where governments have strict travel restrictions to control the pandemic. Also, the owners and managers of vulnerable hotels that are relatively small, less diversified, and slow growing, must pay close attention to financial control and the maintenance of a healthy capital structure, with low-debt and small proportion of long-term debt.

Regarding policy recommendations, this study suggests that government support - for example, tax reduction and low-interest loans for vulnerable hotel firms - is critical to improve hotel firms' financial stability and resilience. Given that most tourism and hospitality companies do not hold a buffer of cash (Wieczorek-Kosmala, 2022) and often highly indebted (Devesa and Esteban, 2011), debt pressure and cash shortage could induce bankruptcy waves in the hotel sector.

6. Limitation and directions for future research

As a pioneering attempt to explore the role of financial management in pandemic crisis management strategy, this study is subject to several limitations. First, it focuses only on capital structure and overlooks other aspects of financial management such as dividend payout, working capital management, and corporate governance. To extend our understanding of financial management in pandemic crisis management, these aspects should be explored in future studies. Second, it mainly relies on financial data from the COMPUSTAT and COMPUSTAT Global databases for testing research hypotheses. Given that firms appearing in the databases are only those which still survive, our conclusions are subject to survivorship bias. Third, this study isolates the impact of capital structure from other crisis management efforts of hotel firms (e.g., sales, marketing, human resource management, etc.). Researchers who seek to understand the interdependence between these areas could collect relevant data and conduct more in-depth analysis.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the

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