



University of
Massachusetts
Amherst

Financial Distress for U.S. Lodging Industry: Effects of Leverage, Capital Intensity, and Internationalization

Item Type	pap_emp;event
Authors	Lee, Seoki;Koh, Yoon;Huh, Chang
Download date	2026-06-06 22:39:47
Link to Item	https://hdl.handle.net/20.500.14394/42471

FINANCIAL DISTRESS FOR U.S. LODGING INDUSTRY: EFFECTS OF LEVERAGE, CAPITAL INTENSITY, AND INTERNATIONALIZATION

Seoki Lee
Temple University
Philadelphia, PA, USA

Yoon Koh
Temple University
Philadelphia, PA, USA

Chang Huh
Niagara University
Niagara University, NY, USA

ABSTRACT

Cost implications from financial distress play a significant role in a firm's operation and profitability. Due to the significant importance of financial distress, understanding its determinants has had wide examination in the financial economics literature. This study examines three main determinants of the financial distress: leverage, capital intensity, and internationalization, for publicly traded U.S. lodging firms for the period 1990 to 2008. Findings suggest that leverage increases U.S. lodging firms' financial distress while capital intensity and internationalization reduce distress.

Key words: financial distress; capital intensity, leverage, internationalization, U.S. hotels

INTRODUCTION

Based on the trade-off theory, financial distress has gained consideration as an important determinant of a firm's optimal capital structure (for example, Opler & Titman, 1994). According to Kraus and Litztenberger (1973), the trade-off theory suggests that a firm can capitalize on advantages from increasing its debt level through tax benefits (i.e., interest expense is tax deductible). However, as a firm exceeds the debt level above a certain point, the firm's degree of financial distress begins to increase and costs associated with debt begin to overshadow benefits. Therefore, the firm attempts to maintain its capital structure at a balanced and optimal level to avoid the greater costs of debt compared to the benefits of debt.

Financial distress plays a significant role in a firm's operation and profitability through the influence of cost implications, such as administrative and legal costs associated with the bankruptcy process (i.e., direct financial distress costs) or increased costs of debt (i.e., indirect financial distress costs) (for example, Betker, 1997; Beaver, 1966). Due to the significant importance of the financial distress, understanding its determinants has had wide examination in the financial economics literature. Through the course of the investigation, the literature shows recognition that a firm's leverage is a main factor that negatively impacts the level of financial distress (Opler & Titman, 1994; Andrade & Kaplan, 1998). This relatively widely accepted notion has been challenged in the literature which contends that a firm's leverage positively, not negatively, impacts the degree of financial distress (Jensen, 1989; Ofek, 1993). Such mixed and inconclusive arguments involving leverage calls for further investigations and the current study aims to enrich the literature, especially by providing specific findings with regard to the lodging industry.

In addition to leverage, the literature suggested that capital intensity is another determinant of financial distress through a role that alleviates the degree of distress because higher capital intensity implies a higher degree of fixed assets that could be used as collateral in case a firm experiences a financially distressing condition (Charalambakis, Espenlaub, & Garrett, 2008). However, another group of people argues that capital intensity represents operating leverage and tends to increase a firm's business risk (Brealey and Myers, 1984; Shapiro and Titman, 1986). This is because more fixed costs normally incur to a firm with a high level of fixed assets and such firm tends to show its profitability to fluctuate more than others due to the fact that a high proportion of fixed costs exists regardless of sales level.

Another important factor to consider in the contemporary globalized economy is internationalization. Based on the modern portfolio theory (Markowitz, 1952), lodging companies which increasingly diversify internationally, may reduce their overall business risks and thus decrease the degree of financial distress, as compared to less internationally diversified lodging companies. Internationalization, as a diversification strategy, can reduce business risks by virtue of diversified operations in multiple countries (Lessard, 1973; Levy & Sarnat, 1970). Companies with international operations may reduce volatility in their earnings and such stability may decrease their business risks (Agmon & Lessard, 1977). In the same vein, some literature also argued that internationalization tends to reduce cost of capital (Fatemi, 1984; Singh & Nejadmalayeri, 2004).

Considering the three aforementioned and proposed main determinants influencing the degree of financial distress among U.S. lodging companies, the current study aims to examine whether or not the three proposed determinants (i.e., leverage, capital intensity, and degree of internationalization), in fact, affect the degree of financial distress during the period 1990 to 2008. Study findings suggest that leverage increases the degree of financial distress while the capital intensity and the degree of internationalization reduce financial distress for publicly traded U.S. lodging companies. The findings imply that the widely practiced franchising strategy does not seem to alleviate the degree of financial distress, but rather a traditional attitude that fixed assets as collateral for a financially distressed firm assist reduction of distress, holds for the U.S. lodging industry as well. The study next discusses research methodology, followed by data and findings. Discussions and implications conclude the study.

METHODOLOGY

Model

This study employs a pooled regression analysis using Newey-West heteroscedasticity and autocorrelation, consistent (HAC) standard errors to adjust regression coefficients for possible autocorrelations and heteroscedasticity (Newey & Wes, 1994). The proposed and examined model is:

$$Z_t = \alpha_0 + \alpha_1 LEV_t + \alpha_2 CI_t + \alpha_3 DUMINT_t + \alpha_4 SIZE_t + \alpha_5 PROFIT_t + \alpha_6 Q_t + \alpha_7 LA_t + \alpha_8 UR_t,$$

where Z represents a firm's degree of financial distress, measured by a modified Altman's Z-scores (more detailed definition and information appear following the Variables Section); LEV represents a firm's leverage or capital structure, measured by debt to equity ratio; CI represents capital intensity, measured by a ratio of fixed assets to total assets; DUMINT represents a dummy variable of internationalization, where 1 identifies a firm with international operations, 0 otherwise; SIZE represents a firm's size, measured by the log of revenues; PROFIT represents a firm's profitability, measured by net income (NI) scaled by revenues; Q represents a firm's growth opportunity, measured by Tobin's Q (more detailed definition and information appear following the Variables Section); LA represents a firm's holding of liquid assets, measured by current assets scaled by total assets, and UR is the unemployment rate representing economic conditions.

Variables

First, the dependent variable of this study is the degree of financial distress. The current study estimates distress using a modified Altman's Z-scores (Z) proposed by MacKie-Mason (1990). The modified Z-scores' calculation follows: $3.3 (EBIT/TA) + 1 (Sales/TA) + 1.4 (Retained Earnings/TA) + 1.2 (Working Capital/TA)$,

where EBIT represents a firm's earnings before interest and taxes, and TA represents total assets. Higher Z-scores mean that the firm is less financially distressed. The original Z-score calculation included one more factor in its model: market value of equity divided by book value of total liabilities (Altman, 1968). However, eliminating that factor from the model was later suggested in the literature because the factor contains information about a firm's equity security that often has a systematic relationship with other equity value related measures in the model, such as Tobin's Q (Graham, Lemmon, & Schallheim, 1998). Such a systematic relationship may lead to finding a significant relationship between Z-scores and the value related measures, not because of the existence of a true relationship, but rather due to the common equity value component that systematically relates them.

The current study's model has three main factors. The first is leverage, measured by the debt-to-equity ratio. Although the literature indicated mixed findings for the relationship between leverage and the degree of financial distress, the current study expects a negative relationship between a firm's leverage and Z-scores, an implication based on several previous hospitality studies that found a negative relationship between leverage and firm performance (for example, Lee, 2008). The current study makes the assumption that firm performance has a positive relationship with Z-scores (again, higher Z-scores mean less financially distressed).

The second main factor of the study is capital intensity (CI), measured by total fixed assets scaled by total assets (Charalambakis, et al., 2008). As previously discussed, a possible argument may involve either a positive (i.e., the collateral argument) or negative relationship (i.e., the franchising strategy argument) between CI and Z-scores. Another possibility is that no significant relationship may exist because the two arguments may offset each other's effect. The current study does not support a particular direction.

The third main factor is internationalization, and the current study estimates that aspect by using a dummy variable (DUMINT). The study assigns a value of 1 to DUMINT when a firm has international operations and value of 0 when a firm has no international operations. The study expects a positive relationship between DUMINT and Z-scores based on the modern portfolio theory (Markowitz, 1952) that suggests a more diversified portfolio or operation reduces business risks. The current study assumes a negative relationship between business risks and Z-scores.

This study includes five control variables: a firm's size, profitability, growth opportunity, holding of liquid asset and economic conditions. Firm size (SIZE) controls for a size effect on Z-scores because volatility of a firm's financially distressed condition for a large company may be less than for a small company. Control for profitability is necessary since the expectation is that profitability has a significant, positive impact on Z-scores (i.e., higher profitability leads to a better financial condition, higher Z-scores). Following previous studies, this study uses Tobin's Q (Q) to represent growth opportunity (Min & Prather, 2001). Calculation of the Q follows: $(MVE + PS + DEBT) / TA$, where MVE is the product of a firm's stock price and the number of common shares outstanding; PS represents the liquidating value of outstanding preferred shares; DEBT is the value of short-term liabilities, net of short-term assets plus the book value of long-term assets, and TA represents the book value of total assets. The expectation is for a positive relationship between Q and Z-scores. A firm's holding of liquid asset (LA) is measured by current assets scaled by total assets to represent a firm's liquidity, and the expectation is for a positive relationship between LA and Z-scores. The last control variable is unemployment rate (UR) to represent economic conditions. A high UR can imply recession periods, while a low UR value represents boom periods. Consequently the expectation is for a negative relationship between UR and Z-scores: During good economic periods (low UR values), financial distress conditions should improve (high Z-scores), and vice versa.

DATA

This study collected the required data to examine the proposed model from two sources: 1) Compustat database for annual financial data, and 2) hand collection from annual reports (10Ks). Data from the sampled, publicly traded U.S. hotel companies encompasses the period 1990 to 2008. The dataset omits missing values and

irrelevant companies from the sample. The irrelevant samples represent two issues: 1) non-U.S. based companies, and 2) companies whose main operations are not lodging, but other businesses. Examples of the first category include Home Inns & Hotels Management, a China-based company and Sun Resorts, Ltd. Examples of the second category include: Orient-Express Hotels, Ltd which operates multiple businesses such as deluxe hotels, restaurants, tourist trains, and river/canal cruises; Maui Land & Pineapple Company, Inc. which operates through three segments of agriculture, resort, and community development; Pocono Hotels Corporation which consists of the operation of a vacation resort in Skytop, Pennsylvania, the development and sale of clustered homes and related activities. Finally, the study excluded companies with two or fewer observations because those companies do not present significant continuity in operations and may induce potential extraneous noise in the sample. After data cleaning process, the study retrieved annual observations for 316.

With the 316 observations, the study next performed an outlier check. Based on the cut-off of standardized residuals from a pooled regression analysis of the full model at the 0.01 significance level, the study removed outliers through six iterations. After the six iterations, no further outliers were apparent at the 0.01 significance level, and the final sample, after eliminating outliers, became 291 and constituted the basis for the study's main analysis.

FINDINGS

Descriptive Statistics

The study performed a descriptive analysis, and Table 1 presents the results. Z-scores show a mean value of 0.994 with a range from -7.116 to 3.638. Leverage value ranges from 0.016 to 17.111 with a mean value of 2.47, and capital intensity (measured by fixed assets scaled by total assets) has a mean value of 0.619. About 35% of the total, annual firm observations show international operations. The mean value for revenue is USD1,478 million with a minimum (maximum) of USD 0.1 (USD12,990) million, and net income has a mean value of USD 93.9 million, ranging from about USD -1,072 to USD 2,490 million. Tobin's Q presents a minimum and maximum value of 0.013 and 7.289, respectively, with a mean value of 1.162. A firm's holding of liquid assets (measured by the ratio of current assets to total assets) has a mean value of 0.174 with a minimum (maximum) value of 0.018 (0.911). Last, the unemployment rate (UR) shows a mean value of 5.379%, ranging from 4% to 7.5%.

Table 1
Summary of Descriptive Statistics[†]

Variable	N	Mean	S.D.	Minimum	Maximum
Z	291	0.994	0.859	-7.116	3.638
Leverage	291	2.470	2.654	0.016	17.111
Capital Intensity	291	0.619	0.257	0.014	0.973
DUMINT	291	0.344	0.476	0	1
Revenue (in millions)	291	1,478.59	2,795.96	0.10	12,990.00
Net Income (in millions)	291	93.90	275.42	-1,071.97	2,490.13
Q	291	1.162	0.766	0.013	7.289
Liquid Asset	291	0.174	0.153	0.018	0.911
Unemployment Rate (%)	291	5.379	0.923	4.000	7.500

[†]Z represents a modified Z-score; Capital intensity is measured by fixed assets scaled by total assets; DUMINT represents a dummy variable of internationalization; Q represents Tobin's Q, and Liquid asset is measured by current assets scaled by total assets.

Next, the study conducted a Pearson's correlation analysis to examine for a bivariate relationship among all study variables. Table 2 presents the results of the correlation analysis, and Z-scores shows a significant correlation

with all variables, except a firm's size (SIZE) ($r = 0.04$). Z-scores show a negative relationship with leverage (LEV), capital intensity (CI), Tobin's Q (Q) while showing a positive correlation with internationalization (DUMINT), profitability (PROFIT), liquid assets (LA), and unemployment rate (UR). An interesting result is the negatively significant relationship between Z-scores and CI which is unexpected. However, because this relationship does not account for any other control variables simultaneously, their relationship may appear differently from results of the pooled regression analysis. Among independent variables, no extremely high level of correlation may suggest no severe multicollinearity problem from the main model. To make sure, the study estimates variance inflation factor (VIF) values in the main model, the pooled regression analysis.

Table 2
Summary of Pearson's Correlation[†]

Variable	LEV	CI	DUMINT	SIZE	PROFIT	Q	LA	UR
Z	-0.16**	-0.24**	0.21**	0.04	0.63**	-0.17**	0.41**	0.12*
LEV		0.02	-0.05	-0.09	-0.08	-0.03	-0.01	-0.01
CI			-0.42**	-0.12*	0.10	-0.47**	-0.65**	-0.09
DUMINT				0.50**	0.08	0.12*	0.14*	-0.03
SIZE					0.16**	-0.01	-0.21**	-0.14*
PROFIT						-0.39**	-0.21**	-0.09
Q							0.29**	0.06
LA								0.16**

[†]Z represents a modified Z-scores; LEV represents leverage; CI represents capital intensity, measured by fixed assets scaled by total assets; DUMINT is a dummy variable for internationalization; SIZE represents a firm's size, measured by the log of sales; PROFIT represents a firm's profitability, measured by net income scaled by revenue; Q represents a firm's growth opportunity, measured by Tobin's Q, and LA represents a firm's holding of liquid assets, measured by current assets scaled by total assets.

Main Findings

As discussed earlier, the study performed a pooled regression analysis using the Newey-West HAC standard errors so that the regression coefficients obtained from the analysis are adjusted for potential autocorrelation and heteroscedasticity issues. The analysis results appear in Table 3. First, the model appears to explain significant variations in Z-scores with F-value of 108.58 at a significance level of less than 0.1% (75% of adjusted R^2 value). Second, all three main factors present a significant effect on Z-scores; leverage (LEV) has a negative impact with a t-value of -2.88; capital intensity (CI) shows a positive impact with a t-value of 2.82, and internationalization (DUMINT) has a positive effect with a t-value of 3.14. While three control variables (a firm's profitability with a t-value of 30.10, holding of liquid assets with a t-value of 13.73, and economic condition with a t-value of 2.92) show a significant and positive effect on Z-scores, the two control variables, firm size (t-value of 0.40) and Tobin's Q (t-value of -0.75) do not appear to have a statistically significant impact on Z-scores. Variance inflation factor (VIF) values suggest the model has no severe multicollinearity problem; the highest VIF value is 2.67.

In addition, the study examined a curvilinear effect of leverage by including a squared form of leverage in the model. This aspect of the analysis arises from the trade-off theory which suggests an inverted U-shaped relationship between leverage and firm value, and such an inverted U-shaped relationship may have a certain impact on the relationship between leverage and degree of financial distress. However, the results of this additional analysis show an insignificant effect in linear form from leverage and a significantly positive effect of the squared

form of leverage. The result suggests a negative linear relationship between leverage and Z-scores, consistent with the findings from the main model.¹

Table 3
Summary of Pooled Regression Analysis (Newey-West Analysis)[†]

$$Z_t = \alpha_0 + \alpha_1 LEV_t + \alpha_2 CI_t + \alpha_3 DUMINT_t + \alpha_4 SIZE_t + \alpha_5 PROFIT_t + \alpha_6 Q_t + \alpha_7 LA_t + \alpha_8 UR_t$$

Variable	Coefficients	t-value	p-value	VIF
LEV	-0.031985	-2.88**	0.004	1.02
CI	0.5228563	2.82**	0.005	2.67
DUMINT	0.2155745	3.14**	0.002	1.64
SIZE	0.0092216	0.40	0.692	1.56
PROFIT	1.523964	30.10***	<0.000	1.27
Q	-0.0333306	-0.75	0.454	1.54
LA	3.669248	13.73***	<0.000	2.13
UR	0.0948601	2.92**	0.004	1.04
N		291		
Adj R ²		0.748		
F-value		108.58***		

[†]Z represents a modified Z-scores; LEV represents leverage; CI represents capital intensity, measured by fixed assets scaled by total assets; DUMINT is a dummy variable for internationalization; SIZE represents a firm's size, measured by the log of sales; PROFIT represents a firm's profitability, measured by net income scaled by revenue; Q represents a firm's growth opportunity, measured by Tobin's Q, and LA represents a firm's holding of liquid assets, measured by current assets scaled by total assets.

DISCUSSIONS AND IMPLICATIONS

The study examined three main determinants of the degree of financial distress: leverage, capital intensity, and internationalization. Findings suggest that leverage increases the degree of financial distress while capital intensity and internationalization reduce financial distress. These findings appeared after controlling for other potential confounding factors: a firm's growth opportunity, liquidity, size, profitability, and economic conditions.

Findings of a negative effect of leverage on financial distress support the aspect of Opler and Titman (1994) and Andrade and Kaplan (1998), but not Jensen (1989). The negative relationship between leverage and Z-scores implies that as a firm increases its debt level, the firm's financial distress increases since high Z-scores indicate a sound financial condition while low Z-scores indicate a financially distressed condition. With mixed and inclusive findings on this relationship in previous literature and especially, a lack of significant attention to the relationship in the hospitality literature, this study's findings, first, add empirical support for the contentions of the group of researchers, including Opler and Titman (1994) and Andrade and Kaplan (1998) in the general financial distress literature. At the same time, the current study's findings enrich the hospitality financial distress literature by filling a void with regard to the relationship between leverage and financial distress.

This study also examined a curvilinear relationship between leverage and degree of financial distress, implied by the trade-off theory, but findings do not support such relationship. The findings of this study might not be appropriate to examine the trade-off theory because the theory suggests a relationship between leverage and firm value, not a direct relationship with financial distress. Perhaps, a high likelihood exists that financial distress does

¹ The results are available upon request.

not linearly correlate with firm value², and that could explain why a curvilinear relationship did not appear in the current study.

Regarding capital intensity, the study reveals that, as U.S. lodging firms increase their capital intensity (fixed assets), firms' degree of financial distress decreases. This is consistent with the view that firms can use fixed assets as collateral especially when they are in a financially distressed situation (Charalambakis, et al., 2008), and is inconsistent with the view point by Brealey and Myers (1984) and Shapiro and Titman (1986) that argued for an aggravating role of capital intensity on financial distress.

The third determinant of financial distress is internationalization, and this study used a dummy variable to determine if publicly traded U.S. lodging firms with international operations are more likely to reduce financial distress than domestic U.S. lodging firms. The findings support such proposed relationship. Although the hospitality literature has not extensively explored the financial distress issue in relation to internationalization, the current findings may be consistent with some of the general hospitality, internationalization literature, such as Lee (2008) that found a positive relationship between internationalization and firm value performance. Thus, a conjecture may be that internationalization may help U.S. lodging firms reduce their business risks in general.

For practitioners, the findings of this study may provide some managerial implications. U.S. lodging industry executives, managers, investors, and hospitality financial and strategic management educators will benefit from the findings. Hotel executives and managers may consider some of the findings in developing their corporate strategies to manage the degree of financial distress. Even though modifying corporate strategies is difficult over the short term, managers and executives are often aware of potential long-term hardships arising in the future, and they may consider incorporating the findings of this study in developing their long-term strategies. U.S. lodging investors and analysts may use the findings when evaluating their investment portfolios. For example, risk-oriented investors may use the information when forming their portfolios especially with financially distressed companies. Hospitality financial educators and analysts may also use the findings for developing financial distress model specifically for the lodging industry.

REFERENCES

- Agmon, T., & Lessard, D.R. (1977). Investor recognition of corporate international diversification. *Journal of Finance*, 32 (4), 1049-1055.
- Altman, E.I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *Journal of Finance*, 23 (4), 589-609.
- Andrade, G., & Kaplan, S. (1998). How costly is financial (not economic) distress – Evidence from highly leveraged transactions that became distressed. *Journal of Finance*, 53 (5), 1443-1493.
- Beaver, W. (1966). Financial ratios as predictors of failure. *Journal of Accounting Research*, 4 (*Empirical Research in Accounting*), 71-111.
- Betker, B. (1997). The administrative cost of debt restructuring: Some recent evidence. *Financial Management*, 26 (4), 56-58.
- Brealey, R., & Myers, S. (1984). *Principles of corporate finance*. Ney York: McGraw-Hill.
- Charalambakis, Espenlaub, & Garrett, (2008). Leverage Dynamics, the Endogeneity of Corporate Tax Status and Financial Distress Costs, and Capital Structure. Working Paper.
Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1102168
- Fatemi, A.M. (1984). Shareholder benefits from corporate international diversification. *Journal of Finance* 39 (5), 1325–1344.
- Graham, J.R., Lemmon, M.L., & Schallheim, J.S. (1998). Debt, lease, taxes, and the endogeneity of corporate tax

² If such a linear relationship in fact exists, a negative relationship would be expected since higher financial distress will more likely to translate into lower firm value.

- status. *Journal of Finance*, 53 (1), 131-162.
- Jensen, M. (1989). Eclipse of the public corporation. *Harvard Business Review*, 67 (5), 1-29.
- Kraus, A., & Litztenberger, R.H. (1973). A state-preference model of optimal financial leverage. *Journal of Finance*, 28 (4), 911-922.
- Lee, S. (2008). Internationalization of U.S. multinational hotel companies: Expansion to Asia VS. Europe. *International Journal of Hospitality Management*, 27 (4), 657-664.
- Lessard, D. (1973). International portfolio diversification. *Journal of Finance*, 28 (3), 619-632.
- Levy, H., & Sarnat, M. (1970). International diversification of investment portfolios. *American Economic Review*, 60 (4), 668-675.
- MacKie-Mason, J.K. (1990). Do taxes affect corporate financing decisions? *Journal of Finance*, 45 (5), 1471-1491.
- Markowitz, H.M. (1952). Portfolio Selection. *Journal of Finance*, 7 (1), 77-91
- Min, J.H., & Prather, L.J. (2001). Tobin's q , agency conflicts, and differential wealth effects of international joint ventures. *Global Finance Journal*, 12 (2), 267-283.
- Ofek, E. (1993). Capital structure and firm response to poor performance. *Journal of Financial Economics*, 34 (1), 3-30.
- Opler, T., & Titman, S. (1994). Financial distress and corporate performance. *Journal of Finance*, 49 (3), 1015-1040.
- Shapiro, A.C., & Titman, S. (1986). *An integrated approach to corporate risk management*. In J. M. Stern & D. H. Chew (Eds.), *The revolution in corporate finance*: 215-229. Oxford: Blackwell.
- Singh, M., & Nejadmalayeri, A. (2004). Internationalization, capital structure, and cost of capital: Evidence from French corporations. *Journal of Multinational Financial Management*, 14 (2), 153-169.