Thomas Cook(ed): using Altman's *z*-score analysis to examine predictors of financial bankruptcy in tourism and hospitality businesses

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Abstract

Purpose – Financial bankruptcy is inevitable in the tourism and hospitality ecosystem. Despite the pertinence of tourism and hospitality businesses going into bankruptcy, limited studies have investigated the early warning signs and likelihood of a financial bankruptcy occurring in tourism and hospitality firms. This study examined the predictive value of financial ratios as potential indicators in predicting bankruptcy among tourism and hospitality firms.

Design/methodology/approach – Altman's *z*-score bankruptcy prediction model was applied through five key financial ratios to predict bankruptcy of the Thomas Cook Travel Group over a ten year period (2008–2018).

Findings – The key findings of this study strongly suggest that besides the size and location of the firm, financial ratios are reliable predictors and play a pivotal role in predicting the bankruptcy of a tourism and hospitality business.

Practical implications – The paper provides key stakeholders to adopt checks and balances to identify financial distressed tourism firms through financial ratios.

Originality/value – This is the first academic paper to inspect the financial history of Thomas Cook Travel Group in a financial ratio context, particularly following the bankruptcy of the firm in 2019.

Keywords Financial bankruptcy, Tourism, Financial ratios, Altman's *z*-score, Thomas Cook

Paper type Research paper

Introduction

Financial bankruptcy is a major financial decision that affects the economy and key stakeholders such as shareholders, employees, suppliers, customers and government agencies (Ersan *et al.*, 2019; Wu, 2010). Therefore, predicting bankruptcy has significant implications for the firm and its key stakeholders. Although bankruptcy prediction models have been widely used in the finance literature, there is a paucity of bankruptcy studies in hospitality and tourism (Gemer *et al.*, 2016).

At this juncture, it is important to highlight that bankruptcy is a common risk in all sectors and is not unique to the tourism and hospitality industry. The emphasis is the size of the bankruptcy and lessons learnt to pre-empt the eventualities. A closure of a bed-and-breakfast operator does not equate to a cascading effect of a failed international conglomerate. Therefore, using an example of a multinational corporation, Thomas Cook, in this study will allow robust insights and learnings for other tourism firms to anticipate financial distress, which should prompt protective actions by the supplier firms such as hotels. The cascading effect of a tourism company in financial distress is likely to trickle through the supply chain from delaying payments to suppliers if possible, thus putting the suppliers under financial pressure. This effect is compounded if the company is a large international conglomerate, which has hundreds or thousands of suppliers and many millions of customers such as in the Thomas Cook case. From a customers' perspective, certain vulnerable segments may be more

affected by the logistical displacement and constraints such as disabled (Tao *et al.*, 2019) and senior travellers (Wen *et al.*, 2020a, b).

A review of the hospitality and tourism literature revealed several gaps in the existing literature that motivated us to examine bankruptcy of a global tourism company, Thomas Cook. First, there is a lack of financial ratios used in predicting the bankruptcy of tourism and hospitality firms. Most studies (see, Gemar *et al.*, 2016; German *et al.*, 2019, among others) find size and location to be essential in predicting the bankruptcy of hotels. A large firm enjoys economic of scale in its operation. This saving is passed on to the consumer in a form of lower prices thus making the products or services more competitive. Location, on the other hand, is vital to a firm's success as demonstrated in many studies, such as by Chen *et al.* (2020). In their study, they highlighted the importance of location for Chinese firms to get governmental preferential including subsidies and tax advantages.

Second, more justification is to be provided regarding the rationale for choosing variables as independent variables in the bankruptcy prediction models (Alaka *et al.*, 2018). This is particularly important as the variable selection can potentially have a profound effect on the predictive capacity of the final prediction model. For example, in a regression analysis, the coefficient of determination (R^2) is always indicative of predictive capacity of a statistical model. However, R^2 can be *"improved"* by adding more variables into the regression model even when the additional variable(s) does not contribute to the overall performance of the model (Mat Roni *et al.*, 2020).

Third, bankruptcy studies in hospitality and tourism have called for long time-series data to be used in bankruptcy prediction models for higher accuracy (Youn and Gu, 2010). Time-series data allow repeated observations of entities over a specific period. This provides the dataset with unique characteristics that make it stronger for statistical analysis over its cross-sectional counterpart. While our studies do not endeavour into a sophisticated econometrics data modelling approach, the use of the time series to identify patterns and changes over time provides adequate narratives for the descriptive nature of the Thomas Cook case.

Specifically, this research paper investigates the collapse of Thomas Cook, a nearly 200-year old tour operator in the United Kingdom that apparently went bankrupt with no clear early warnings of an imminent demise. This resulted in an estimated 600,000 travellers left stranded across the globe, which resulted in the most massive peace-time repatriation by the British government to bring back affected British travellers stranded overseas (Duffy and McLean, 2019). As in many high-profile corporate collapses, the pivotal question is, was there any early sign of an impending collapse? Our research answers this question by utilising five key financial ratios (earnings before interest and tax [EBIT] over total assets; net revenue over total assets; market capitalisation over total liabilities; working capital over total assets and retained earnings over total assets) covering a sample period of 2008–2018. Using an established bankruptcy prediction model, Altman's *z*-score, our study finds that the five financial ratios are able to capture well and predict the bankruptcy during the earlier years of business operations. Our results reveal that the company failed to exhibit healthy financial figures and experienced financial distress for the period 2008 to 2018 with a *z*-score of <1.8. This low value of *z*-score means the company faced a high risk of bankruptcy in the future, which ultimately led to Thomas Cook going bankrupt in 2019.

This study makes an important contribution to the existing literature. Among the limited studies on the bankruptcy of tourism and hospitality firms, Gemar *et al.* (2016) documented that the survival of hotels depends on size, location and business cycle but it does not depend on the financial structure of the company. While our findings are consistent with this study in saying that size measured by market capitalisation plays an important role in predicting bankruptcy, the survival of a firm does not depend on financial structure. Our findings reveal that financial ratios play a key role in predicting financial bankruptcy.

Literature review

Defining bankruptcy

The effects of bankruptcy risk lead to business failure, which can be devastating to the economy and key stakeholders. Hence, it is important to utilise bankruptcy prediction models as an early warning system to evaluate more accurately if a company will be under financial distress (Gemar *et al.*, 2019). The literature on defining bankruptcy can be categorised into three groups. The first way to determine bankruptcy is through the single-period model. This is based on companies that last for two accounting periods where securities are traded in the first period and liquidated in the second period. In this framework, companies are declared bankrupt if the amount owed to creditors is more than the liquidation value (Scott, 1981). In this model, only share prices are included, whereas the cash flows of a company are not considered in the equation.

The second method of bankruptcy declaration is when the working capital of companies is negative using Gambler's ruin models. These models assume that variations in firms' capital are random. Any positive changes in capital result from cash flows from companies' operations, and any losses require companies to liquidate assets. This method assumes companies finance their losses through selling assets and do not have access to financial markets (Wilcox, 1971). The third way of determining bankruptcy is by using models with perfect access to external capital. In this model, companies have access to external financial capital and do not have to sell assets to manage their losses. Firms can continue to operate indefinitely through the sale of debt or equity and are deemed solvent if their market value is still positive (Scott, 1981). These theories have been used to further develop empirical models to predict company bankruptcy.

In relation to tourism and hospitality research, Gu (2002) defined bankruptcy as *"a condition in which the firm has negative net worth as well as illiquidity and is in the legal process of reorganization or dissolving"*. Gu (2002) documented a substantial number of restaurant firms and casino firms in the United States that go bankrupt yearly due to severe competition and rapid expansion within the industry. Besides, the uncertainty in the hospitality sector has seen a significant increase recently due to the recessions, terrorist attacks, illnesses and safety concerns (Chan and Lam, 2013) such as the financial crisis, 9/11 attack, severe acute respiratory syndrome (SARS) and coronavirus disease 2019 (COVID-19) pandemics. These factors increase the probability of tourism and hospitality firms going bankrupt. Lee and Choi (2013) and Barreda *et al.* (2017) highlight that bankruptcy does not happen overnight, and it is, therefore, vital to identify the major factors driving bankruptcy and use them to forecast bankruptcy.

Empirical bankruptcy prediction models used in hospitality and tourism

The bankruptcy prediction research domain is constantly evolving with new predictive models using various tools to understand bankruptcy in firms. Most bankruptcy studies adopt a multivariate discriminant analysis, logistic regression, artificial neural network and support vector machine models (Kim, 2011). These models relied on the sole dependence on univariate regression models are insufficient, given the complex and multiple factors that determine bankruptcy (Gemar *et al.*, 2019).

Among the paucity of studies investigating bankruptcy of tourism and hospitality companies, scholars have predominantly applied bankruptcy models to understand bankruptcy in hotels (Gemar *et al.*, 2016, 2019; Lado-Sestayo *et al.*, 2016; Chen and Yeh, 2012; Kim, 2011; Youn and Gu, 2010). These studies tend to use multivariate analysis methods such as regression equations to test the identified business failure factors/ratios as independent variables to predict financial bankruptcy (Gemar *et al.*, 2019). For example, Gemar *et al.* (2016) conducted a survival regression analysis of 1,033 hotels in Spain and found

the business failure of hotels were dependent on their size, location, management and the business cycle. Similarly, Lado-Sestayo et al. (2016) found location of hotel businesses to be a major determinant of business survival. In a recent study, German et al. (2019) identified four key predictors (size, location, good management practices and business cycle) of hotel bankruptcy. In particular, their research revealed that larger firms have a higher survival rate due to economies of scale of operations.

The implication here is that most studies (such as Gemar et al., 2016; German et al., 2019) find size and location to be essential in predicting the bankruptcy of hotels. There is a lack of studies that use financial ratios in predicting the bankruptcy of tourism and hospitality firms. Also, the bankruptcy studies in hospitality and tourism have called for long time-series data to be used in bankruptcy prediction models for higher accuracy (Youn and Gu, 2010).

Empirical methodology, data and results
Multivariate discriminant analysis
Multivariate analysis is one of the most established and frequently used methods to predict business bankruptcy (Kim, 2011) with high predictive accuracy and reliability (Aziz and Dar, 2006). Multivariate discriminant analysis is a statistical technique used to classify an observation into one of more than two priori groups (Alaka et al., 2018). One of the most established bankruptcy prediction models under the multivariate analysis umbrella is Altman's z-score model that has an accuracy rate between 75 and 90% (Altman et al., 2017). It is important to note that there are other market based ratios such as the proprietary Thomson-Reuters StarMine credit risk model and other sophisticated artificial intelligent based models such deep machine learning (Dastile et al., 2020), artificial neural network (Altman et al., 1994; Shi and Li, 2019) and linear/quadratic approach (Altman et al., 1977). However, as recommended by Taffler (1982), even though other bankruptcy prediction models may well be truly predictive in a statistical sense, the Altman's z-score model is arguably the best in an operational context as a means to identify financial distress since the actual bankruptcy is stochastically determined by actions of the firm's bankers, creditors and others.

The advantage of Altman's z-score model is the easy access to the data source with the use of five key financial ratios (1. Working capital/Total assets; 2. Retained earnings/Total assets; 3. Earnings before interest and taxes/Total assets; 4. Market capitalisation/Book value of total liabilities and 5. Net revenue/Total assets) to detect corporate failure. These five key financial ratios (Altman, 1968) were selected as past studies have reported them to possess higher reliability score of 75–90% (Altman et al., 2017) as compared to other combinations of financial ratios, although not optimally (Altman, 1968). These financial ratios are also widely adopted by industry practitioners (Altman, 1968). The regression equation for predicting financial bankruptcy using Altman's z-score is as follows.

$$z = 3.3\frac{EBIT}{Total\ assets} + 0.999\frac{Net\ revenue}{Total\ assets} + 0.6\frac{Market\ capitalisation}{Total\ liabilities}$$
$$+ 1.2\frac{Working\ capital}{Total\ assets} + 1.4\frac{Retained\ earnings}{Total\ assets} \tag{1}$$

where

EBIT = Earning before interest and tax. EBIT is the profit that a company makes but before charging any interest and tax. This profit value provides better basis for comparison of companies by isolating varying interest and tax rates across different periods and jurisdictions.

Net revenue = Net revenue is defined as the net sales a company generates while working capital is calculated by taking current assets minus current liabilities.

Market capitalisation = Also known as Market Cap. It is the market value of the company's equity computed as the product of share price and the number of outstanding shares. This represents the size of the company. The market value contains information concerning the company as the investors react to news and transmit potential impacts through the movement in the share price.

Working capital = Working capital is the total current assets minus total current liabilities. A positive working capital indicates the company's ability to meet its immediate liabilities.

Retained earning = Retained earnings is the profit that is kept as a reserve. Positive retained earnings indicate the company's future growth capacity.

z = Overall index.

Earnings before interest and taxes/total assets
This ratio measures the true productivity of the firm's assets, independent of any tax or leverage factors. Since a firm's ultimate existence is based on the earning power of its assets, this ratio appears to be particularly appropriate for studies dealing with corporate failure. This is closely related to the Thomas Cook business failure where insolvency occurred when their total liabilities exceeded a fair valuation of the firm's assets with a value determined by the earning power of their assets.

Working capital/total assets
Working capital is the difference between current assets and current liabilities. The working capital/total assets ratio is a measure of net liquid assets relative to total capitalisation. Both liquidity and size characteristics are explicitly considered. Ordinarily, a firm experiencing consistent operating losses will have shrinking current assets in relation to total assets.

Retained earnings/total assets
Retained earnings consist of the total amount of reinvested earnings and/or losses over a firm's entire life. A key influencer of this ratio is the age of the firm. For example, an established mature firm such as Thomas Cook Travel will probably show a high retained earnings/total assets ratio because it had time to build up its cumulative profits. Therefore, it may be argued that younger firms are somewhat discriminated against in this analysis, and its chance of being classified as bankrupt is relatively higher than that of another older firm, ceteris paribus. This has been reported by past studies that approximately 50% of bankrupted firms occurred within the first five years of their business cycle (Altman, 1968).

Market value of equity/book value of total liabilities
Equity is measured by the combined market value of all preferred and common stock, while liabilities include both current and long term. The measure shows how much the firm's assets can decline in value (measured by the market value of equity plus debt) before the liabilities exceed the assets and the firm becomes insolvent. For example, a company with a market value of its equity of $10,000 and a debt of $5000 could experience a two-thirds drop in asset value before insolvency. However, the same firm with $2500 equity will be insolvent if assets drop only one-third in value.

Sales/total assets
The capital-turnover ratio is a standard financial ratio illustrating the sales generating ability of the firm's assets. It measures the management's capacity in dealing with competitive conditions. This final ratio is important given it is the least significant ratio on an individual basis. Due to its unique relationship to other variables in the bankruptcy prediction model, the sales/total assets ratio ranks second in its contribution to the overall discriminating ability of the model.

Sample profile
Our study adopted an actual business entity that has been declared bankrupt as our sample case. This sample selection technique is more accurate as compared to past studies that would carefully filter and select bankrupted companies based on a set of bankruptcy conditions such as debt default, liquidation reports and cessation of business (Kim, 2011). Our study selected Thomas Cook Travel Group (founded in 1841) as our sample based on their bankruptcy declaration status in September 2019 after it failed to secure emergency funding of $200m from the UK government (Hancock, 2019).

The background for the collapse of Thomas Cook is partly due to a wave of mergers and acquisitions that happened across the tourism and hospitality industry in 1990s in the form of a parallel transformation. Vertical integrations of tour operators in the United Kingdom during this period (Renshaw, 1994) had inadvertently created an oligopoly market structure in the country which companies such as Thomas Cook inorganically grew so large with at its peak served 22.3 million customers and operated in 21 different jurisdictions (Smith *et al.*, 2016). Although the transformation was feared to limit customer choices and systemic price control by the few major players, it was reported that this was not the case. The price of holiday packages remained competitive because the significant players in the market enjoyed the economies of scale (Renshaw, 1994) via the vertical integration, and the savings were passed on to consumers.

On the flip side, a large corporation such as Thomas Cook is also inherently less fluid to respond to fast changing dynamics in the market. This was part of their downfall as service innovativeness is key to customer satisfaction and loyalty in an ever-dynamic changing hospitality and tourism industry (Lemy *et al.*, 2019). This was evident in Thomas Cook UK division where it experienced continued financial distress and excessive bureaucracy that stifled innovations and performance (Smith *et al.*, 2016).

Data and results
The financial ratio data and the share price data used in this study were collected from the Thomson-Reuters Eikon and Datastream database. This study used the annual financial data of Thomas Cook from 2008–2018. Our study also illustrates the market sentiment over the company in Figure 1, which captures the daily share price movement over a five-year period leading to the announcement of the bankruptcy in 2019.

As seen in Figure 1, the share price of Thomas Cook from 1st Jan 2014 to 23rd Sep 2019 indicates a steady sharp decline in share prices from the third quarter of 2018. It is also useful to see the variation in net income, cash flow from operations and the total cash from 2014 to 2018 as indicated in Figure 2. The net cash flow from operations declined from $198m in 2014 to $4m in 2018. The net income after taxes indicates a struggling position of Thomas Cook with a massive drop in total cash to negative $361m in 2018.

In order to determine the financial health of a company, Altman (1968) provides three levels of ratings based on the *z*-score. A company with a *z*-score of less than 1.80 indicates a financial distress and therefore is likely to collapse within a two-year period (see Altman, 1968). A healthy *z*-score is usually more than 2.99, while a score between 1.80 and 2.99 is

Thomas Cook Share Price

Figure 1.
Share price of Thomas
Cook (2014 to
bankruptcy in 2019)

Net Cash Flow from Operations
Net Change in Total Cash
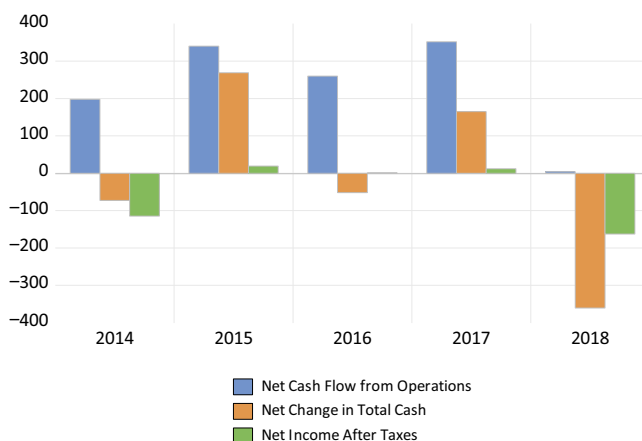Net Income After Taxes

Figure 2.
Changes in cash and
net income (2014–
2018). The data are in
millions of GBP

normally categorised as "undetermined" where the model could not determine the financial health status of a firm. Using the z-score formula, our research calculated the z-score for Thomas Cook using the data downloaded from Thomson-Reuters Eikon. The result is summarised in Table 1.

It is clear from Table 1 that the company experienced sustained financial distress over the observed period. The z-score of Thomas Cook barely reaches the safe level of 2.99 or even the lower end of the undetermined spectrum (i.e. $1.80 < z < 2.99$). Our analysis indicates that there was a warning to the stakeholders of the impending collapse way back in 2008.

Discussion and conclusion

Altman's z-model is a simple bankruptcy prediction model, yet largely accurate, and can be used by individuals who have limited or no in-depth exposure to accounting or finance to assess business continuity of a firm. In this study, our analysis demonstrates the application of Altman's z-score with a ten-year longitudinal data for Thomas Cook to detect financial distress of firms. Our research uses five key financial ratios with respective regression weights assigned to each ratio in our analysis. The model correctly identifies the financial

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
WC/TA	-0.2390	-0.3558	-0.2784	-0.3144	-0.3413	-0.2708	-0.3564	-0.2798	-0.2863	-0.3192	-0.3210
RE/TA	0.2452	0.2132	0.1979	0.1129	0.0178	-0.0264	-0.0608	-0.0374	-0.0569	-0.0509	-0.0624
EBIT/TA	0.0237	0.0183	0.0299	0.0239	-0.0460	-0.0304	-0.0026	0.0038	0.0319	0.0298	0.0267
MCap/TL	0.1685	0.2053	0.1751	0.0390	0.0181	0.2221	0.1690	0.1467	0.0944	0.1702	0.0786
Sales/TA	1.1167	1.5420	1.3734	1.4228	1.5318	1.3415	1.4400	1.2030	1.2856	1.3272	1.4321
z-score	1.35	1.60	1.52	1.30	1.00	1.01	1.02	0.91	1.02	1.07	1.09

Note(s): WC = working capital, TA = total assets, RE = retained earnings, EBIT = earnings before interest and tax, MCap = market capitalisation and TL = total liabilities

Table 1.
Financial ratios and
z-score for Thomas
Cook Group
(2008–2018)

distress of the firm indicating the importance of financial ratios. Our study adds to the existing literature on the bankruptcy in the tourism and hospitality industry such as the work by Gemar *et al.* (2019) and Gemar *et al.* (2016) who highlighted that size, location, competition, management and demand uncertainty as major factors to ensure firms survivability.

In relation to our findings, we find that size plays an important role in determining bankruptcy; however, we do not support the earlier findings that survival rates are not tied to the financial structure of the firm. It is important to note that past studies have also used non-financial ratios to predict bankruptcy and obtained significant results. For example, Lado-Sestayo *et al.* (2016) examined the survival of Spanish hotels and identified location and competition as important factors in determining the survival of firms. The influence of the non-financial factor was also supported by Chen and Yeh (2012) who examined the bankruptcy of Taiwan tourist hotels and found fluctuations in customer demand to cause hotel failure.

Even though our results focused on five key financial ratios, they indirectly capture some of the industry-specific factors that affect the profitability of business such as the location, competition and uncertainty in demand. For example, a good location of the tourist hotel and reduced competition leads to higher profitability and vice versa. This is captured by the financial ratio net revenue. Also, the uncertainty in demand is indirectly captured through net revenue and retained earnings. For instance, firms that face demand uncertainty tend to have reduced or variable net revenue and tend to retain higher earnings for business continuity. It is therefore plausible to say that our findings are largely consistent with Lado-Sestayo *et al.* (2016) and Chen and Yeh (2012) who document that demand uncertainty, competition and location affect the survival of tourist hotels. Our study, therefore, makes an important contribution to the tourism and hospitality literature by showing that one cannot ignore the financial ratios of the company which pivots the survival of the firm.

From a managerial perspective, one of the key benefits of using Altman's z-score is to gain a quick and considerably accurate estimate of financial distress firms which can lead to bankruptcy. This is beneficial for managers in granting trade credits and for market analysts to aid their investment strategy. In the case of Thomas Cook, the prediction model provides managers of supply firms, such as hoteliers and online travel agents (Huang *et al.*, 2019), a quick glance on the financial standings of corporate customers (e.g. Thomas Cook) and on their ability to pay for services rendered. A low z-score should prompt the supply firms to take actions that limit their exposure to default risks such as spreading the risk of non-payment through insurance (see Wang *et al.*, 2018).

The demise of Thomas Cook happened prior to the COVID-19 pandemic. While our findings support the use of Altman's model as a triage in assessing firms financial health, firms with low z-score following the pandemic do not necessarily lead to a bankruptcy although it can potentially be. For example, our research examined three major players [1] in the cruise industry – Royal Caribbean Cruise, Norwegian Cruise Line and Carnival Corp and found that despite their low z-score (0.41–1.52), which was compounded by the fall in revenue of between 73% and 80% for the financial year ending 2020, the investors' and financiers' confidence in the firms' ongoing operations do remain strong. This was evident by additional cash ranging between US$ 6.58 bn and US$18.65 bn secured by the management of these firms. These monies were "*procured*" through loans and issues of new shares in 2020 to keep the businesses afloat. This level of additional cash injection would not have been possible if failures are imminent. What is needed is the company's financial resilience with more prudence financial management and ability to react swiftly to changes in customer dynamics.

As such, it would not be an extraordinary expectation for businesses in tourism and hospitality to morph their business model that suits the changing business landscape when their z-score is showing a declining financial health. An example of such a situation can be found in the Crown Resorts case, a business that operates upscale hotels and casinos in

Australia. Following legal matters (BBC News, 2021), the company took advantage of its brand name by emphasising on strengths of its dominant assets – the hotels. Crown went on an aggressive media campaign projecting their high-quality restaurants at affordable prices on top of hosting entertainment events (Knight, 2020). This strategy presented a value proposition of the company from being seen as a gambler's haven to a warm place for people to socialise, entertain and relax.

Thomas Cook reportedly attributed its pandemonium on changing consumer habits, the rise of online travel agencies and travellers being more informative and computer savvy allowing them to build their own travel itineraries and holiday packages (ABC News, 2019). While these can be the contributing factors operation-wise, they are not the only reasons for their demise. The firm's financial reports showed that debt growth did not correspond to growth in revenue. In the final ten financial years prior to its collapse, Thomas Cook's total debts remained between 76% and 96% of its total assets. In comparison, Voyageurs Du Monde [2], a French travel agent reported the highest for this ratio at 73%. Voyageurs was one of the top performing firms in the industry in the developed European market. Putting more context into this discussion, two Australian travel agents [3] had more conservative ratios, which were below 30%. Although credit is the crux of the economy allowing businesses to grow, excessive debts, however, can place an undue burden on the firm's financials. BBC News (2019) reported that Thomas Cook accumulated GBP1.6 bn of debts over a decade and was estimated with the need to sell three million holidays just to cover the interest payment.

Holding onto a sustained low z-score for an extended period without proper assessment of the causes and without devising appropriate responses to bring the firm back to financial comfort can result in a disastrous outcome. The "*too big to fail*" rhetoric works in some circumstances but not all. Government occasionally intervenes in the economy bailing out private entities. This happens when a failure of a firm or group of firms can lead to a systemic collapse of the nation's economy as seen in the 2009 global financial crisis, where the US Government bailed out banks and insurance companies. Thomas Cook on the other hand, despite its relatively large size, was refused a bail out by the British Government, given the depth of its precarious financial situation (BBC News, 2019).

Limitations and future research

One of the limitations of the study is the model restriction to use other variables such as the management capability, location and seasonality of the business (especially in tourism and hospitality). Our focus purely has been on an established model with a predefined set of key financial ratios in understanding the bankruptcy of a firm. Future research should be conducted to examine the extensive set of variables that include both the combination of financial ratios and industry-specific variables in predicting financial bankruptcy. Future research should also be conducted to examine bankruptcy based on a larger panel data drawn from multiple jurisdictions.

Notes

1. Financial data for these firms were downloaded from the Thomson-Reuters Eikon database for the financial year ended 2020. The data include the income statements, balance sheets and cash flow statements for each firm.

2. The firm is listed by the Thomson-Reuters Eikon (Eikon) database as one of the main players in the industry in the developed European market. Eikon separates the European market into developed and developing markets.

3. We extracted the data from Eikon.

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