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Article

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A Financial Ratio-Based Predicting Model for Hotel Business Failure

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ABSTRACT

The purposes of this study were to find financial ratios that uniquely characterize failed hotel firms, and develop a multiple discriminant model which can predict business failure in the Korean hotel industry. Nine financial ratios that classify 86 hotel firms into failed and non-failed groups were identified. Of these nine ratios, two, including debt ratio and fixed assets turnover ratio, were extracted and their prediction accuracy in terms of hit ratio was 91.9%. The model suggests that debt-burdened firms with low fixed asset turnover ratio are more likely to fail. It means that a prudent debt financing policy is necessary to avoid business failure and fixed assets must be used effectively in order to maintain a viable enterprise. Prediction models for business failure are not homogeneous across all countries. Hotel investors and creditors can benefit from the model in screening out failing firms and lowering their investment risk.

Keywords: Korean hotel industry; Business failure; Multivariate Discriminant Analysis; Z-score.

I. Introduction

A. Problem Statement

Hospitality industry involves high operational and financial risk. According to Ole Skalpe (2003), among the accommodation and restaurant industries the variation in earnings is high and the sales variability is fairly low, whereas the financial leverage and operational leverage are high. Operational leverage measures the flexibility of the firm's operational cost structure. Accommodation and restaurants have high levels of fixed costs (like rent, property tax and interest expense), so the operational

leverage is high in this industry. This industry is also capital intensive and often hotel properties have been financed with loan to value ratios in excess of 80%. These debt obligations require fixed interest charges and regular instalment payments which become quite problematic during recessionary periods. Thus, financial leverage makes the firm more sensitive to changes in the business environment. Using borrowed money can increase the shareholders' return on investment, but high financial leverage also raises the risk of bankruptcy if they are unable to make payment on their debt. They may also be unable to find a new lender in the future. As many hotel owners experienced during the 2008 recession, properties that had been financed with bullet loans which had come due around 2007 and 2008 were suddenly finding there were no lenders interested in refinancing their loans, thereby causing the loans to go into default. Consequently,

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the need for financial risk management and planning is paramount in the hospitality industry due to the capital structure, the vulnerability to business cycles, and the competitive nature of the industry.

Korean firms in the hospitality industry have been facing great challenges in recent years. A recent study reported that more than 70% of hospitality firms fail within the first 5 years of operation (Choi, 2008). A report by National Statistical Office showed that about 124,299 new lodging and restaurant firms, which accounted for 20.88% of the whole industry, were established in 2011, but about 127,443 firms which accounted for 22.07% of the industry went bankrupt or were closed in the same year. The hospitality industry has the most business failures of all businesses in the retail industry (Kim, 2011).

Rapid expansion, accompanied by fierce competition and poor market conditions, have been blamed for a significant number of hospitality firms going out of business (Gu, 2002). The overall market saturation in the hospitality sector has not only led to the dreadful operating performance of individual firms (Park, Choi, & Ahn, 2008) but also intensified the high competition among these firms. The Bank of Korea in 2008 reported that the intensity of service industry competition in Korea is higher than in Japan or the United States. The report found that in Korea, there were 0.9 hotel firms per 1,000 populations compared to 0.5 firms in Japan and 0.2 in the U.S. In addition, the financial performance of firms in this industry has not been good recently. According to the Ministry of Culture, Sports and Tourism (2009), the tourist hotels are experiencing significant difficulties, because of low occupancy rates. The current occupancy rates dropped around 10% compared with 10 years ago. Firms operating in this highly competitive environment are vulnerable to failure especially under poor market conditions. The current credit crisis and the extended slowdown of the nation's economy are likely to make market conditions even tougher in the near future and may lead to more hospitality firms' failure (Youn & Gu, 2010a).

Previous research on bankruptcy has shown that not all firms fail in an unforeseeable manner (Altman, 1984). The problems that lead to the bankruptcy of a business seldom arise overnight. Warning signals preceding failure may emerge much earlier than the actual failure. Therefore, the troublesome signs of a firm can be used to predict the business failure before it actually

occurs (Gu, 2002).

A number of studies have used prediction models to identify warning signs of business failure. Many studies (Platt, 1989; Wight, 1985; Rutledge, 1985) suggest that prediction models for business failure are not homogeneous across all industries, and different prediction models are the result of different characteristics that are unique to a specific industry. Bettinger (1981) suggested that it is necessary to consider that a business failure prediction model should reflect the unique nature of a given industry. Most failure prediction studies have been conducted using U.S. firms and only a handful of studies have developed failure prediction models for Korean business firms (Youn & Gu, 2010a). This study fills the gap by developing an appropriate and reliable business failure prediction model for the Korean hotel industry.

The effective business failure prediction models will be useful to managers, stockholders, investors, creditors and employees. Reliable models for predicting business failures will enable managers to take steps to avoid its occurrence. It will be useful to stockholders by providing them a signal and allowing them to take preventive actions, including portfolio diversification, and shorten the length of time in which losses are incurred. Hospitality investors and creditors could use the model to screen out failing firms and lower their investment risk (Youn & Gu, 2010b). Furthermore, such pre-warning signals will assist in making good career planning decisions. The specific purposes of this study are summarized below.

B. Purpose of the Study

The objectives of this study were as follows:

- (1) To identify financial ratios, representing the financial characteristics of failed hotel firms in contrast with those of non-failed hotel firms.
- (2) To derive a discriminant function to separate the failed hotel firms from the non-failed hotel firms.
- (3) To develop a classification matrix to assess the prediction accuracy of the discriminant model.
- (4) To provide guidance that can be used for strategic decision making in hotel business and provide recommendations to failed hotel firms.

II. Literature Review

A. Business Failure and Bankruptcy

Business failure is the condition in which a firm cannot pay its lenders, preferred stock shareholders and suppliers (Lin, Yeh, & Lee, 2011).

Net income has been widely used to define business failure. Schwartz & Menon (1985) used the reporting of net loss or negative net income as an indication that a firm was having financial difficulty. A firm was considered to have entered the failure process if it had an initial net operating loss following at least three consecutive years of profitability, defined as net income greater than zero. Therefore negative net income is considered by researchers as one of the early warning signs of failure.

Altman (1993) provided three generic terms to represent business failure: 'economic failure,' 'technical insolvency,' and 'bankruptcy'. According to Altman (1993) economic failure means that an asset's return on investment is significantly and continually less than the return on similar investments; whereas technical insolvency refers to a condition in which a firm cannot meet its current obligations, signifying a lack of liquidity. On the other hand, bankruptcy is a more severe condition in which a business enterprise, unable to meet its debt obligations, petitions a court for relief from its obligations and requests either a reorganization of its debts or liquidation of its assets. The three business failure terminologies suggest that a continuum exists in business failure. Most firms may not suddenly face technical insolvency or bankruptcy. Usually they tend to move from economic failure to technical insolvency, and lastly to bankruptcy.

B. Previous Business Failure Prediction Studies

In 1996, Dimitras, Zonakis, and Zopounidis, extensively reviewed a total of 47 published journal articles that developed failure prediction models between 1932 and 1994. Comparing the literature on business failure Dimitras et al. (1996) found that the primary failure prediction methods employed were discriminant analysis and logistic regression analysis.

Beaver (1966) first used profitability, liquidity, and

solvency ratios to predict a firm's failure. Beaver's findings showed that univariate ratio analysis could be useful in predicting business failure. After this, statistical linear models began to be applied to the problem of corporate bankruptcy prediction. Following this, Altman (1968) first developed a multivariate bankruptcy model and tested it empirically. He computed an individual firm's discriminant score using a set of financial and economic ratios. A fairly well-known problem emerged with multiple discriminant analysis, the need to have the variance-covariance matrices of the predictors to be the same for both groups, and to avoid this problem the logistic regression analysis was chosen to predict business failure. Ohlson (1980) introduced the logistic regression with a sigmoid function to the multiple discriminant analysis along with relaxed assumptions for the model. Deakin (1972) developed a prediction model with 14 ratios. He concluded that comparing statistical techniques for failure prediction using financial data as early as three years prior to the event, discriminant analysis could predict business failure best and achieved a high accuracy.

Ravi and Ravi (2007) presented a comprehensive review of the work done, during 1968-2005, in the application of statistical techniques to solve the bankruptcy prediction problem faced by banks and firms. The significant difference between the studies by Dimitras et al. (1996) and Ravi and Ravi was the methodologies used in developing the models for failure prediction. For the model development in the earlier studies, discriminant analysis and logistic regression analysis were the preferred methods. However in the recent studies, artificial intelligence techniques, such as neural networks, seem to dominate more (You & Gu, 2010b).

C. Previous failure prediction studies in hospitality industry

There are some researchers who have investigated industry-specific business failures. For the hospitality industry, there are a few documented business failure prediction studies.

Olsen, Bellas, and Kish (1983) used graph analysis of financial ratios instead of sophisticated models. The drawback of the study is its lack of sophisticated statistical analysis but it is easy to apply. Others have also attempted

to predict bankruptcy using event analysis. Kwansa and Parsa (1991) presented a study of business failure in restaurant companies. Their study identified events in the bankruptcy process that characterized restaurant companies that have filed for bankruptcy under Chapter 11. Although it does not discriminate between failing and non-failing firms with a quantitative model, it compares the two groups based on the characteristics common to failing firms.

Cho's study in 1994 investigated business failure in the hospitality industry and developed logit models for predicting restaurant and hotel failures. Gu (2002) analyzed bankruptcy in the restaurant industry using multiple discriminant analysis (MDA). The limitation associated with the MDA model is the assumption of multivariate normal distribution of independent variables. Kim and Gu (2006a) developed logit models for predicting bankruptcy in the hospitality industry. A major contribution of their study was that they attempted to predict firm bankruptcy 2 years in advance. Increasing the prediction time frame provides firm with more time to correct their errors and thereby reduce the risk of ultimate failure. Using the same data set from Gu's (2002) earlier study, Kim and Gu (2006b) developed a logistic regression model for restaurant bankruptcy prediction and compared its predictive ability with that of the MDA. In comparison with Gu's (2002) MDA model, the out-of-sample testing results showed that the two models are equally effective in predicting restaurant bankruptcy.

More recent studies have used the artificial neural network as the method to predict business failure. Youn and Gu (2010b) developed an artificial neural network (ANNs) bankruptcy prediction model for the U.S. restaurant industry and compared its performance with a logistic regression model estimated from the same data set. The findings showed that the logistic model was not inferior to the ANNs model in terms of prediction accuracy.

Researchers also attempted to compare the traditional qualitative method and artificial neural network method. Youn and Gu (2010a) developed logistic regression and artificial neural network (ANN) models to predict business failure for Korean lodging firms.

III. Methodology

A. Research Model and Hypothesis

Altman (1968) first developed a multivariate bankruptcy model and tested it empirically. Using MDA, Altman established his bankruptcy predictive model with five financial ratios from an initial list of 22 variables. Altman et al. (1977) extended Altman's work in 1968 and expanded his original MDA model to include seven ratios. The new model could correctly predict over 70% of the bankrupt firms 5 years in advance.

In order to analyze business failure in the Korean hotel industry, this study used the multiple discriminant model to discriminate the failed hotel firms from non-failed firms.

Discriminant analysis is an appropriate statistical technique, which involves the construction of a classification model based on sample data and the function, which is then used to classify an object into one of several groups. MDA establishes a classification model in which independent variables (financial ratios) are used to discriminate between failed versus non-failed firms (Gu, 2002). The discriminant model is specified as follows:

$$Z = W_1X_1 + W_2X_2 + W_3X_3 + \dots + W_nX_n$$

where

Z = Discriminant score

W_i = Discriminant weight for variable i

X_i = Independent variable i

Based upon the above literature review, the following hypotheses were developed to guide this study:

Hypothesis 1: Certain financial ratios can differentiate between failed hotel firms and non-failed hotel firms.

Hypothesis 2: The MDA discriminant Z-score for Korean hotel firms are significantly different for failed and non-failed firms, thus comparing the Z-score of individual firms with the critical cutting score value can separate the failed group from the non-failed group.

Table 1. Sample hotel firms

Year	Financially failed firms	Total assets	Non-failed firms	Total assets
1999-2001	Kaya Co, Ltd.	7,102,986	Sentro	7,897,484
2007-2008	Kabo Hotel	9,049,640	Juro International	9,526,918
2002-2005	Grand Hotel	8,892,057	Raemian Tourist Development	8,944,865
1999-2000	Hotel Green Villa Cheju	17,119,464	Siheung Tourist Hotel Co., Ltd.	17,123,128
1999-2007	Naksan Development Co., Ltd.	29,031,157	Seoul Garden Co., Ltd.	29,198,652
1999-2000	Hotel NamTaepyung Yang, Ltd.	13,442,337	Samwha Development, Co, Ltd.	12,832,832
2007-2008	Neo Campus 21	10,094,114	Sky-Sea Resort	10,098,610
1999-2001	New Crown Tourist Hotel	11,694,838	YuSong Hot Spring Development	11,817,477
2002-2006	New Prince Hotel	9,561,551	New Regent Hotel	9,274,246
2004-2006	Hotel Amigo	14,718,130	Ocean Valley Co., Ltd.	732,056
1999-2000	Dae Deok Crystal Co., Ltd.	16,326,799	Mibong Co., Ltd.	16,765,068
2001	Duck San Spa Hotel	6,694,407	Tovice Leisure Industry Co., Ltd.	8,547,349
2001-2002	Dong Nam Sea World Tourist Hotel	20,480,355	Nam Young Co., Ltd.	20,415,956
2007-2008	Dong Busan Tourism Hotel	6,363,840	River Ville Inc.	7,832,682
2005	DML	31,468,260	Sunrise Leisure Group Corp.	31,424,887
1999-2001	Midas Hotel Co., Ltd.	18,760,433	Sunshine Co., Ltd.	18,096,804
2005	Muju TL land Co., Ltd.	6,180,091	Sung Dong Leisure Co.	8,742,675
2002-2005	Moonhwa Tourist Hotel	7,562,374	Sejong Wedding.Co.Ltd	9,856,228
2004-2007	Suwon Tourist Hotel	24,919,617	Teachi world Jeju Hotel	24,357,664
2007	Swiss Condominium	6,608,251	IB Hotel Co., Ltd.	8,381,680
2004-2005	S.H Leisure Tourist. Co., Ltd.	7,069,570	You Eal. Co,Ltd.	8,001,740
2007	Airport Condotel Co., Ltd.	6,980,967	Daewoo Songdo Hotel Co., Ltd.	8,004,826
1999-2006	Olympia Suite Co, Ltd.	41,246,654	Hotel Prima	40,198,802
1999-2002	Woo Ju Co., Ltd.	17,714,800	Hotel Kukie	18,315,818
2001-2007	Grace Hotel	11,864,148	Jiri Mountain Spa Land, Co, Ltd	11,751,752
2006-2008	ILYeon Investment	10,446,335	Hotel Park Business	10,287,130
1999-2002	Core Hotel.Co., Ltd.	15,528,960	Yeonjen Development Co., Ltd.	15,612,653
1999-2003	Jung Won Hotel	9,488,511	Royal Kingdom Hotel	9,854,167
2004-2007	ChoSun Tourist Hotel	7,719,082	Shin Wha Tourism Development	8,320,430
1999-2000	Central [is this the right word here, or is it Central?] Heights Development	11,961,712	Sun San Terminae Co., Ltd.	12,520,264
2001-2003	Crown Tourist Hotel	7,320,527	Jooyoung Twenty-One Co., Ltd.	7,353,196
1999-2007	Paradise Hotel Dogo	11,331,325	Hotel Sorak Park	11,235,573
1999-2001	Hotel Honey Croun	6,059,242	Woo Young Development	8,513,337
2007-2008	Hanwori World Resort	83,941,832	YS Investment Corp.	81,564,240
1999-2000	Hotel Songdo Beach	185,431,776	Seoul Lake Side Co., Ltd.	178,428,154
1999-2000	Daeuysaneop. Co., Ltd.	56,420,811	Sejong Investment & Development Corporation	55,574,352
2001-2007	Dawn Beach Co., Ltd.	25,272,432	Paik Nam Tourist Co., Ltd	27,159,867
2006-2007	Seoul Leisure Tourist Hotel	9,343,932	Prado Hotel	9,559,708
1999-2000	Shinsung Resort Co., Ltd.	15,377,326	Hando Tour Co., Ltd.	15,669,970
1999-2002	Shinhan Development Company	19,402,300	Hotel Paragon	19,438,615
1999-2001	JinYang Enterprise Co., Ltd.	14,715,089	Deoku Hot Spring Hotel	15,335,306
1999-2003	Jin Won Tourist Co., Ltd.	10,364,224	Yong Chang Ind. Co., Ltd.	10,512,604
2002-2003	TaeJin Tour Co., Ltd.	8,357,856	Hotel Taegu Co., Ltd.	8,259,930

Source: Korean financial supervisory service database and Korean companies information database.

B. Sample

Depending on Act on External Audit Ltd, when a firm is over a certain size (current assets seven billion won) should receive an audit obligatorily from a CPA (certified public accountant). If a firm that should undergo an external audit does not, it means there is a big problem in management (Huo, 2010).

In this paper, the corporations that formerly underwent external audits, but didn't get an external audit for 3 years, were defined as failed firms. The samples gathered for this study, were gathered from Korean Financial Supervisory Service Database (DART) and Korean Companies Information Database (KOCO info). By searching the lodging category, 86 failed hotel firms' list was abstracted from the Korean companies' information database. Firms with incomplete or unavailable financial information were removed from the list. In order to compare these firms under the same conditions, firms with different fiscal years were eliminated. Firms that were in the positive for last year's net income to net sales ratio were taken away. If the last year's net income to net sales ratio is positive, it's hard to know whether firms failed or not. Firms which did not receive an audit and did not exceed three years were excluded. In this study, only hotel firms that did not get an external audit more than 3 years were defined as failed firms. After excluding firms that did not meet these conditions, 43 failed hotel firms remained.

During an audit from a CPA (certified public accountant), there are financial audit reports including the financial statements of firms. Financial statements of the 43 failed hotel firms were extracted from their financial audit reports found in the Korean Financial Supervisory Service Database and the Korean Companies Information Database. As the established year and failed year are different for every firm, the total years of available financial statements are different. For example, table 1 shows that Paradise Hotel Dogo had available financial data for 9 years, while Duck San Spa Hotel's financial data was only for 1 year. In order to compare them, the average financial data was used in this study.

It has been a common practice in business failure prediction studies to use one-to-one match of failure and non-failure cases (Gu, 2002). Paired sampling can be matched according to industry classification and size measured by either assets or sales. Therefore, this study

also adopted paired sampling to develop the MDA model. Table 1 lists the failed firms paired with their control firms. There are 86 sample firms including 43 failed hotel firms and 43 non-failed firms. To match the failed firms, average assets of each non-failed firm was calculated within the same year period. After this was done, firms with the most similar asset sizes were selected. Forty-three non-failed hotel firms with the similar sizes in terms of assets were selected to comprise the control sample.

After coding the sample data, it was found that the extreme values can heavily influence the statistical analysis. This study, using the Winsorising method cleaned the data. Winsorising or Winsorization is the transformation of statistics by limiting extreme values in the statistical data to reduce the effect of possibly spurious outliers. The distribution of many statistics can be heavily influenced by outliers. A typical strategy is to set all outliers to a specific percentile of the data.

C. Classifying Variables

Predicting business failure is an important management science problem and its goal is to differentiate firms with a high probability of failure in the future from non-failed firms. In other words, the business failure prediction is to build a model to forecast the moment of distress so that the firm's economic agents may make a suitable decision. This information is basically given by financial ratios and additional information (e.g. activity, company, size, etc.) should also be taken into account. In this study, liquidity ratios, stability ratios, profitability ratios, activity ratios and growth ratios were used to predict business failure.

Liquidity ratios can show a firm's ability to meet short-term obligations (Gu, 2002). A company's ability to turn short-term assets into cash to cover debts is of the utmost importance when creditors are seeking payment. Bankruptcy analysts frequently use the liquidity ratios to determine whether a company will be able to continue as going concern. Stability analysis is that in a certain period of time, in order to keep business activities smooth, ensuring that the various assets, liabilities, capital, and balanced financial structure are well-organized is important. Profitability ratios are used to assess a business's ability to generate earnings as compared to its expenses and other relevant costs incurred during

a specific period of time. Unprofitable firms with cumulative losses are likely to end up with negative net worth and eventually head for bankruptcy. Activity ratios measure a firm's ability to convert different accounts within their balance sheets into cash or sales. Activity ratios are used to measure how effectively the company's assets were being used and how quickly the company's assets are actually being used in generating sales. Growth ratios can help to understand the growth potential of companies from the past to the present. Growth ratios can also be used as an indicator for forecasting the future (Choi, 2009).

Previous bankruptcy prediction studies used financial ratios measuring liquidity, stability, profitability, activity and growth as variables for MDA models in the hospitality industry (Kim, 2006). Based on the ratios commonly used in previous studies of business failure prediction, this study selected 17 ratios, representing liquidity, stability, profitability, activity and growth ratios, as candidate variables for estimating an MDA model. This study collected these financial ratios from Korean Financial Supervisory Service Database and Korean Companies' Information Database. The financial data collected for non-failed firms were from the same years as those compiled for failed firms. Table 2 shows the variables to be included in the model.

IV. Results

A. Tests of Hypothesis

Hypothesis 1: Certain financial ratios can differentiate between failed hotel firms and non-failed hotel firms.

This study utilized the Wilcoxon sum rank test to test if there are certain financial ratios that can differentiate failed firms from those of non-failed firms. In general, T-test is an effective method to verify the differences between the two groups. However, when extreme values are included in the dataset, that can decrease the effectiveness of the T-test. On the contrary, a non-parametric test is not affected by extreme values in the dataset, so it provides a more stable test. A basic assumption of T-test is all variables should follow normal distribution, by contrast Wilcoxon test does not require such assumption of normality (Kim, 2005).

The Wilcoxon Sum Rank Test showed that, at the 0.05 significant level, the two groups are distinctly different based on 9 ratios. These are current ratio, quick ratio, debt ratio, ratio of net income to net sales, total ordinary profit rate, normal profit to net worth, return on equity, fixed assets turnover and growth rate of total assets. These ratios are candidates to be included in the discriminant function model.

Table 2. Classifying Variables

Categories	Financial Ratios
Liquidity Ratios	X1: current ratio (current assets/current liabilities) X2: quick ratio (quick assets/current liabilities)
Stability Ratios	X3: debt ratio (total debt/total assets) X4: fixed assets to long-term capital ratio (fixed assets/ long-term capital)
Profitability Ratios	X5: ratio of net income to net sales X6: total ordinary profit rate X7: normal profit to net worth X8: return on equity (net income/shareholder's equity)
Activity Ratios	X9: total asset turnover ratio (total revenue/total assets) X10: inventory turnover ratio (total sales/average inventory) X11: fixed assets turnover ratio (total sales/ average fixed assets) X12: receivables turnover ratio (net credit sales/average accounts receivable)
Growth Ratios	X13: growth rate of total assets X14: growth rate of ordinary income X15: growth rate of net income X16: growth rate of stockholder's equity X17: growth rate of sales

Hypothesis 2: The MDA discriminant Z-score for Korean hotel firms are significantly different for failed and non-failed firms, and thus, comparing the Z-score of individual firms with the critical cutting score value, can separate the failed group from the non-failed group.

A basic assumption of MDA is the multivariate normality of the classifying variables. According to Jackson (1983), in the case of a single discriminator X, the assumption is that the X variable in each group follows normal distribution. With more than one discriminator, the assumption is that the discriminators follow multivariate normal distribution. Shapiro-Wilk test and Kolmogorov-Smirnov test were used to test the normality of the 17 candidate variables. The test failed to reject the null hypothesis, which predicts that variables follow a normal distribution versus the alternative hypothesis that variable distribution is different from a normal distribution. The test results showed that 17 financial ratios, all followed normal distributions and the null hypothesis failed to be rejected at the 0.05 significance level, except total ordinary profit ratio in group 2.

The assumption of equal covariance or dispersion matrices is usually tested by statistical programs. The most common test is Box's M. In this study Box's M significance is 0.000. Between each group for testing the equality of covariance matrices, Box's M statistic is presented. Box's M significant probability is less than 0.05 to 0.000 at 5% significance level. It means the null hypothesis that

though the significance was less than 0.05, the sensitivity of the test to factors other than just covariance differences (e.g. normality of the variables and increasing sample size), make this an acceptable level.

There are two computational methods that can be utilized to derive a discriminant function: the simultaneous method and stepwise method. Simultaneous estimation involves computing the discriminant function so that all of the independent variables are considered concurrently regardless of the discriminating power of each. Step-wise estimation is an alternative to the simultaneous approach; it involves entering the independent variables into the discriminant function one at a time on the basis of their discriminant power (Hair, Black, Babin, & Anderson, 2010).

In this study the SPSS program was used to estimate the MDA model and two procedures (discriminant stepwise procedure and simultaneous procedure) were used for variable selection. This enables the comparison of the two procedures for classification accuracy. In the step-wise procedure, the variables in the discriminant model were entered one by one based on a cut off F value for pre-specified statistical significance level set at the 0.05 level. The discriminant stepwise procedure selected two variables from the 9 candidates for the model which could best discriminate the failed hotel firms from the non-failed hotel firms. The constant and the coefficients of selected variables are presented in Table 3.

Table 3. Canonical discriminant function coefficients (step-wise procedure)

	Function 1
X1 Debt ratio	-0.19
X2 Fixed assets turnover ratio	0.04
(constant)	1.25
$Z_1 = -0.19 X_1 + 0.04 X_2 + 1.25$	
$X_1 = \text{Debt ratio}$	
$X_2 = \text{Fixed assets turnover ratio}$	

equality covariance is rejected. The discriminant analysis itself does not mean anything. But in reality, equality of the covariance matrix does not violate the assumptions extremely, and especially if the sample size is large enough, it does not cause any problems (Choi, 2000). Hair (2010) stated that the significance of the differences in the covariance matrices of the two groups was 0.0320. Even

In the simultaneous procedure, all of the independent variables were considered concurrently, the 9 discriminant variables were used for the model which was better in discriminating the failed hotel firms from the non-failed hotel firms. The constant and the coefficients of selected variables are presented in Table 4.

The model computed Z-score of the sample companies,

Table 4. Canonical discriminant function coefficients (simultaneous procedure)

	Function 1
X1 Current ratio	0.002
X2 Quick ratio	-0.003
X3 Debt ratio	-0.014
X4 Ratio of net income to net sales	-0.002
X5 Return on equity	0.011
X6 Total ordinary profit rate	0.046
X7 Normal profit to net worth	-0.014
X8 Fixed assets turnover ratio	0.041
X9 Growth rate of total assets	-0.009
(Constant)	0.853

$$Z_2 = 0.002X_1 - 0.003X_2 - 0.014X_3 - 0.002X_4 + 0.011X_5 + 0.046X_6 - 0.014X_7 + 0.041X_8 - 0.009X_9 + 0.853$$

X₁=Current ratio, X₂=Quick ratio, X₃=Debt ratio, X₄=Ratio of net income to net sales, X₅=Return on equity, X₆= Total ordinary profit rate, X₇= Normal profit to net worth, X₈= Fixed assets turnover ratio, X₉=Growth rate of total assets

their reclassified group membership, probabilities of being classified as failed, and probabilities of being classified as non-failed, are shown in table 5. In estimating the model, the SPSS program adjusted the dividing point to a cut-off value of zero. Companies with Z-scores above zero were classified into the non-failed group, whereas companies with Z-scores below zero were classified into the failed group. Table 5 shows that with step-wise procedure, companies associated with higher Z-scores had lower probability of being classified into Group 1 (failed group) and companies with higher Z-scores are more likely to be classified into Group 2 (non-failed group). Among the 86 hotel firms in the sample, 7 companies were misclassified. One failed company DML firm was misclassified into the non-failed group and 6 companies Juro International, Mibong Co., Ltd. River Ville Inc., Sunrise Leisure Group Corp, IB Hotel and YS Investment Corp., were misclassified as failed firms. With the simultaneous procedure, among the 86 hotel firms in the sample, only 5 companies were misclassified. One failed company, DML Firm, was misclassified into the non-failed group and 4 companies Juro International, Mibong Co., Ltd., Sunrise Leisure Group Corp., and YS Investment Corp., were misclassified as failed firms.

Table 6 shows the classification results using step-wise estimation and simultaneous estimation. Using the step-wise estimation, there are 2 independent variables (debt ratio, fixed assets turnover ratio) from the 9 candidates for the model which could best discriminate the failed

firms from the non-failed firms, and the accuracy rate was approximately 91.9 percent. While using the simultaneous estimation, 9 independent variables were used to discriminate the failed firms from the non-failed firms. The accuracy rate was 94.2 percent. The classification accuracy using simultaneous estimation was a little higher than step-wise estimation. It means that although debt ratio and fixed assets turnover ratio were the best discriminating variables, more financial information would improve the ability to discriminate between the two groups more accurately.

The predictive accuracy of the discriminant function is measured by the hit ratio, which is obtained from the classification matrix. What is the acceptable level of predictive accuracy for a discriminant function, and what is not considered acceptable? To answer this question, the analyst must first determine the percentage that could be classified by chance without using the discriminant function. Hair et al. (2010) provided a statistical guideline for estimating a chance classification when the sample sizes of the groups are equal, and it is obtained by dividing 1 by the number of groups. The formula is $C=1/\text{number of groups}$. For instance, in a two-group function the chance probability would be 50%, for a three-group function the chance probability would be 33%, and so on (Hair et al., 2010). In this study, the hit ratio is 91.9% and 94.2%, which is bigger than 50%. It shows that the discriminant function is effective and the chance of classifying by chance is low.

Table 5. Model Prediction Results

Company	Model Prediction Results (Step-wise procedure)					Model Prediction Results (Simultaneous procedure)				
	Actual group	Predicted group	Z- score	Prob. group1	Prob. group2	Actual group	Predicted group	Z- score	Prob. group1	Prob. group2
1 Kaya Co., Ltd.	1	1	-1.069	0.918	0.082	1	1	-1.096	0.931	0.069
2 Kabo Hotel	1	1	-0.309	0.668	0.332	1	1	-0.321	0.628	0.318
3 Grand Hotel	1	1	-1.570	0.972	0.028	1	1	-1.921	0.990	0.010
4 Hotel Green Villacheju	1	1	-0.932	0.891	0.109	1	1	-1.493	0.972	0.028
5 Naksan Development	1	1	-1.905	0.987	0.013	1	1	-1.714	0.983	0.017
6 Hotel Nam TaepyungYang,	1	1	-1.339	0.959	0.041	1	1	-1.370	0.963	0.037
7 Neo Campus 21	1	1	-2.403	0.996	0.004	1	1	-3.056	0.999	0.001
8 New Crown Tourist Hotel	1	1	-2.409	0.996	0.004	1	1	-2.774	0.999	0.001
9 New Prince Hotel	1	1	-0.416	0.719	0.281	1	1	-0.300	0.671	0.329
10 Hotel Amigo	1	1	-0.691	0.826	0.174	1	1	-0.869	0.888	0.112
11 Dae Deok Crystal	1	1	-1.813	0.984	0.016	1	1	-1.133	0.937	0.063
12 Duck San Spa Hotel	1	1	-2.431	0.996	0.004	1	1	-2.064	0.993	0.007
13 Dong Nam Sea World Tourist Hotel	1	1	-0.738	0.841	0.159	1	1	-1.092	0.931	0.069
14 Dong Busan Tourism Hotel	1	1	-1.129	0.927	0.073	1	1	-1.624	0.979	0.021
15 DML	1	2*	0.329	0.678	0.322	1	2*	0.186	0.609	0.391
16 Midas Hotel Co., Ltd.	1	1	-0.481	0.748	0.252	1	1	-0.199	0.616	0.384
17 Muju TL land Co., Ltd.	1	1	-0.847	0.871	0.129	1	1	-1.304	0.957	0.043
18 Moonhwa Tourist Hotel	1	1	-0.740	0.842	0.158	1	1	-0.576	0.797	0.203
19 Suwon Tourist Hotel	1	1	-0.319	0.673	0.327	1	1	-0.326	0.685	0.315
20 Swiss Condominium	1	1	-2.439	0.996	0.004	1	1	-2.546	0.998	0.002
21 S.H Leisure Tourist.	1	1	-0.084	0.547	0.453	1	1	-0.154	0.590	0.410
22 Airport Condotel	1	1	-0.584	0.789	0.211	1	1	-0.281	0.661	0.339
23 Olympia Suite	1	1	-0.188	0.605	0.395	1	1	-0.801	0.870	0.130
24 Woo Ju Co.,Ltd.	1	1	-1.794	0.983	0.017	1	1	-1.741	0.984	0.016
25 Grace Hotel	1	1	-0.562	0.780	0.220	1	1	-0.615	0.812	0.188
26ILYeon Investment	1	1	-0.885	0.880	0.120	1	1	-1.122	0.935	0.065
27Core Hotel.Co.,Ltd.	1	1	-1.353	0.955	0.045	1	1	-1.450	0.969	0.031
28 Jung Won Hotel	1	1	-1.632	0.975	0.025	1	1	-1.220	0.948	0.052
29 ChoSun Tourist Hotel	1	1	-0.631	0.806	0.194	1	1	-1.085	0.930	0.070
30 Central Heights Development	1	1	-2.399	0.996	0.004	1	1	-2.679	0.998	0.002
31 Crown Tourist Hotel	1	1	-0.542	0.773	0.227	1	1	-0.317	0.680	0.320
32 Paradise Hotel Dogo	1	1	-1.741	0.981	0.019	1	1	-1.607	0.979	0.021
33 Hotel Honey Croun	1	1	-2.342	0.995	0.005	1	1	-2.712	0.998	0.002
34 Hanwori World Resort	1	1	-1.147	0.930	0.070	1	1	-1.045	0.923	0.077
35 Hotel Songdo Beach	1	1	-1.843	0.985	0.015	1	1	-1.869	0.988	0.012
36 Daceuysaneop.	1	1	-0.877	0.879	0.121	1	1	-1.256	0.952	0.048
37 Dawn Beach Co, Ltd.	1	1	-0.446	0.732	0.268	1	1	-0.606	0.809	0.191
38 Seoul Leisure Tourist Hotel	1	1	-0.522	0.765	0.235	1	1	-0.401	0.722	0.278
39 Shinsung Resort Co., Ltd.	1	1	-1.137	0.929	0.071	1	1	-0.863	0.886	0.114
40 Shinhan Development Company	1	1	-1.158	0.932	0.068	1	1	-1.184	0.944	0.056
41 JinYang Enterprise	1	1	-0.813	0.862	0.138	1	1	-1.063	0.926	0.074
42 Jin Won Tourist	1	1	-1.432	0.962	0.038	1	1	-1.134	0.937	0.063

43 TaeJin Tour Co, Ltd.	1	1	-0.691	0.826	0.174	1	1	-0.363	0.703	0.297
	2	2	0.981	0.901	0.099	2	2	0.738	0.853	0.147
44 Sentro	2	1*	-0.094	0.553	0.447	2	1*	-0.078	0.547	0.453
45 Juro International	2	2	0.402	0.712	0.288	2	2	0.857	0.885	0.115
46 Raemian Tourist Development Co., Ltd	2	2	0.529	0.767	0.233	2	2	1.557	0.976	0.024
47 Siheung Tourist Hotel	2	2	3.519	1.000	0.000	2	2	3.564	1.000	0.000
48 Seoul Garden Co., Ltd.	2	2	0.337	0.681	0.319	2	2	0.462	0.750	0.250
49 Samwha Development	2	2	0.781	0.854	0.146	2	2	0.608	0.810	0.190
50 Sky-Sea Resort	2	2	1.001	0.907	0.093	2	2	1.117	0.935	0.065
51 YuSong Hot Spring Development Co., Ltd.	2	2	0.332	0.679	0.321	2	2	0.402	0.722	0.278
52 New Regent Hotel	2	2	1.092	0.922	0.078	2	2	0.994	0.914	0.086
53 Ocean valley Co.,Ltd.	2	1*	-1.140	0.929	0.071	2	1*	-1.325	0.959	0.041
54 Mibong Co., Ltd.	2	2	2.531	0.997	0.003	2	2	3.294	1.000	0.000
55 Tovice Leisure Industry	2	2	1.205	0.938	0.062	2	2	1.221	0.948	0.052
56 Nam Young Co., Ltd.	2	1*	-0.552	0.777	0.223	2	2	0.160	0.594	0.406
57 River Ville Inc.	2	1*	-0.275	0.651	0.349	2	1*	-0.301	0.672	0.328
58 Sunrise Leisure Group	2	2	0.582	0.788	0.212	2	2	0.725	0.849	0.151
59 Sunshine Co., Ltd.	2	2	0.608	0.798	0.202	2	2	0.794	0.869	0.131
60 Sung Dong Leisure	2	2	0.334	0.680	0.320	2	2	1.109	0.933	0.067
61 Sejong Wedding Co., Ltd.	2	2	3.817	1.000	0.000	2	2	3.297	1.000	0.000
62 Teachi World Jeju Hotel	2	1*	-0.505	0.758	0.242	2	2	0.009	0.505	0.495
63 IB Hotel Co., Ltd.	2	2	1.492	0.967	0.033	2	2	1.686	0.982	0.018
64 You Eal. Co.,Ltd.	2	2	0.329	0.678	0.322	2	2	0.307	0.675	0.325
65 Daewoo Songdo Hotel	2	2	2.114	0.992	0.008	2	2	2.025	0.992	0.008
66 Hotel Prima	2	2	1.012	0.907	0.093	2	2	0.910	0.897	0.103
67 Hotel Kukie	2	2	0.501	0.756	0.244	2	2	0.249	0.644	0.356
68 Jiri Mountain Spa Land	2	2	0.893	0.882	0.118	2	2	0.932	0.902	0.098
69 Hotel Park Business	2	2	2.320	0.995	0.005	2	2	2.296	0.996	0.004
70 Yeonjen Development	2	2	1.031	0.911	0.089	2	2	0.962	0.908	0.092
71 Royal Kingdom Hotel	2	2	0.577	0.786	0.214	2	2	0.385	0.714	0.286
72 Shin Wha Tourism Development	2	2	0.310	0.668	0.332	2	2	0.369	0.706	0.294
73 Sun San Terminae	2	2	1.553	0.971	0.029	2	2	2.007	0.992	0.008
74 Jooyoung Twenty-one	2	2	1.698	0.979	0.021	2	2	1.119	0.935	0.065
75 Hotel Sorak Park	2	2	1.196	0.937	0.063	2	2	1.551	0.976	0.024
76 Woo Young Development	2	1*	-0.548	0.775	0.225	2	1*	-0.778	0.864	0.136
77 YS Investment Corp.	2	2	0.451	0.735	0.265	2	2	0.289	0.665	0.335
78 Seoul Lake Side	2	2	3.797	1.000	0.000	2	2	3.641	1.000	0.000
79 Sejong Investment & Development Co.	2	2	3.578	1.000	0.000	2	2	3.694	1.000	0.000
80 Paik Nam Tourist	2	2	1.486	0.966	0.034	2	2	1.583	0.977	0.023
81 Prado Hotel	2	2	1.088	0.921	0.079	2	2	0.927	0.901	0.099
82 Hando Tour Co., Ltd.	2	2	1.266	0.946	0.054	2	2	1.395	0.965	0.035
83 Hotel Paragon	2	2	2.385	0.995	0.005	2	2	2.313	0.996	0.004
84 Deoku Hot Spring Hotel	2	2	3.565	1.000	0.000	2	2	3.168	0.999	0.001
85 Yongchang Ind.	2	2	0.926	0.890	0.110	2	2	0.927	0.901	0.099
86 Hotel Taegu Co., Ltd.										

Source : Korean financial supervisory service database and Korean companies information database

Note: Group 1= failed firms, Group 2= non-failed firms, Cutting score=0.

B. Discussion of model variables

$$Z_1 = -0.19X_1 + 0.04X_2 + 1.25$$

X_1 = Debt ratio

X_2 = Fixed assets turnover ratio

Debt ratio (total debt/total assets) is a ratio that indicates what proportion of debt a company has relative to its assets. The measure gives an idea to the leverage of the company along with the potential risks faced in terms of debt-load. A debt ratio of greater than 1 indicates that a company has more debt than assets (or their assets are “under water” as happened during the 2008 recession), while a debt ratio of less than 1 indicates that a company has more assets than debt and also shows the percentage of total assets financed by debt. A higher debt ratio will result in a smaller negative Z-score. Because of the negative sign of its coefficient in the model, the higher debt ratio will make the Z-score less positive. Therefore, the negative sign of the debt ratio suggests that higher debt leverage makes the Z-score smaller and increases the probability of being a failed firm. For hotel firms, relying heavily on debt financing results in being burdened with high interest expenses in addition to other short-term liabilities. Such companies are more likely to default on those short-term payments when the debt service is relatively high. This finding suggests that a prudent debt financing policy is necessary to avoid business failure.

Fixed asset turnover ratio is a financial ratio of net sales to fixed assets. The fixed-asset turnover ratio measures a company's ability to generate net sales from fixed-asset investments. A higher fixed-asset turnover ratio shows

that the company has been more effective in using the investment in fixed assets to generate revenues, assuming there was no significant decline in the book value of the fixed assets. In this discriminant function, a higher fixed assets turnover ratio will help achieve a bigger positive Z-score. Due to the positive sign of its coefficient in the model, a higher fixed assets turnover ratio will make the Z-score more positive. So the positive sign of the fixed assets turnover ratio makes the Z-score bigger and reduce the probability of being failed.

In the hotel industry, a high fixed asset turnover ratio means that fixed assets are able to generate revenue effectively for the firm, all things being equal. On the other hand, a low ratio means that fixed assets have not been used effectively to drive revenues. Both fixed assets turnover and total asset turnover are relatively low in most hotels because the hotel industry is a highly capital-intensive industry (Choi, 2009). For the hotel industry, the finding suggests that the fixed assets should be used effectively, and if the fixed assets turnover ratio is too low, the firm should consider seriously the disposal of some of the fixed assets. The two variables retained in the model, debt ratio and fixed assets ratio, were stability ratios and activity ratios respectively. Gu (2002) concluded that the debt ratio (stability/solvency ratio) was the most significant classifying ratio. The model's retention of only two variables from 9 candidates does not mean that the failed group differs from the non-failed group in only two financial ratios. The two groups were still significantly different in 9 ratios. The discriminant step-wise procedure, selected only two variables that could best classify failed firms from non-failed firms. For the purpose of

Table 6. Classification Matrix (Original)

Category	step-wise procedure			simultaneous procedure		
	failed firms	non-failed firms	total	failed firms	non-failed firms	total
failed firms (count)	42	1	43	42	1	43
non-failed firms (count)	6	37	43	4	39	43
failed firms (%)	97.7	2.3	100.0	97.7	2.3	100.0
non-failed firms (%)	14.0	86.0	100.0	9.3	90.7	100.0
hit ratio	100×[(42+37)/86]=91.9%			100×[(42+39)/86]=94.2%		

classification, an MDA model does not need to include all ratios that are different.

$$Z_2 = 0.002X_4 + 0.011X_5 + 0.046X_6 - 0.014X_7 + 0.041X_8 - 0.009X_9 + 0.853$$

X_1 =Current ratio, X_2 =Quick ratio, X_3 =Debt ratio, X_4 =Ratio of net income to net sales, X_5 =Return on equity, X_6 = Total ordinary profit rate, X_7 = Normal profit to net worth, X_8 = Fixed assets turnover ratio, X_9 =Growth rate of total assets

Though the simultaneous procedure, selected 9 variables that could best classify failed and non-failed firms, debt ratio and fixed assets turnover ratio emerged again in the discriminant function by simultaneous procedure. It means that, if financial information is limited, then debt ratio and fixed assets turnover ratio would be the best discriminant variables. If more financial information is available, then the other significant variables would emerge in the discriminant function.

Current ratio and quick ratio are well-known liquidity measures. Liquidity ratios are used to determine a company's ability to pay off its short-term debt obligations. Generally, the higher the value of the ratio, the larger the margin of safety that the company possesses to cover short-term debts. Therefore, they should have a direct impact on the firm's default risk. Ratios of net income to net sales, return on equity, total ordinary profit rate, and normal profit to net worth belong to profitability ratios. Profitability ratios show a firm's ability of covering all costs and providing some returns relative to sales or investments. Therefore, having higher profitability ratios relative to a competitor's ratios indicates that the firm is performing well financially. Unprofitable firms with cumulative losses are likely to end up with negative net worth and eventually head for bankruptcy. Growth rate of total assets is an indicator of firm growth. Growth ratios show the relationship between sales and profit. Increasing the value of total assets without the assets being productive simply is not a good thing. If there are a lot of assets but they do not generate increased revenue efficiently, it signifies nothing. Therefore, the negative sign of the growth rate of total assets suggests that higher growth rate of total assets makes the Z-score smaller and

increases the probability of being failed. In the hotel industry, it is hard to acquire assets only using equity financing. Borrowing money from a bank is an efficient way to acquire assets. But the important thing is to generate revenue efficiently; otherwise high growth rate of total assets, leading to high debt service, may become a heavy burden to a hotel firm, especially in a recessionary economy.

Table 6 suggests that the classification accuracy with simultaneous procedure (94.2%) is a little higher than step-wise procedure (91.9%). It means that when applying the model in reality, although debt ratio and fixed asset turnover ratio could be the best discriminant variables, considering more financial information will help discriminating the two groups more accurately. When more financial data can be collected, the other significant variables, current ratio, quick ratio, ratio of income to net sales, return on equity, total ordinary profit ratio, normal profit to net worth, and growth rate of total assets, could emerge as significant discriminant variables.

The two groups' ratio differences and the inclusion of the stability variables (debt ratio) and activity variables (fixed assets turnover ratio) in the model imply that the fundamental causes of hotel business failure lie in the firms' financing policy and profitability.

V. Conclusion

A. Conclusion & practical implications

The purpose of this study were to find the financial ratios that can distinguish failed hotel firms from non-failed hotel firms, and then develop the discriminant function which can separate the failed firms and non-failed firms. In this study, 43 failed hotel firms and 43 non-failed hotel firms' financial data from 1999 to 2008 were used to establish the discriminant model. Among 17 candidate variables, 9 variables were included to establish the discriminant model. Through stepwise procedure 2 variables from the 9 candidates for the model could best discriminate the failed hotel firms from the non-failed hotel firms. They are Debt ratio and Fixed Asset turnover ratio. The estimated model using these two variables classified the sample firms with a 91.9 percent accuracy using the stepwise procedure, and 94.2 percent accuracy

using then simultaneous procedure.

The hotel industry is a high risk industry, financial risk management is required. Risk management can reduce costs of financial distress and bankruptcy. The “trade off” hypothesis states that firms trade off their operating leverage and financial leverage to manage their level of overall risk. Mandelker & Rhee (1984) examined the “trade off” hypothesis proposed by Van Horne (1977) and concluded that operating and financial leverage can be combined in a number of different ways to obtain a desirable degree of overall leverage and risk of the firm. High operating risk can be offset with low financial risk and vice versa.

The estimated model suggests that in the Korean hotel industry, debt-burdened firms with low fixed asset turnover ratio are more likely to fail. Relying heavily on debt financing and other short-term debt is one of the major reasons for the failure of hotel firms. They are more likely to default on those short-term obligations. The finding suggests that a prudent debt financing policy is necessary to avoid failure. Adopting a low-debt financing policy to lower the debt ratio would help raise the Z-score values in the discriminant model and eventually raise probability of success. Gu (2002) pointed out that good inventory management and tight labor cost control are two major areas on which hotel operators should focus. Additionally, fixed assets must be used effectively in order to get the most out of them, if the fixed assets turnover ratio is too low, the owner should consider the disposal of some of the fixed assets.

The results of this study should be of value to managers, stockholders, investors, creditors and employees. By applying the model, the management of a hotel firm can evaluate its chance of heading for financial failure and take early preventive measures. They can also conduct a financial health test for the firm from time to time by applying the model. Especially for a non-failed hotel firm that has been misclassified by the model as a failed firm; what matters to clients, banks may apply the discriminant model to them periodically as a financial health check by calculating their Z-score values. Once a bankruptcy candidate is identified, the bank should issue a warning and urge the hotel firm to take corrective actions in a timely manner, thus reducing the chance of eventually going bankrupt.

B. Limitations and Further Research

The major limitation of this study is the sample size used in this study, which is relatively small. In Korea, the bankruptcy database is not as open as in the United States. It is difficult to determine clearly which firm is bankrupt. In order to overcome this problem, companies were determined to be failed on the basis of whether the companies received an external audit. Although the failed firms were identified, it is difficult to find historical financial information for failed firms and their financial information is often incomplete. Previous bankruptcy prediction studies encountered the same problem (Gu, 2002; Kim & Gu, 2006b). In order to test if the model can effectively predict failed firm in the hospitality industry, it is necessary to have a holdout sample of failed hospitality firms. Because the sample size in this study is not large enough, validation using a holdout sample of failed firms was not feasible. Future research may extend to include more bankrupt hospitality firms or try different data sources.

The selection of statistical methods and model in varying ways can improve forecasting accuracy. In future studies, other models or comparing the accuracy of MDA with other prediction model can be investigated. There are many new models to predict bankruptcy, such as Logit model, neural network analysis and Intelligent Techniques. But there are not many studies using these models in hospitality industry. Future research using these kinds of models could provide insight into which model yields the most accurate prediction. This is because predicting financial failure of hospitality firms effectively, and taking action as early as possible to prevent failure, are ultimate goals of any good and sustainable business.

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