THE CHOICE OF LONG-TERM DEBT IN THE U.S. LODGING INDUSTRY

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Abstract

The purpose of this paper is to provide an empirical test of established capital structure theory regarding those factors relevant to the long-term debt choice made by hotel firms. Regression models were used to test variables representing contracting costs, signaling to capital markets and tax effects. The contracting cost variables include growth opportunities, firm size and physical plant assets. The signaling variable is measured by the probability of future bankruptcy. Finally, the non-debt tax shield, as represented by depreciation, measures the tax effect. Surprisingly, a significantly positive relationship was found between growth opportunities and long-term debt. On the other hand, the signs of the remaining variables were as expected. A significantly positive relationship was determined between long-term debt and firm risk, and also between long-term debt and fixed assets. A significantly negative relationship was found between long-term debt and depreciation tax shields.

KEYWORDS: hotel financing, hotel capital structure.

Introduction

A variety of theories have been used to explain the capital structure decision of firms. Although the empirical work has progressed to include examinations of the capital structure of specific firms or conducting comparative analysis across firms, only limited work has been done regarding the capital structure of the hospitality industry. The research objective of this paper is to assess the effect of three non-mutually exclusive hypotheses on the long-term debt decision of U.S. lodging firms. These explanations most recently discussed in the financial literature include: 1) agency costs of contracting; 2) signaling to capital markets; and 3) taxes. The outcome of this research may be an improved understanding of the use of long-term debt capital by hotel firms.

Limited work has been completed regarding capital structure in the hospitality industry, specifically, hotel firms. One of the first studies was completed by Kwansa, Johnson and Olsen

(1987). Other studies include those done by Andrew and Schmidgall (1993), Sheel (1994) and Gu (1995/96). These last two studies were completed primarily for comparative purposes and did not focus exclusively on long-term debt, which is of particular importance to the hotel industry.

It is believed that more powerful information and insightful explanations can be garnered by examinations of specific industries instead of assessing the characteristics of a divergent sample of firms. This belief is borne out in the financial literature with research regarding the capital structure decision of specific industries such as supermarkets (Chevalier, 1995), hospitals (Ligon, 1997) and restaurants (Upneja & Dalbor, 2001). Accordingly, this research focuses on the factors that influence the critical long-term debt decision of hotel firms.

The next section, Review of Literature, will discuss the literature pertinent to the major factors affecting long-term debt selection. Section three 3, Testable Hypotheses, will present the set of testable hypotheses, while Section 4, Data and Methodology, will discuss the methodology employed to test the hypotheses. Findings are discussed in Section 5, Results. Conclusions and Implications for Future Research are presented in the last section.

Review of Literature

In general, the reliance on debt financing by the hotel industry is significant. Research by Andrew and Schmidgall (1993) shows that somewhere between 60 and 70 percent of the capitalization of hotel firms is comprised of debt. However, this research does not necessarily indicate the type or maturity of debt. Other literature includes general studies involving a variety of industries that examines the reasons for selecting long-term debt, as those outlined by Barclay

and Smith (1995) and Wald (1999). These reasons include contracting costs hypotheses, signaling hypotheses and tax hypotheses. It is important to note that these factors are not mutually exclusive, and the recent research on capital structure takes into account the interrelationships between these variables. Although previous research has focused on a variety of industries, the following capital structure hypotheses can be applied specifically to the hotel industry.

Contracting Costs Hypotheses

Although his research does not delineate debt into specific maturities, the ideas of Myers (1977) tend to indicate that hotel firms should use more long-term debt. According to Myers, future investment opportunities represent options whose value depends upon exercising them at the optimum time. While the market recognizes the value of these growth opportunities, their value is not reflected on the book values of the balance sheet. With more growth opportunities, the conflict between lenders and owners increases. Accordingly, the owners of a firm can reduce these conflicts by reducing the amount of debt in the capital structure, shortening the maturity of the debt, or both.

In a related sense firm assets can be roughly divided into two groups: Those that are heavily dependent upon further investment by the firm and those that are largely unrelated to additional firm investment. The distinction must be considered rather generally, as the values of nearly all assets are dependent upon further investment by the firm. However, Myers argues that variable costs can be considered discretionary investments—including labor, marketing and research and development costs. On the other hand, physical plant expenditures ("assets in

place") have costs associated with them that can be considered non-discretionary (interest expense, for example). Accordingly, firms with greater future discretionary investment or growth opportunities should use less debt, as found by Barclay and Smith (1995). On the other hand, firms with more assets in place should use more debt.

An additional argument related to growth opportunities involves debt maturity. Given the conflict between owners and lenders, numerous considerations may have to be made to insure optimal investment decisions. Myers (1977) suggests numerous methods for solving this conflict including rewriting and renegotiating debt contracts. However, these methods may produce contracts that are difficult to enforce or costly to construct. Therefore, one relatively efficient solution for firms with significant growth opportunities is to reduce the maturity of their debt. Accordingly, one would expect firms with more assets in place to not only have more debt, but more *long-term* debt as well. Furthermore, recent research by Wald (1999) provides empirical evidence of a positive relationship between assets-in-place (property, plant and equipment) and the use of long-term debt for a wide variety of domestic and international firms.

The problem of moral hazard is also related to the contracting costs. As previously mentioned, Myers (1977) argues that debt can create agency problems between owners and lenders, leading to more costly contracting. An increase in debt causes shareholders to invest suboptimally, thereby leaving any downside risk to the lenders. As discussed by Wald (1999), the amount of physical assets in place such as plant and equipment may show creditors that these assets are being gainfully employed. Because lodging firms usually have a majority of their

capital invested in fixed assets, it follows that the direct relationship between the use of debt and the amount of physical assets employed should operate for lodging firms.

Another consideration may be firm size. Debt issues have a significant fixed cost component that may not be afforded by smaller firms. Barclay and Smith (1995) found evidence to support this assumption. Smaller firms that cannot afford the out-of-pocket costs associated with long-term debt issues prefer private short-term debt. This preference is confirmed by Wald (1999), who found a positive relationship between firm size and long-term debt for both U.S. and international firms. Moreover, larger firms have a more diluted ownership structure, encouraging the use of debt as the potential for personal bankruptcy losses decreases.

Signaling Hypotheses

The relationship between various measures of firm quality and the use of debt is still somewhat unclear. One significant problem is the "reverse causation" problem of whether or not managers take risky actions before issuing long-term debt or the other way around. This problem is a spin-off of the famous chicken and egg paradox where it cannot be determined whether the chicken came first or the egg. Nevertheless, many researchers including Bradley, Jarrell and Kim (1984) and MacKie-Mason (1990) found a negative relationship between risk (as measured by costs of financial distress) and the use of debt.

Part of the problem in determining the relationship between firm quality and use of debt may also be attributable to how risk (proxy for firm quality) is measured in empirical studies. Kim and Sorensen (1986) found a significant positive relationship between both the variation in

earnings before interests and taxes (EBIT) and long-term debt and the variation in market value of equity and long-term debt. As discussed by Barclay and Smith (1995), long-term debt is more sensitive to potential mispricing. If investors cannot assess firm quality, low-quality firms will issue debt that is overpriced. With overpricing directly related to maturity structure, lower-quality firms would prefer to issue long-term debt. Conversely, high-quality firms would prefer debt of shorter maturity.

Wald (1999) focused on factors affecting the long-term debt ratio of firms in the U.S. as well as in Japan, the United Kingdom, Germany and France. Wald's measure of risk was the variance of earnings divided by total assets, expecting to find a negative relationship a priori. Wald's results, however, were, by his own description, puzzling. He found a large and significantly positive relationship between firm risk and long-term debt for firms in the United Kingdom and Japan. Wald attributes this relationship to reverse causation between firm risk and long-term debt with more debt turning managers into risk-takers. Another interesting explanation is that certain companies have risky business climates. Moreover, having debt issued by a few relatively large banks makes a potential transfer easier in the case of bankruptcy. Finally, Dalbor and Upneja (2001) found a significant positive relationship between firm risk (as measured by bankruptcy probability) and long-term debt for restaurant firms.

Tax Hypotheses

DeAngelo and Marsulis (1980) argue that firms with greater non-debt tax shields issue less debt. MacKie-Mason (1990) found a negative relationship between the amount of

depreciation taken by a firm and the use of debt. Moreover, given the fixed-asset intensive nature of the industry, non-debt tax shields may be significant in determining the capital structure of hotel firms.

The previous discussion reveals that firms with a significant amount of physical assets will issue more long-term debt because of moral hazard effects. On the other hand, a significant amount of depreciation attached to physical assets should be negatively correlated with debt. As shown by Wald (1999), both physical plant and depreciation must be included in a statistical analysis to segregate their effects. Wald found a positive relationship between long-term debt and physical assets and a negative relationship between long-term debt and depreciation tax shields.

Testable Hypotheses

In order to answer the research question regarding the relevant factors that influence the choice of long-term debt in the U.S. lodging industry, the following alternative hypotheses were developed:

H1: U.S. lodging firms with more growth opportunities will use less long-term debt.

H2: Larger U.S. lodging firms will use more long-term debt than smaller firms.

H3: Low-quality U.S. lodging firms will use more long-term debt than high-quality firms.

H4: U.S. lodging firms with more property, plant and equipment (PP&E) use more long-term debt.

H5: U.S. lodging firms with more non-debt tax shields use less long-term debt.

Given these hypotheses to be tested, a number of variables were selected to be used in the hypothesis testing. The variables and methodology used for the hypothesis tests are discussed in the following section.

Data and Methodology

The sample of hotel firms is from the COMPUSTAT database for the years 1974 through 1997 and restricted to the COMPSTAT code for hotels (DNUM 7011). The major difference between this study and that of Barclay and Smith (1995) is that only the lodging sector is included, whereas the Barclay and Smith (1995) study included all firms on the COMPUSTAT database. The firm-year observation was deleted from the sample, if any variable could not be calculated. The final sample contained a total of 218 firm-year observations representing 28 different hotel companies. After deleting the outliers, 211 observations remained in the final sample. Observations were treated as outliers, if they were above the size adjusted cutoff for both Cook's D and Covratio. Summary statistics of the data are provided in Table 1.

(Table 1 here)

This study's model is based largely on research by Barclay and Smith (1995) and Wald (1999) and selects variables based upon the three major theories of capital structure: contracting costs, signaling to capital markets and tax effects. The contracting cost variables include growth opportunities, firm size and PP&E. While the latter two variables are rather straightforward, there is a lack of consensus regarding the measurement of growth opportunities.

However, as discussed by Gaver and Gaver (1993), market-to-book ratios are the most common measure used in financial research. This ratio reflects the market's ability to recognize intangible growth opportunities not shown on a balance sheet.

The signaling variable is measured by the probability of future bankruptcy, using Ohlson's Revised O-Score. This variable and its components were calculated by Ohlson (1980). Although Ohlson used a variety of firms to calculate this variable, it was selected for this study because of its significance in previous research regarding capital structure in the restaurant industry (Upneja & Dalbor, 2001; Dalbor &Upneja, 2001). The calculation of this variable is provided in the Appendix.

Finally, the non-debt tax shield, as represented by the ratio of depreciation expense to total assets, measures the tax effect. Long-term debt is defined as any debt that has maturity of more than three years, as used by Barclay and Smith (1995). Although this three-year period is somewhat arbitrary, small increases in the number of years to maturity do not significantly alter the results. A summary of the variables used and their expected signs is shown in Table 2.

(Table 2 here)

Accordingly, the full regression model is as follows:

$$LTDR = \alpha_0 + \alpha_1 MVA + \alpha_2 MVFL + \alpha_3 PPE + \alpha_4 OO + \alpha_5 DEP + \varepsilon_i$$

where:

LTDR = Ratio of debt maturing in more than three years to total assets

MVA = Growth opportunity variable measured by the ratio of the market value of the firm's assets to the book value of assets. The market value of the firm's assets is equal to the book value of assets minus the book value of equity plus the market value of equity (Barclay & Smith, 1995).

MVFL = Natural log of the market value of stockholder equity, adjusted for inflation.

PPE = Ratio of PP&E to total assets.

OO = Firm quality variable as measured by the firm's O-Score. The calculation of this variable is explained in the Appendix.

DEP = Non-debt tax shield variable measured by the ratio of depreciation to total assets.

ε_i = Error term of the regression.

Cross-sectional pooled regression is used to model with a sample of data between firms and over time. This method is consistent with many papers (Barclay & Smith, 1995) previously discussed that examined changes in capital structure between firms.

Results

Before discussing the results, it seems logical to review the correlation matrix of the variables used in the regression analysis as a preliminary check of the model. The correlation coefficients are shown in Table 3. The largest correlation is between the PP&E to assets ratio and the depreciation to assets ratio. The second largest correlation is between the PP&E to assets ratio and the long-term debt ratio. However, it is not expected that multicollinearity will be a threat to our conclusions. Variance inflation factors were also calculated (not shown here) in the regression analysis and were found to be between 1 and 1.8 for both models, indicating a lack of multicollinearity. The regression results are shown in Table 4.

(Tables 3&4 here)

The first model contains all five variables of interest. The first variable, MVA, representing growth opportunities, is positive and significant. This result is surprising because it was expected that the sign would be negative, similar to other firms and also to restaurant firms (Upneja & Dalbor, 2001). It is possible that lodging firms find it more convenient to finance fixed assets with debt. As the market value increases, firms will want to expand but do not have enough internal funds to finance growth and choose debt. Additionally, it may be the case that even though hotel firms have growth opportunities, they are better off using more debt. Hotel firms are generally fixed-asset intensive with large incremental investment expenditure requirements. The use of debt may be better for the owners, because the additional cash investments are prohibitively large and debt is readily available for large firms that invest in tangible assets.

The second variable, firm size, is not significantly different from zero in the first model; it is excluded from the second model. It may be the case that the type of assets financed (as will be discussed in following paragraphs) is more significant for hotel firms than firm size. As discussed above, hotel firms primarily expand by franchising and not as much by direct investment in properties. Therefore, traditional measures of size may not be adequately measuring size. Some lodging-specific measures of size may need to be developed.

The firm quality variable was found to be positive and highly significant, as expected. Although there may appear to be a reverse causation problem between risk and debt, this result is similar to results Upneja and Dalbor (2001) found for the restaurant industry that included a lagged variable for probability of bankruptcy. Moreover, as discussed by Wald (1999), most hotel assets are tangible and represent valuable collateral. Therefore, lenders may be confident

in obtaining a reasonable settlement of the debt despite the relatively high business risk associated with the hotel industry.

The last two variables, PPE and DEP, are both significant and have the expected signs. As previously discussed, tangible fixed assets may give lenders more comfort when issuing debt given the collateral value of assets in place. This result supports the findings of Wald (1999). Finally, firms with large depreciation tax shields tend to use less debt. This result is consistent with DeAngelo and Marsulis (1980) and MacKie-Mason (1990).

Conclusions and Implications for Further Research

This paper has attempted to build upon the previous financial literature by examining the three most recent explanations for the use of long-term debt in capital structure—contracting costs, signaling and tax effects. Unlike other research, firm size was not found to be a significant factor in the selection of long-term debt for hotel firms. A surprising result was that the growth opportunity, as conventionally measured, is significant and positive. Speculation arose on the possible reasons for this result but future research is needed to investigate this phenomenon. On the other hand, variables representing firm quality, PP&E and depreciation tax shields were significantly related to the long-term debt ratio, as expected.

The results presented here for the lodging industry are somewhat different than those found in the restaurant industry by Upneja and Dalbor (2001), particularly for the growth opportunity and firm size variables. As discussed earlier, the fixed-asset intensive nature of the industry is a much more important factor than some of the "traditional" variables that have been

used in the financial literature for other types of firms. It is clear that more research needs to be done to find a more comprehensive explanation of the long-term debt decision of hotel firms

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Table 1
Descriptive Statistics for Data Sample

Variable	N	Mean	Standard deviation
Long-term debt ratio	211	0.32	0.18
Market value to book value	211	1.25	0.41
Firm value ($million)	211	612.17	1374
Log of firm value	211	3.78	2.38
Ohlson's O-Score	211	0.54	0.29
PP&E to total assets	211	0.63	0.23
Depreciation to total assets	211	0.04	0.02

Note: The observations are derived from 28 different hotel firms. The descriptions and the formulas of the variables are given in Table 2.

Table 2
Definitions of Variables used in the analysis

Variable	Variable Used & Calculation	Expected Sign
Long-term debt (dependent)	% of total debt maturing in more than 3 years	
Growth opportunities	Ratio of market value of assets to book value where market value of firm assets = book value of assets - book value of equity + market value of equity*	-
Firm size	Natural log of market value of firm in constant dollars	+
Firm quality	Ohlson's O Score	-
PP&E	Ratio of net PP&E to total assets	+
Non-debt tax shield	Ratio of depreciation to total assets	-

Table 3. Correlation Matrix of OLS Regression Variables

Variable	LTDR	MVA	MVFL	OO	PPE	DEP
LTDR		0.09	-0.06	0.49	0.40	0.14
MVA			0.11	-0.15	-0.11	-0.20
MVFL				-0.32	0.12	0.05
OO					0.16	0.13
PPE						0.65

Note: The table reports the Pearson correlation coefficients for the different variables used in the regression analysis. LTDR = long-term debt to total assets, MVA (growth opportunity variable) = market value of assets to book value of assets, MVFL (firm size variable) = natural log of stockholder equity (adjusted for inflation), OO (firm risk variable) = Ohlson's O Score (indication of the probability of bankruptcy), PPE = PP&E to total assets, DEP (non-debt tax shield variable) = depreciation to total assets.

Table 4. Ordinary Least Squares Regression Results

Independent Variable	Intercept	MVA	MVFL	OO	PPE	DEP	F	Adj.R^2
LTDR	-0.095	0.076*	0.002	0.300*	0.360*	-1.917*	28.05*	0.3918
LTDR	-0.086	0.077*		0.294*	0.365*	-1.921*	35.11*	0.3938

Note: This table reports the results of regressing the long-term debt ratio on independent variables. The first model includes all independent variables. The second model deletes the MVFL variable found insignificant in the first model. The regression was performed on the full set of 211 firms that remained in the sample. LTDR = long-term debt to total assets, MVA (growth opportunity variable) = market value of assets to book value of assets, MVFL (firm size variable) = natural log of stockholder equity (adjusted for inflation), OO (firm risk variable) = Ohlson's O Score (indication of the probability of bankruptcy), PPE = PP&E to total assets, DEP (non-debt tax shield variable) = depreciation to total assets, F = F value of the F-test for the regression model, Adj. R^2 = adjusted R^2 for the model.

* Significant at the 0.01level.

Appendix
Derivation of Ohlson's O-Score

The revised O-score (probability) of bankruptcy is calculated in two steps. First, there is calculation of the numerical value (NV) used in the O Score based upon the following formula:

$$NV = -1.249 - (0.211*SIZE) + (2.262*TLTA) - (3.451*WCTA) - (0.293*CLCA) - (0.907*OENEG) + (1.08*NITA) - (0.838*FUTL) + (1.266*INTWO) - (0.96*CHIN)$$

The second step is to use the value of NV in the O-Score formula. The O-Score represents the probability of bankruptcy and ranges from 0 (extremely low probability of bankruptcy) to 1 (indicating a 100% probability of bankruptcy). The O Score is calculated as follows:

$$O\ Score = 1/(1 + e^{-NV})$$

An explanation of the variables used in the NV calculation is provided below:

Table A1
Variables Used in the NV Calculation

Variable	Calculation
SIZE	Log of total assets
TLTA	Total liabilities divided by total assets
WCTA	Working capital divided by total assets
CLCA	Current liabilities divided by current assets
OENEG	If total liabilities > total assets, OENEG = 1
	If total liabilities ≤ total assets, OENEG = 0
NITA	Net income or loss divided by total assets

FUTL	Funds received from operations divided by total liabilities
INTWO	If the firm has reported a net loss for the current period AND the previous period INTWO =1; otherwise, 0.
CHIN	Change in net income = absolute value of current year net income minus absolute value of net income in prior year