Insidious Impact of the COVID-19 Pandemic on Leverage of the Tourism and Hospitality Sector in India

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The COVID-19 pandemic has had a massive cascading effect on the entire tourism and hospitality sector, acting as a demand shock, affecting not only customary travellers but also wiping out any transient demand. The upside of these difficult circumstances is that they can be used to test the sector's resilience. In this context, this paper analyses the deleveraging risk that industry players in India face by employing a qualitative response model, 'Logit'. The study concludes that the deleveraging risk that sector players face depends upon the amount of debt and leverage ratios, both during the pre-and post-pandemic period. However, the influence of other financial indicators on deleveraging has been different in terms of its intensity and bi-directional impact. Moreover, during COVID-19 deleveraging tendencies were noticed only in 204 firms, compared to 242 firms before COVID-19, discrediting the forced deleveraging as predicted in the literature.

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Introduction

Tourism is one of the vibrant sectors of the economy, accounting for 29 percent of the world's services exports and generating employment for 300 million people globally (United Nations Conference on Trade and Development 2020). The tourism sector in India contributes around $194bn, or 6.9%, to total GDP while employing 30.80 million people and

was expected to grow to $512bn by 2028 (Statista 2021). However, the COVID-19 pandemic has disturbed the significant aspects of the travel and hospitality sector; therefore, to achieve the pre-pandemic position is an uphill task. The pandemic has overwhelmingly affected the countries in Asia, leading to an estimated USD 2.7 trillion decline in world travel and tourism GDP (World Travel and Tourism Council 2020). Nearly 65 percent of the experts from UN Tourism (2022) reiterate that this sector will not recover before 2024. As of 2022, international tourist arrivals are closer to the late 1980s level, about 72 percent lower than the pre-pandemic level. It is significantly lower than the past episodes of epidemics or economic recessions (EHL Insights 2022). As economists predict, firms will now move to the 'new normal' - the so-called 90% economy (The Economist 2020). Keeping in view this scenario, currently the sustainability of the industry participants seems to be minimal but they should take strides to achieve the new normal level sensibly and cautiously.

The paper aims to test the resilience of the Indian hospitality and travel firms given the amount of leverage in their balance sheets and to highlight the financial variables that may lead to deleveraging, comparing the pre-COVID era to the COVID era. This helps to understand the crucial variables that play a role in determining the deleveraging dynamics for the firm in normal vs shock periods and unearth whether Indian firms faced the forced deleveraging suggested in debt cycle theory.

The paper is organised as follows. The second section details the review of literature, organised into three sections: the current scenario, the leverage dynamics and the nexus between debt and deleveraging. The third section consists of the data and methodology, which is followed by results and discussion in the fourth section. Finally, the fifth section concludes the paper.

Review of Literature

LEVERAGE DYNAMICS IN THE HOSPITALITY INDUSTRY

The presence of leverage in a firm's capital structure has remained a matter of interest among researchers. While some have argued that it is a relevant financial decision for determining the value of the firms (Gordon 1962; Walter 1963), others have argued it is an irrelevant decision (Modigliani and Miller 1958). It is argued that debt offers a differential advantage to the firms, being a cheaper source of finance, and can be utilised to expand productive capacity and shorten the turnover time, thereby augmenting the power of the borrowing entity (Hilferding 1981; Veblen

1904). However, recent history demonstrates that though financial leverage allows a borrower to expand business assets, thereby increasing gains in good times, on the other hand, it has a multiplying effect on the value of the firm during bad times. The debt can be used to jack up the shareholders' wealth and give impetus to the firm's power (Robbins and Di Muzio 2016). Contrarily, it has the power to increase vulnerability to downside shocks (Turner 2017).

The hospitality industry is unique because it is capital-intensive, having substantial investment properties and other fixed assets such as buildings, furniture, fixtures and equipment, which increases the share of fixed operating costs in their total cost. The existence of fixed operating costs and fixed financial costs (i.e. interest on debt capital) inflates their degree of combined leverage, and any volatility in their earnings will severely impact their valuation (Enz and Potter 1998; Peng et al. 2015). Hospitality firms use heavy debt to support their fixed-asset investments, particularly long-term debt financing (Singh and Upneja 2008). Also, they incur high fixed operating costs such as property taxes, management fees, and engineering and maintenance costs, which are impossible to eliminate (Upneja and Dalbor 2001). The high level of leverage required by hospitality firms and their high operating costs entails maintenance of high liquidity, a feature of paramount importance. It is mainly due to operating and financial leverage that these firms perform poorly relative to other firms during economic downturns, as the revenue stream has a high correlation to the macroeconomy. A decline in hotel profitability has severe implications for the hotel owner and lenders as the debt service ability gets impaired (Woodworth and Mandelbaum 2010). The problem will swell up when the revenue per available room (RevPAR) declines drastically (Corgel and Gibson 2016). The travel and hospitality sectors are highly cyclical and seasonal, with stability largely susceptible to sharp upcycles and deep downcycles. The tourism industry often finds itself overwhelmed by social or political instability, economic or natural uncertainties and an increased risk of terrorism and climate change (Williams and Baláž 2015). In such cases, a marginal decline in sales volume can lead to a sharp decline in profits and cash flows available for debt servicing. Stress analysis for major hotel companies revealed that a 25% revenue decline for major chains would result in many companies grappling for survival (Agrawal 2020).

The recent banking crisis adds to industry woes as credit availability has become scarce. Amid the dispirited economic growth, rising un-

certainties and policy fiascos, the industry might witness several hotel projects and airliners defaulting on debt. With bankers becoming highly selective in providing development finance for hotel projects and airlines in view of expected defaults and rising Non-Performing Assets from all major sectors, establishing credibility for extended finance will be difficult. Therefore, the credit impact of the pandemic on the hospitality sector will have short- and long-term effects. The immediate implications for loss of revenues and dwindling cash flows will lead to problems with debt service obligations. The higher leverage means firms are susceptible to delinquency, with survival requiring pruning all costs, fixed and variable. However, this will affect the guest experience, followed by a decline in occupancy and an associated drop in the average rate of return of an already stressed balance sheet. In the long run, it may affect the total valuation of these firms (Riaz 2020).

The policy choices of the government will determine whether COVID-19 will be followed by zombification,[1] bankruptcies, consolidation or debt deleveraging. One of the policy choices for the government is to extend credit to these distressed firms or extend state guarantees, both of which are artificial measures that will prevent the exit of unproductive firms from the market, leading to growth in the number of zombie firms. It is estimated that COVID-19 may result in widespread bankruptcies as hotels may shut down due to rising credit levels. However, the government's focus on flattening the insolvency curve makes private debt resolution or restructuring the priority (Aharon et al. 2021).

NEXUS OF DEBT-AT-RISK AND DELEVERAGING

The empirical research on the various crisis episodes has established the leverage–sustainability nexus, with a highly leveraged borrower facing substantial losses on high debt service costs. It unfolds two aspects of leveraged positions of organisations. First, the majority of market downturns are accompanied by deterioration in the value of assets. If the value of the assets drops lower than the value of the debt, the risk of default increases (Kiyotaki and Moore 1997). Second, the loss of income makes highly leveraged firms more susceptible to bankruptcy to service the debt. In both instances, deleveraging follows, contrary to the 'beautiful deleveraging' referred to by Ray Dalio in his book. The deleveraging Dalio referred to is forced and will reduce the market volatility on the borrowers' balance sheet and exchange current returns for future risks (Dalio 2018). However, the deleveraging necessitated due to crises is forced and ugly. It is

driven by the need to cover financial costs leading to capital depletion, to reduce risks and prevent defaults. Such a scenario usually shifts lenders' attitudes to a more conservative approach, demanding more collateral, down payment, and higher interest rates to cover the higher associated risk. Specifically, in the aftermath of a crisis, the level of investment is held back due to debt accumulated during the boom years. The tightening of lending conditions and weak credit supply is called 'debt overhang' (Cuerpo et al. 2013; Kalemli-Ozcan, Laeven, and Moreno 2018).

The rapid deleveraging, cutting down of consumption, and depressing demand is the outcome of debt overhang. A study by Eggertsson and Krugman (2012) studied how the debt overhang forces highly indebted firms to go for rapid deleveraging, mainly because of erosion in their debt servicing capacity resulting from disruptions in the functioning of payment flows, which will magnify financial instability. The household sector in advanced economies and the corporate sector in emerging economies are likely to replicate the deleveraging and austerity predicted in the model. The existence of private debt with longer maturities and collateral constraints makes the economy susceptible to financial or economic shocks. If the collateral value exceeds the value of outstanding debt, borrowers can secure additional borrowing through new loans on existing collateral. If the collateral value is lower than the outstanding debt, a negative shock to the economy and a subsequent credit contraction will force the firms into a gradual deleveraging path (Andrés et al. 2020). Private deleveraging depresses economic activity and the natural interest rate while also causing welfare losses throughout the economy (Guerrieri and Lorenzoni 2017; Ivens 2018). During the 2008 global financial crisis, economies underwent a massive deleveraging process, with the deleveraging dynamics being heterogeneous between countries (Martin and Ventura 2016).

Therefore, it is essential to recognise that hotels with high debt-to-equity ratios will be forced to deleverage (McKinsey Global Institute 2012). With the ability to raise cash impaired because of the reduced demand, the industry might witness a distressed selling of assets at discounted rates to meet current creditor obligations. In addition, COVID-19 has also influenced the already dysfunctional capital markets, making it difficult to raise fresh capital through public issues. The story is not much different for private equity firms, who have incurred heavy losses and are reluctant to part with their resources (CARE Ratings 2021; Fowler 2022). In response to the shocks to the highly leveraged economy, the industry might

witness waves of consolidations, with more significant and front-loaded consolidations increasing the risk and duration of deleveraging episodes, hampering the medium-term output losses (Andrés et al. 2020).

Stabilising or bringing down the debt to sustainable levels is a major challenge. Firms can deleverage either by increasing revenues, decreasing expenditure, or additional borrowing. The latter is hardly reassuring as the debt increase must be paid back with interest. The ex-ante business problems, such as financing issues or excessive leverage that had persisted before the pandemic, challenge the resilience of these firms to withstand shocks or changes in the wake of a crisis. The firm's resilience depends on *'a firm's ability to effectively absorb, develop situation-specific responses to, and ultimately engage in transformative activities, to capitalize on disruptive surprises that potentially threaten firms' survival'* (Lengnick-Hall, Beck, and Lengnick-Hall 2011).

The current study examines the change in the capital structure of tourism and hospitality firms over two time periods, the pre-COVID and COVID period, to develop a model for the prediction of deleveraging tendency on the lines of observations by Altman (1968) and Ohlson (1980). To the best of the author's knowledge, this is a novel study in the area of the Indian tourism sector which designs models by identifying the financial variables and ratios that influence the deleveraging potential for a firm. It is an attempt to test that deleveraging factors vary between normal times in comparison to shock periods. It also disregards the presence of forced deleveraging as anticipated by Ray Dalio's debt cycle theory.

Data and Methodology

DATA

In order to examine corporate deleveraging, a firm-level longitudinal approach of three prime tourism sub-sectors, viz. hotels, travel services and airlines, is used in the present study. The relevant data of the firms was collected from CMIE Prowess for an initial sample of 729 firms. After removing firms with critical data missing, the final sample size used is 478 Indian firms.

A dummy variable was created by assigning the value '1' if the debt-to-equity ratio had declined (i.e. deleveraging), and '0' if it had remained relatively constant or increased (i.e. no deleveraging). The dependent variable is categorical and dichotomous. Therefore, the authors used a binary dependent variable model, 'Logit', to analyse and predict the probability of deleveraging based on a set of independent variables. The paper select-

TABLE 1 List of Independent Variables

	Independent variables	Definition	Symbol
1	Debt	The absolute level of debt	DEBT
2	Debt to Equity	The ratio of debt to equity	DTE
3	Debt Service Coverage Ratio	The ratio of net operating income to debt service	DSCR
4	Vulnerability to income shock	The ratio of current assets to total assets	VIS
5	Vulnerability to funding shocks	The ratio of current liability to total liability	VFS
6	Size	Log of total assets	SIZE
7	Liquidity	The ratio of working capital to total assets	LIQ
8	Current ratio (times)	Current assets to current liabilities	CR
9	PBIT	Profit before income and tax	PBIT
10	PBIT to total assets	The ratio of Profit before income and tax to total assets	PBIT_TA
11	Net sales	Gross sales minus returns, allowances, and discounts	NSALES
12	Sales to total assets	The ratio of sales to total assets	SALTA
13	Total assets utilisation ratio	Total revenue to total assets	TAUR
14	Net income for the past two years	Net Income = 1 if the firm had a net loss for the last two years, 0 otherwise	Ti_2
15	Retained earnings to total assets	The ratio of Retained earnings to total assets	RETA
16	Total Debt to total assets	The ratio of total debt to total assets	D_A
17	Operating expenses to total expense	The ratio of Operating expenses to total expense	OPEXTE
18	Tangibility	Tangible net worth	TANG

ed preliminary parameters (variables or ratios) listed in McKinsey Global Institute (2010). Since the literature on deleveraging motivators is scant, the present study used the variables closely related to financial distress or bankruptcy prediction, including current ratio, profitability, size, total asset utilisation, past income and retained earnings (Altman 1968; Ohlson 1980; Shetty and Vincent 2021). Based on the available literature, the independent variables finally selected to run the Logit model are outlined in Table 1.

LOGIT MODEL

The concept of the logit model is based on the cumulative distribution function of a random variable Y, which represents the probability that it takes a value $\leq y_o$ (where y_o is a specified numerical value of Y). Algebraically,

$$F(y) = F(Y = y_0) = P(Y \leq y_0).$$

A typical logit model has a specific exponential functional form, as follows:

$$P_i = \frac{1}{1 + e^{-(\beta_1 + \beta_2 x)}} = \frac{1}{1 + e^{-z}} = \frac{e^z}{1 + e^z}.$$

For a multivariate logit model, the estimated probability of happening of an event (deleveraging in the current case) is

$$P_i = \frac{e^{(\beta_1 + \beta_2 x_2 + \beta_3 x_3 + \ldots + \beta_i x_i)}}{1 + e^{(\beta_1 + \beta_2 x_2 + \beta_3 x_3 + \ldots + \beta_i x_i)}},$$

where the regression function is the nonlinear function of the coefficients. Since the parameter betas are non-linearly related to , the usual OLS procedure cannot be used, which has linearity of parameters as the basic assumptions. The maximum likelihood principle is used for estimating parameters.

Now, represents the probability of a firm deleveraging, whereas (1-) represents the probability of the firm not deleveraging. Thus,

$$\frac{P_i}{1 - P_i} = \frac{1 + e^z}{1 - e^z} = e^z.$$

Here, $P_i / (1 - P_i)$ represents the odds ratio, interpreted as the ratio of the probability that a firm deleverages to the probability that it will not deleverage. Thus, =0.8 indicates that the odds of deleveraging to not deleveraging are 4:1.

Taking the log of the equation,

$$L_i = \ln \frac{P_i}{1 - P_i} = Z_i = \beta_1 + \beta_2 x, \text{ where L is known as the Logit.}$$

In short, Logit is based on a cumulative standard distribution function which produces the probabilities 1 and 0 for logistic distribution.

MODEL ASSUMPTIONS

Certain basic assumptions are to be fulfilled before building the model. These include having the appropriate outcome type, large sample size, no extreme outliers, independence of observations, absence of multicollinearity, and linearity of regressors and log odds.[2]

MODEL BUILDING

The final model was achieved through a stepwise regression involving a series of iterative cycles for identifying the independent variable combination that increases the chances of detecting the observed outcome. The forward selection strategy enters the independent variables till the inclusion of additional variables does not contribute significantly to outcome determination. The statistical significance for the inclusion of variables was initially set at 0.25 and later reduced to 0.10 after manual iterations to ensure the inclusion of significant variables in the model. Two models are used in this analysis to estimate the deleveraging trends pre-pandemic (from 2016) and post-pandemic (from 2019). It enables us to determine what factors were essential to predict deleveraging before and after the pandemic.

POST ESTIMATION

As a post-estimation criterion, a few tests are conducted to test the model's goodness of fit. A popular measure is the Hosmer-Lemeshow goodness of fit, which estimates the model efficiency in representing how well the model fits the data. In addition, the confusion matrix and ROC curve were also used. The former summarises the performance of the classification algorithm with details on true positives, false negatives, false positives and true negatives in the matrix, with

$$\text{accuracy} = \frac{TP + TN}{TP + FP + FN + TN}.$$

The ROC curve plots the sensitivity (true positive) values vs specificity (true negative) between 0 and 1. For any model, there is usually a trade-off between the two. A ROC curve that hugs the upper left corner of the display indicates a model with high sensitivity and specificity. The AUC (area under the curve) indicates how well the model can differentiate between positive and negative outcomes. The higher the AUC, the more accurate the model categorises outcomes.

Results and Discussion

ASSUMPTION TESTING

In the present study, two models were used to evaluate the deleveraging trends in the pre-pandemic (2016–2018) and post-pandemic (2019–2021) period, enabling the authors to identify the factors to predict deleverag-

ing before and after the pandemic. In both the models, the dependent variables *'cdelev6'* and *'cdelev3'* are binary, where 1 represents that deleveraging has taken place, while 0 represents instances where leverage remained either constant or increased. As per the recommendations of Long (1997) and Hair et al. (2010), a minimum of 10 observations for each explanatory variable (with a minimum of 100) represents an adequate sample. The sample in the present study satisfies this requirement, with an initial sample of 478 companies. The independence assumption of the sample is automatically satisfied as there are no repeated measurements, and the data consists of individual firm observations. Variables with a correlation coefficient of 0.8 and higher indicated the presence of multicollinearity and were excluded from the analysis. The usual method of the Box-Tidwell Test is performed to test the linearity, wherein each independent variable's cross-product or interaction term is added to its natural logarithm in the logistic regression model. If the results reveal that the interaction term is significant (p-value <0.05), the linearity assumption is violated (Box and Tidwell 1962). The variables with a p-value < 0.05 can either be removed, dummy coded or transformed into a different scale. Subsequently, Log, square or binary transformation for variables was done. Since the firms included in the sample are from diverse sectors, such as tour operators, restaurants, hotels, and airlines, only highly influential outliers were removed to improve regression results.

DESCRIPTIVE STATISTICS

Table 2 presents the descriptive statistics for the deleveraging variables; cdelev6 represents the deleveraging in the pre-pandemic period while cdelev3 represents deleveraging in the post-pandemic period.

REGRESSION RESULTS

Deleveraging During Normal Times: Model 1

The results of logit regression for deleveraging and post-estimation test results are presented in Table 3. As is evident from the table, the logit model for pre-COVID deleveraging has a Pseudo R^2 of 0.236, which lies within the specified limit of 0.2-0.4 for good model fit, as suggested by McFadden (1973). The Hosmer-Lemeshow test has a Chi^2 of 7.16 with a p-value > 0.05, which suggests a good fit. The model accuracy of 71.79 represents a good fit supported by the ROC curve with an area under the curve of 81.09 percent (Menard 2010; Garson 2014; Hilbe 2015).

TABLE 2: Descriptive statistics for deleveraging variable

	cdelev3		cdelev6	
	Freq.	Per cent	Freq.	Per cent
Firms Not Deleveraging(0)	274	57.32	236	49.37
Firms Deleveraging (1)	204	42.68	242	50.63
Total	478	100	478	100

It is deduced from the results that an increase in debt to equity and high vulnerability to income shocks increases the odds of deleveraging by 1.67 and 1.27, respectively. In contrast, an increase in debt service capability does not affect the deleveraging, with odds ratio =1. However, the firm's current profitability and net income of the past two years are significant, with an odds ratio of 9.60 and 9.42, respectively. On the other hand, the high initial level of debt and liquidity prevents firms from deleveraging. As initial debt rises, the odds of deleveraging decline by 0.15 (i.e. 1-0.85), while an increase in liquidity leads to a decrease in deleveraging odds by 0.11 (i.e.1-0.89).

The estimated logistic Model equation (Model 1) is reproduced below:

$$\begin{aligned} logit(\,cedelev6\,) = {} & 0.115 - 0.16 \log DEBT + 0.51 \log DTE \\ & + 0.004\, DSCR + 0.24 \log VIS + 2.24\, Ti_2 \\ & - 0.11\, CR + 2.26\, PBIT_{TA}. \end{aligned}$$

The results of Model 1 reveal that the debt-to-equity ratio, vulnerability to income shocks, net income, and firm profitability have increased the odds of deleveraging. Intuitively, it is observed that the higher the leverage in the balance sheets, that is, as the debt increases compared to the supporting equity so does the firm's vulnerability (De Fiore and Uhlig 2015). Similarly, it is evident from the logit results that the higher the firm's vulnerability to income shocks, the higher the odds of deleveraging. This is because a constrained revenue stream weakens the ability of the firm to meet creditors' obligations. In either case, the perceived risk of solvency or bankruptcy becomes greater, prompting asset sell-offs, the proceeds of which could be utilised to repay debt, increasing the instances of deleveraging (Sahm 2014). However, firms with adequate debt service coverage ability because of the healthy net income from previous years and/or high level of current profitability are better equipped to pay off their debt obligations. In their case, the asset sell-offs may not necessarily follow, if they intend to go for deleveraging (Zingales 2000).

TABLE 3 Logit Regression and Post-Estimation Test Results of Pre-COVID Period

A. Logistic Regression Results

					Number of obs	475
					LR chi2(7)	155.41
					Prob > chi20	0
Log-likelihood = -251.48971					Pseudo R2	0.236
cdelev6	Coef.	Odds ratio	Std. Err.	z	P>|z|	[95% Conf. Interval]
LDEBT	-0.1591	0.85	0.0499	-3.19	0.001*	-0.2569 -0.0613
LDTE	0.5141	1.67	0.0675	7.61	0.000*	0.3818 0.6464
DSCR	0.0040	1.00	0.0024	1.66	0.098**	-0.0007 0.0088
LVIS	0.2417	1.27	0.0908	2.66	0.008*	0.0638 0.4196
Ti_2	2.2426	9.42	0.2916	7.69	0.000*	1.6712 2.8141
CR	-0.1132	0.89	0.0654	-1.73	0.084**	-0.2414 0.0150
PBIT_TA	2.2615	9.60	1.1664	1.94	0.053**	-0.0246 4.5476
_cons	0.1157	1.12	0.3890	0.30	0.766	-0.6467 0.8781

B. Post-Estimation Test Results:

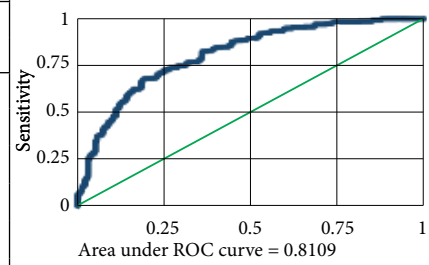
a. Hosmer-Lemeshow goodness of fit

Hosmer-Lemeshow chi2(8)	7.16
Prob > chi2	0.5192

b. Classification matrix

Classified	D	~D	Total
+	185	78	263
-	56	156	212
Total	241	234	475
Correctly classified			71.79%

c. ROC curve



NOTES: LDEBT is the log of the DEBT, LDTE is log of DTE, LVIS is log of the variable Vulnerability to income shocks. * significant at 5% level of significance, ** significant at 10% level of significance

The present study reveals that factors that restrict deleveraging include an absolute level of debt and the liquidity ratio, which a debt overhang situation can explain. This debt overhang arises when a firm fails to secure additional loans or roll over its debt amid the reluctance of creditors, supporting the observations of Kalemli-Ozcan, Laeven, and Moreno (2018) and Philippon (2009).At the same time, the higher the liquidity of a firm the lesser the deleveraging intentions because firms will have high debt servicing abilities. On the other hand, low liquidity indicates financial distress, forcing firms to sell off their assets to repay their debt, which will inflate the odds of deleveraging (Banerjee and Ćirjaković 2021; Chauhan 2017).

TABLE 4 Logit Regression and Post-Estimation Test Results of the COVID Period

A. Logistic Regression Results					Number of obs	475
					LR chi2(7)	137.39
					Prob > chi2	0
Log likelihood = -255.80659					Pseudo R2	0.2117
cdelev3	Coef.	Odds ratio	Std. Err.	Z	P>|z|	[95% Conf.	Interval]
LDEBT	-0.4446	0.64	0.1322	-3.36	0.001*	-0.7037	-0.1855
LDTE	0.7958	2.21	0.1193	6.67	0.000*	0.5620	1.0297
VFS	-1.1359	0.32	0.5479	-2.07	0.038*	-2.2098	-0.0620
SQSIZE	0.1197	1.13	0.0572	2.09	0.036*	0.0075	0.2319
PBIT	-0.0005	1.00	0.0003	-1.74	0.082**	-0.0011	0.0001
OPEXTE	0.0097	1.01	0.0054	1.81	0.071**	-0.0008	0.0202
I.D_A	2.6663	14.39	0.3243	8.22	0.000*	2.0308	3.3019
_cons	-0.9605	0.38	0.5654	-1.70	0.089	-2.0686	0.1475

B. Post-estimation test results:

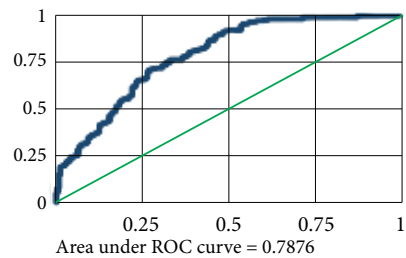
a. Hosmer-Lemeshow goodness of fit

Hosmer-Lemeshow chi2(8)	10.69
Prob > chi2	0.22

b. Classification matrix

Classified	D	~D	Total
+	139	72	211
-	65	199	264
Total	204	271	475
Correctly classified			71.16%

c. ROC curve



NOTES: LDEBT is the log of the DEBT, SQSIZE represents the square of the SIZE, I.D_A is used to represent the categorical nature of the variable D_A. * significant at a 5% level of significance, ** significant at a 10% level of significance

Deleveraging in the Event of Shock (COVID-19): Model 2

The logit regression results performed on data during the COVID-19 pandemic are presented in Table 4.

The logit model for deleveraging during the COVID-19 period has a Pseudo R^2 of 0.2117, which lies within the specified limit of 0.2-0.4 for a good model fit as suggested by McFadden (1973). The post-estimation test results of the Hosmer-Lemeshow Test have witnessed a Chi^2 Value of 10.89 with a p-value > 0.05, indicating a good fit. The model has an accuracy of 71.16% and an area under the curve of 78.76 percent, both suggesting that the model is a good fit.

In the post-COVID-19 deleveraging scenario, the leverage ratios, namely debt to equity ratio and debt to assets, play a crucial role. Any increase in debt to equity increases the odds of a firm deleveraging by 2.21. The debt-to-asset ratio is highly significant for deleveraging during a crisis, with an odds ratio of nearly 14. It is also observed that larger-size firms have higher odds of deleveraging (odds ratio = 1.13). Similarly, firms with a high ratio of operating expenses to total expenses have a higher impact on the deleveraging odds.

Furthermore, higher initial levels and vulnerability to funding shocks during the crisis decrease the odds of deleveraging by 0.36 (i.e.1-0.64) and 0.68 (i.e.1-0.32), respectively. The profitability has weak coefficients and an odds ratio close to 1 despite being significant, indicating that changes to profitability have little or no impact on the odds of deleveraging firms. The Logit regression model (Model 2) of deleveraging during the post-COVID-19 period takes the following shape.

$$\begin{aligned} logit(\, cedelev3\,) = {} & -0.96 - 0.44 \log DEBT + 0.79 \log DTE \\ & - 1.14\, VFS + 0.12\, SIZESQ - 0.0005\, PBIT \\ & + .01\, OPEXTE + 2.27\, D\_A \end{aligned}$$

Higher initial debt levels together with higher vulnerability to funding shocks affect the odds of deleveraging negatively. The firms facing such a situation are caught up in a debt overhang situation, which may threaten the adjustment process during shocks. Due to the loss of revenues during the COVID-19 pandemic, many firms depended on additional short-term debt to fund their operating activities and meet their liquidity requirements. However, firms with a high prior debt build-up may find it difficult to raise new debt, making debt rollovers and consequent deleveraging nearly impossible, corroborating the results of Kalemli-Ozcan, Laeven, and Moreno (2018). Furthermore, the results show that firms with high short-term debt (Vulnerability to Funding Shocks) have higher rollover risk as lenders are reluctant to renew expiring credit lines given deteriorating financial conditions, similar to observations of Diamond and He (2014).

In contrast, firms with high leverage ratios (debt to equity and debt to assets) have higher odds of deleveraging. The same can be explained on account of considerable debt service obligation, which forces the firms to liquidate tangible assets as revenue generation remains weak and the credit market is constrained (Carletti et al. 2020; Goretti and Souto 2013). The

debt-to-assets ratio is particularly concerning as a crisis often results in a fall in the asset's fundamental value, which deteriorates the debt capacity of the assets amid a market freeze (Acharya, Gale, and Yorulmazer 2011). Since larger firms have higher access to credit and secure suitable grants from the government, the shock impact is less damaging for such firms, allowing them to deleverage. The asset sell-off by larger firms, though leading to deleveraging, prevents them from bankruptcy. On the other hand, smaller firms with high short-term debt and weaker access to credit are more likely to be liquidated rather than restructured in a crisis (Mitton 2008).

In comparison, the debt and debt-to-equity ratios similarly affect pre -and post-crisis models. At the same time, firms in the pre-COVID era were more susceptible to income shocks as compared to the post-COVID era, where funding shocks were more significant. During the COVID era, the debt-to-asset ratio and size also played a role in determining the deleveraging odds. It is argued that the higher the obligations of the firm, whether due to higher debt levels, high debt service, high operating expenses, or other short-term liabilities, the higher the odds of deleveraging. Profitability, liquidity and debt serviceability have been identified as crucial factors in the pre-COVID era, but the same is not valid during the pandemic. It may be due to the pressures of the COVID-19 shock; the subsequent safety nets by the government prevented the vulnerabilities created due to high debt service and income shock from forcing firms into deleveraging. The primary observation of the study is that a larger number of firms were deleveraging before the pandemic. Despite the downward pressures of the COVID-19 shock, very few firms continued on this path. Thus, as hypothesised in the literature, forced deleveraging had not been evident among Indian firms. As opposed to deleveraging, firms have used the accommodative monetary policy and unprecedented support to increase their leverage rather than decrease it.

Conclusion

The capital structure of hospitality organisations consists of more debt content and is more vulnerable, especially during any economic shock. The main reason for such a state of affairs is the instability of cash inflows and their dwindling ability to service the debt. In such a situation, researchers believe that firms tend to attempt deleveraging to do away with the fixed interest outflow on the debt capital. However, there are such variables that may influence their deleveraging

intention. Against this backdrop, the present study was undertaken, and it is concluded that the influence of financial indicators on deleveraging may be different in terms of direction and intensity in the event of a shock compared to regular times. During normal times, a high debt-to-equity ratio, high debt service coverage ratio, high current-to-total assets ratio, hefty retained earnings, and high profitability motivate the firms to deleverage as opposed to the crisis period. It is mainly because firms during crisis periods concentrate on meeting operating expenses and try to maintain sufficient liquidity rather than bring down debt levels.

Moreover, the absence of forced deleveraging during the initial three-year period following COVID-19 does not necessarily indicate the sector's stability. Finding a sustainable solution depends on the economy's behaviour during the coming months. The fire sale of assets is a major challenge for the sector. The excessive leverage that amplifies the downturn may result in fire sales of assets as repricing of assets during the crisis period is unfolding sharply due to disruption of economic activity and inflation in uncertainty. Asset fire sales may ensue to meet the funding withdrawal requests by investors in a pessimistic market with financial intermediaries liquidating their holdings (International Monetary Fund 2020). Unfortunately, the reality is that the worth of many hotels is less than the debt, and the lender has already lost money on the note. In the event of a lack of support from the government and lenders, the hotels will face two alternative solutions to pare the effects of this debt shock. One is deleveraging by asset sell-off, and the other is more extreme – filing for bankruptcy. Furthermore, despite the downward pressures of the COVID-19 shock, very few firms have used a deleveraging path. The study's results reveal that forced deleveraging was not evident among Indian firms. The firms have used the accommodative monetary policy and unprecedented support to increase their leverage rather than decrease it.

Due to the presence of high leverage, it is crucial to ensure organisations in the travel and hospitality sector do not turn into non-performing entities, forcing them to foreclose, which may have adverse effects for all stakeholders. The impact on the indebted party is that its future borrowing ability is constrained, and the banking sector will also be stressed because of the accumulation of non-performing advances. It may lead to an economic crisis if the non-performing advances in the banking sector cross 10 percent of the gross advances of the whole banking industry.

In the event of fiscal consolidation in the economy, the existing deleveraging pressures in these firms, though necessary, may be a source of concern for the economy as a whole.

The Indian hospitality sector has been resilient in the wake of the pandemic, being able to sustain its debt obligations and diversify its operations in the challenging times. Despite this, the sector may face financial distress in view of high inflation and rising interest rates. Thus, government and policymakers must earmark a separate fund provided at lower interest rates or direct financial aid or debt moratoriums to this sector which has not received adequate support from the government's stimulus package.

In the long run, tourism firms must ensure higher provisions for uncertainties to make up for the loss of demand. A lower debt-to-equity and debt-to-assets ratio will offer greater stability to the firms and must be prioritised. In the short run, the cash flows must also be managed such that less important purchases are delayed and retained profits used to support a possible shortfall in revenues. Thus, businesses must adopt robust liquidity management practices.

Notes

1 Zombie firms are highly indebted unproductive firms that face being unable to cover debt servicing costs from current profits. As per Banerjee and Hofmann (2020), a zombie firm is one with an interest coverage ratio of less than one over three consecutive years.

2 For more information read Schreiber-Gregory and Bader (2018), and Stoltzfus (2011).

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