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AN EMPIRICAL INVESTIGATION OF THE LEASE-DEBT RELATION IN THE RESTAURANT AND RETAIL INDUSTRY

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ABSTRACT

Prior research empirical research has produced conflicting findings on the lease-debt relation. While some studies provide evidence that leases substitute for debt, other studies show the lease-debt relation to be complementary. This study investigated the lease-debt relation in a sample of 233 restaurant and retail firms from 2006-2008. The results show that leasing and debt are significantly and inversely related. On average, $1 of leasing displaced approximately $0.50 of debt. The results also provide additional evidence that growth opportunities and firm size are important determinants of leasing.

Key Words: leasing, debt, substitute, complement, restaurant, retail

INTRODUCTION

Leasing is a large and important source of financing for many restaurant companies. Restaurant companies use operating leases to acquire fixed assets such as land, buildings, and equipment, without making large upfront cash payments that are commonly associated with debt financing. Since both leases and debt are similar in their characteristics and involve a contractual claim of fixed cash flows, financial theories have suggested that leases and debt are substitutes. However, the degree of substitutability between debt and leases remains an unresolved empirical issue. Ang and Peterson (1984) called this an unresolved puzzle. Thus far, the empirical evidence on the lease-debt substitutability has been mixed. There is evidence that leases and debt are substitutes (Bayless and Diltz, 1986; Marston and Harris, 1988) as well as evidence that the relation is complementary (Ang and Peterson, 1984). On the other hand, Mehran et al. (1999) find mixed evidence on the relation between debt and leasing.

The purpose of this study is to investigate the degree of substitutability between leases and debt financing in a sample of 233 restaurant and retail firms from 2006-2008. Using firm lease disclosure data from annual 10-K reports, this study employs the discounted cash flow technique and constructive lease capitalization methodology of Imhoff, Lipe and Wright (1991, 1997) to estimate the discounted present value of operating lease payments. This unrecorded amount of operating leases is added to capital leases on the balance sheet to provide for a more comprehensive measure of leasing. Based on prior capital structure research, the lease-debt relation is then evaluated within a multiple regression framework including various proxy control variables that influence the leasing-debt decision.

This study will contribute to the existing literature on the lease-debt substitutability research by employing a more comprehensive measure of leasing to estimate the degree of substitutability between leases and debt financing. Financial statement users, investors, creditors, regulators, and academics, will find the information useful and relevant in assessing and evaluating the lease-debt substitutability.

LITERATURE REVIEW

Static Tradeoff Theory

The static tradeoff theory of capital structure suggests that firms will tradeoff the interest tax shield benefits of debt against the costs of financial distress such as bankruptcy. The theory suggests that leases and debt are substitutes because leasing involves a fixed claim obligation similar to debt and thus, consumes debt capacity. Therefore, an increase in debt (leases) will lead to a corresponding decrease in leases (debt). The empirical evidence on the lease-debt substitutability thus far has been mixed. While there is some evidence of a complementary relation (Ang and Peterson, 1984), others find evidence that is largely consistent with the tradeoff theory that leases and debt are substitutes (Bayless and Diltz, 1986; Marston and Harris, 1988; Adeji and Stapleton, 1996; Beattie et al., 2000). In contrast, Mehran et al. (1999) find a complementary relation between debt and capitalized leases but no relation between debt and operating leases.

Empirical research in the hospitality industry has largely focused on the determinants of debt policy with few studies on leasing (Marler, 1993; Upneja and Dalbor, 1999). Upneja and Dalbor (1999) examined the relation between tax rates and leasing behavior for a sample of restaurant firms and find a positive relation between marginal tax rates and debt policy and capital leases and a negative relation between operating leases and marginal tax rates. In contrast, Koh and Jang (2009) find debt and financial distress to be positively related to operating leases in the hotel industry suggesting not only a complementary relation between debt and leasing but also lodging firms in strong financial condition were more likely to use operating leases. However, their measure of operating leases suffers from measurement error because it is based on annual operating lease expense rather than the present value of operating leases.

Contracting Cost Theory

The existence of risky corporate debt in a firm's capital structure can also create conflicts of interest between debtholders and stockholders over the firm's investment opportunities. These conflicts of interest can impose agency or contracting costs thereby increasing the cost of debt and reducing the value of the firm. Financial contracting cost theory predicts that firms with higher growth opportunities will face severe underinvestment problem and hence are less likely to use debt financing including secured debt and capitalized leases. Hence, a negative relation is expected between growth opportunities and debt and leasing. Studies show that firms with high market-to-book ratios have significantly low debt ratios (Sharpe and Nguyen, 1995; Graham et al. 1998). Graham et al. (1998) provide evidence that the use of all three financial instruments (debt, capital leases and operating leases) is negatively related to growth opportunities (market to book ratio).

Empirical findings on the contracting cost theory in the hospitality industry show differences between lodging and restaurant firms. While the findings of a negative relation between growth opportunities and debt usage for restaurant firms is consistent with prior research (Dalbor and Upneja, 2002), however, the findings for lodging firms are contrary to expectations (Dalbor and Upneja, 2004).

METHODOLOGY

Leasing Dependent Variable

Because proposed new accounting rules will require the capitalization of operating leases on the balance sheet and eliminate the distinction between operating and capital leases, a more comprehensive measure of leasing is used in this study. Leasing is defined as the sum of book value of capital leases and present value of operating leases scaled by the market value of the firm. Market value is defined as the sum of market value of assets plus the present value of operating leases. The discounted cash flow (DCF) method is employed to estimate the present value of the operating lease payments (PVOL). To implement the DCF technique, this study follows the constructive lease capitalization methodology developed by Imhoff, Lipe, and Wright (1991, 1997). However, instead of a 10% incremental interest rate and 15 year lease life used in prior studies, the incremental borrowing rate

and the remaining lease life is allowed to vary by firm. Capital leases are measured as the book value of capital leases divided by the market value of the firm.

Explanatory Variables

Financial theory predicts a negative relation between debt and leasing indicating that leasing displaces debt capacity. The debt policy variable is measured as the book value of total debt (short-term and long-term) net of capital leases and divided by the market value of the firm. Debt usage is expected to be negatively related to leasing.

Financial contracting theory also predicts that firms with higher growth opportunities are more likely to face underinvestment problems and hence use less leasing. Consistent with prior research, the market-to-book ratio is used to proxy for a firm's investment opportunity set. The market-to-book ratio is defined as the market value of assets divided by the book value of assets. Market value of assets is defined as the book value of assets less the book value of equity plus the market value of equity. This ratio is expected to be negatively related to leasing.

Tax based theories of optimal capital structure predict a negative relation between leasing and the corporate marginal tax rate. To test the relation between taxes and leasing in this study, the predicted coefficients of the marginal tax rates in Graham and Mills (2008) are used to compute the before financing tax rates for each firm. This tax variable is expected to be negatively related to the comprehensive measure of leasing but no prediction is made about its relation to capital leases.

The static tradeoff theory predicts that firms with higher expected costs of financial distress will use fewer leases which imply a negative relation between financial distress and leasing. Following prior research (Graham et al., 1998), financial distress is measured using Altman's (1968) modified z-score with a lower score indicating a higher potential for financial distress. Financial distress is expected to be negatively related to leasing.

The availability of collateral may also affect a firm's financing policy because a firm can use its valuable assets to obtain more favorable financing at a lower cost and consequently increase its debt capacity. This suggests a positive relation between the collateral value of assets and leasing. Collateral value of assets is measured as the net amount of property, plant and equipment (PPE) and scaled by book value of assets.

Finally, firm size is expected to influence leasing policy. Large firms are more likely to finance with debt because these firms are more diversified, have more stable cash flows and can easily exploit economies of scale in external financing while smaller firms will find external financing costly and therefore more likely to resort to leasing. Firm size is measured as the log of the market value of the firm. Firm size is expected to be negatively related to leasing.

Research Design

The main analysis employs pooled ordinary least squares (OLS) cross-sectional regressions in which the comprehensive lease ratio (capital leases plus operating leases) is regressed on the debt ratio and other control variables that proxy for theoretical determinants of leasing. This model is specified as follows (see definitions of variables in notes to Table 3):

$$CLR_i = \alpha_0 + \beta_1 DR + \beta_2 TR_i + \beta_3 GO_i + \beta_4 ZS_i + \beta_5 CVA_i + \beta_6 Size_i + \beta_7 ID \; \varepsilon_i \qquad (1)$$

As a basis of comparison, an OLS regression is also specified for a restricted sub-sample of firms that report only capital leases. The coefficient (β_1) in the above equation measures the lease-to-debt displacement ratio rather than the debt-to-lease displacement ratio. Therefore, to measure the debt-to-lease displacement ratio, Equation (1) will be re-estimated with the debt ratio as the dependent variable and the comprehensive lease variable as the explanatory variable consistent with prior research (Beattie et al., 2000).

Data and Sample Selection

The sample for the study was drawn from all active public restaurant and retail firms from S&P's *Compustat* database during the three year period from 2006-2008. Firms that were subject to bankruptcies, mergers/acquisitions, going private, and lack of complete data, were dropped from the sample. From an initial list of 366 firms (112 restaurant firms and 254 retail firms), 133 firms were deleted (48 restaurant firms and 85 retail firms) for the above reasons. The final sample comprised of 233 firms (64 restaurant firms and 169 retail firms) and 699 firm-year observations from 2006-2008.

RESULTS

Descriptive Statistics

The descript statistics for the overall sample of 233 firms are presented in Table 1. The average (median) firm had total assets of $3.6 billion ($695 million) and generated sales of $7.1 billion ($1.3 billion).

Table 1: Descriptive Statistics

	N	Mean	Median	Std. Dev.
Firm Size ($millions)	699	3,588	695	12,362
Net Sales ($millions)	699	7,086	1,256	27,306
Firm Market Value ($million)	699	7,226	1,341	23,821
Log of Market Value (Size)	699	7.3	7.2	1.8
Comprehensive Leases ($million)	699	889	276	1,816
Comprehensive Leases/Market Value (%) (CLR)	699	.226	.201	.141
Comprehensive Leases/Market Value - subsample	342	.218	.198	.136
PV of Operating Leases ($million)	699	835	267	1,678
PV of Operating Leases/Market Value (%) (OLR)	699	.217	.189	.136
Total Debt ($million)	699	995	126	3,619
Debt Ratio (%) (DR)	699	.145	.083	.171
Collateral Value of Assets (%) (CVA)	699	.395	.386	.21
Marginal Tax Rates (%) (TR)	699	.306	.350	.089
Modified z-score (ZS)	699	2.61	2.71	1.57
Growth opportunities (GO)	699	1.68	1.39	1.09

Notes: This table presents a summary of the descriptive statistics for a number of variable. Some statistics are provided in dollar amounts and others presented as ratios. Where applicable, some statistics have been computed for a sum-sample of firms that reported capital leases. Definitions of variables are provided in Table 2-3.

When operating leases are capitalized, the present value of operating lease liabilities (PVOL) is an average (median) of $835 million ($267 million) for the overall sample. When operating lease liabilities are added to capital leases, the total lease liabilities (comprehensive lease ratio) is an average (median) amount of $889 million ($276 million) or 23% (20%) of market value. The results also show that total debt (including short-term debt) net of capital leases, amounted to a median value of $126 million or 8% of market value which is substantially less than the ratio of operating lease liabilities to market value. Overall, there is considerable variation in the use of debt and leasing across firms with a substantial amount of off-balance sheet operating lease liabilities. Finally, collateral value of assets accounted for an average 40% of total assets with firms facing predicted average marginal tax rates of 31%, z-scores of approximately 2.6 and estimated market-to-book ratios of 1.7.

Univariate Analysis

Table 2 shows the results of tests of differences (t-tests) between restaurant and retail firms. For capital leases, these tests were performed within the sub-sample of firms that reported capital leases. The results show no significant differences in the comprehensive leasing ratio, debt ratio and marginal tax rates and weak evidence of

differences in the capital lease ratio. On the other hand, significant differences are observed between the two groups for growth opportunities (GO), collateral value of assets (CVA), modified z-scores and firm size. Restaurant firms have significantly higher growth opportunities and substantially higher collateral value of assets than retail firms. However, retail firms are significantly larger, use more operating leases and are less likely to face financial distress than restaurant firms.

Table 2: Tests of Mean Differences

Variable	N	Restaurant	Retail	Diff	t-stat	p-value
Comprehensive Lease Ratio (CLR)	699	.212	.231	-.019	-1.61	.109
Capital Lease Ratio (CL)	342	.029	.015	.014	1.81	.073
Operating Lease Ratio (OLR)	699	.197	.224	-.027	-2.31	.021
Debt Ratio (DR)	699	.158	.140	.018	1.24	.214
Collateral Value (CVA)	699	.562	.332	.230	12.58	.000
Marginal Tax Rates (TR)	699	.300	.308	-.008	-1.06	.290
Modified z-score (ZS)	699	1.691	2.963	-1.272	-9.71	.000
Growth Opportunities (GO)	699	1.918	1.587	.331	3.60	.000
Firm Size (Size)	699	6.504	7.546	-1.042	-7.20	.000

Notes: This table presents t-tests differences in means between restaurant firms and retail firms. Comprehensive lease ratio (CLR) is defined as the sum of the book values of capital leases plus the present value of operating leases and divided by the market value of the firm. Market value of the firm is defined as the book value of total assets less the book value of common equity plus the market value of equity plus the present value of operating lease liabilities. Capital lease ratio (CL) is defined as the book value of capital leases divided by the market value of the firm. Operating lease ratio (OLR) is measured as the present value of operating leases divided by the market value of the firm. The total debt ratio (DR) is defined as the sum of total long-term debt plus short-term debt divided by the market value of the firm. Growth opportunities (GO) is the market-to-book ratio and defined as the market value of assets divided by the book value of total assets. Market value of assets is defined as the book value of total assets less the book value of common equity plus the market value of equity. Collateral value of assets (CVA) is defined as net property, plant and equipment divided by the book value of total assets. The before financing book simulated marginal tax rates (TR) are obtained from John Graham's website. Missing tax rates are predicted based on the predicted book simulated coefficients estimated in Graham and Mills (2008). The measure of financial distress (ZS) is the modified version of Altman's (1986) z-score. Firm size (Size) is measured as the natural log of the market value of the firm.

Regression analysis using comprehensive lease ratio

A pooled OLS cross-sectional regression is then specified for the overall sample for the main results using the comprehensive lease ratio including dummy variables for industry sector and time. All OLS regressions were estimated with robust standard errors to mitigate any heteroskedasticity. Multicollinearity was also assessed and found to be within conventional limits (variance inflation factors < 2) in all regressions.

The OLS regression results using the comprehensive ratio are presented in Table 3. Consistent with theory, the relation between debt and total leasing is highly significant and negative across all four models. The results provide evidence that leasing substitutes for debt and supports the tradeoff theory of capital structure. If capital leases are excluded from the equation, the relation between operating leases and debt would still be highly significant and negative implying that operating leases and debt are indeed substitutes. These results are consistent with those of Beattie et al. (2000) in the UK but stand in contrast to Mehran et al. (1999) who found an insignificant positive relation among US firms.

Table 3: OLS Regression using Comprehensive Lease Ratio (CLR)

Variable	Overall Sample		Sub-Sample	
	Model 1	Model 2	Model 3	Model 4
Constant	.502 (17.52)***	.462 (16.30)***	.614 (15.02)***	.591 (14.64)***
DR	-.259 (-9.55)***	-.271 (-10.35)***	-.309 (-7.58)***	-.326 (-8.19)***
GO	-.049 (-6.85)***	-.043 (-6.97)***	-.056 (-6.21)***	-.048 (-5.72)***
CVA	.041 (1.29)	.034 (1.09)	.065 (1.74)*	.074 (1.99)**
TR	-.206 (-2.89)***	-.178 (-2.63)***	-.215 (-2.36)**	-.189 (-2.17)**
ZS	-.009 (-2.19)**	-.010 (-2.54)**	-.012 (-0.97)	-.013 (-1.07)
Size	-.010 (-3.42)***	-.011 (-3.60)***	-.017 (-4.81)***	-.019 (-5.23)***
ID	-.032 (-2.03)**	-.034 (-2.19)**	.029 (1.26)	.024 (1.06)
Y07		.025 (2.45)**		.017 (1.29)
Y08		.067 (5.90)***		.057 (3.88)***
Observations	699	699	342	342
R^2	.293	.329	.359	.386
F-stat	25.98***	28.09***	20.85***	18.75***

Notes: This table presents the results of pooled OLS cross-sectional regressions where the dependent variable in each model is the comprehensive lease ratio (CLR) which is defined as the sum of the book values of capital leases plus the present value of operating leases and divided by the market value of the firm. Models 1 and 2 are based on the overall sample (including firms with no reported capital leases) while Models 3 and 4 is a sub-sample that excludes firms with no reported capital leases. Market value of the firm is defined as the book value of total assets less the book value of common equity plus the market value of equity plus the present value of operating lease liabilities. The total debt ratio (DR) is defined as the sum of total long-term debt plus short-term debt less capital leases and scaled by the market value of the firm. Growth opportunities (GO) is the market-to-book ratio and defined as the market value of assets divided by the book value of total assets. Market value of assets is defined as the book value of total assets less the book value of common equity plus the market value of equity. Collateral value of assets (CVA) is defined as net property, plant and equipment divided by the book value of total assets. The before financing book simulated marginal tax rates (TR) are obtained from John Graham's website. Missing tax rates are predicted based on the predicted book simulated coefficients estimated in Graham and Mills (2008). The measure of financial distress (ZS) is the modified version of Altman's (1986) z-score. Firm size (Size) is measured as the natural log of the market value of the firm. Industry (ID) is measured using a dummy variable that is equal to one if the firms is a restaurant firm and zero otherwise. Year dummies (Y07 and Y08) for 2007 and 2008 are included in the model with 2006 as the base year. All OLS regressions are estimated with heteroskedasticity-consistent robust standard errors with t-stats in parentheses. ***, **, * correspond to significance at the 1%, 5% and 10% levels respectively.

The results show growth opportunities are also significantly and negatively associated with leasing, consistent with the view that firms with higher growth opportunities are less likely to use leasing. The coefficient on the collateral value of assets in Models 3 and 4 provide some evidence that firms with valuable assets can obtain more favorable financing at a lower cost and consequently increase their debt capacity. The results also show a significant negative relation between marginal tax rates and supporting the tax hypothesis that low tax rate firms lease more than high tax rate firms. While the relation between financial distress and leasing is significantly negative

for the overall sample, however, the results are inconclusive in Models 3 and 4 due to the smaller subset of firms. The significant negative relation between firm size and leasing shows a pervasive use of leasing among smaller firms and to a lesser extent among larger firms. The restaurant industry also has a significantly lower magnitude of total lease usage compared to retail firms in Models 1 and 2 but not in Models 3 and 4 due to a smaller number of observations for restaurant firms. Finally, the inclusions of year dummy variables indicate that firms significantly increased their usage of leasing in 2008 relative to 2006.

The empirical evidence thus far has suggested that leasing and debt are indeed substitutes consistent with prior studies (Marston and Harris, 1988; Adedeji and Stapleton, 1996; Beattie et al. 2000). To make a direct estimate of the debt-to-displacement ratio, the OLS regressions in Table 3 are re-estimated with debt as the dependent variable and leasing as a predictor. The total leasing ratio is found to be negatively significant at the 1% level with an average estimated debt-to-lease displacement ratio of -41% in Models 1 and 2 and -50% in Models 3 and 4 of Table 3. These results indicate, on average, $1 of total leasing (capital leases plus operating leases) displaced approximately $0.50 of debt during the 2006 to 2008 period.

CONCLUSIONS

This study investigated the relation between leasing and debt to determine whether they are substitutes or complements. Using a more comprehensive measure of total leasing, the results of this study provide evidence that leasing and debt are substitutes in the restaurant and retail industry. Leasing consumed debt capacity on a less than dollar-for-dollar basis. On average, $1 of leasing displaced approximately $0.50 of debt. The magnitude of total leasing is also significantly greater in the retail industry than the restaurant industry. Moreover restaurants firms were found to be significantly smaller in size, had higher collateral values of assets, lower z-scores, and higher growth opportunities when compared to retail firms. Proposed changes in lease accounting rules are expected to have significant financial implications for the restaurant and retail sectors given the widespread and pervasive use of off-balance sheet operating leases in these sectors. These rules are expected to negatively impact financial statement ratios and presentation especially leverage, capital, and performance ratios. Future research should investigate the impact of the new rules on financial policy changes after the rules are implemented as well as to assess its impact on firm values. Finally, it should be noted that this study is limited by the assumptions employed and the exclusion of many features of operating leases, including lease terms, residual value guarantees, renewal terms and contingent rentals.

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