# A VALUE RELEVANCE EXAMINATION OF THE CURRENT LEASING STANDARD

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## ABSTRACT

BRADLEY P. LINDSEY: A Value Relevance Examination of the Current Leasing Standard
(Under the direction of Wayne Landsman and Edward Maydew)

In the wake of the prominent accounting scandals of the past several years, investors and standard setters are demanding increased corporate transparency. Nowhere is the demand for transparency more salient than with off-balance-sheet financing, of which lease accounting plays a major role. At the end of 2004, total rental commitments by U.S. firms from off-balance-sheet operating leases exceeded $1 trillion. As standard setters reconsider leases as part of their broad reexamination of off-balance-sheet financing, they do so without the benefit of empirical research documenting whether capital market participants find the current leasing standard value relevant. This paper examines whether as-if capitalized operating lease liabilities and capital lease liabilities are both relevant and sufficiently reliable to be priced and explores whether equity investors value operating and capital leases differently. The results are consistent with the market viewing both operating and capital leases as economic liabilities of the firm. However, the results also indicate that capital market participants price operating and capital lease liabilities differently, consistent with the bright-line tests of the current leasing standard identifying economic differences in operating and capital leases. Thus, continuing to require lease disclosures by different lease classifications would assure that equity investors will not suffer from a loss of value relevant information in the pricing of leases.

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## TABLE OF CONTENTS

## LIST OF TABLES

# CHAPTER 1

# INTRODUCTION

This paper examines the value relevance of operating and capital leases to investigate whether equity investors price operating lease disclosures in the notes to the financial statements differently than capital lease amounts recognized on the balance sheet. Ever since Statement of Financial Accounting Standards No. 13 "Accounting for Leases" (SFAS 13) became effective in 1976, leases that meet certain criteria have been required to be capitalized on the balance sheet, creating both a capital lease asset and a capital lease liability.[1] Leases not meeting any of the capitalization criteria under SFAS 13 are classified as operating leases, resulting in an annual rental expense over the lease term and the disclosure of rental commitments related to future years in the notes to the financial statements.[2]

At the end of 2004, total rental commitments by U.S. firms from off-balance sheet operating leases equaled $1.05 trillion.[3] Had these operating lease rental commitments been

[1] The FASB issued SFAS 13 in 1976 requiring retroactive capitalization of all capital leases. In order to allow sufficient time for lessees with numerous lease contracts to analyze existing lease arrangements and to provide an opportunity for lessees to settle contractual violations resulting from the SFAS 13 capitalization criteria, the SEC required implementation of SFAS 13 by firm fiscal year-ends beginning in December 1978.

[2] The appendix provides a brief summary of the lease classification criteria in SFAS 13 as well as a simple example illustrating the differing accounting treatment for operating and capital leases.

[3] This is a conservative estimate of the extent of operating lease activity, comprising only minimum operating lease rental commitments from the footnote disclosures of publicly-traded firms with nonmissing leasing variables available in Compustat. In addition, the operating leases of private firms as well as contingent rental payments (percentage of sales or profits) and lease renewal options are also excluded from this total as prescribed under SFAS 13.

capitalized, I estimate that the as-if capitalized operating lease liabilities for U.S. firms at the end of 2004 would exceed $625 billion. In comparison, long-term debt for U.S. firms totaled more than $6.5 trillion at the end of 2004. Accordingly, operating lease rental commitments that remain off the balance sheet account for approximately nine percent of corporate debt. Utilizing a conservative estimate that all missing observations in Compustat represent no leasing activity, more than 86 percent of firms listed on Compustat entered into operating lease transactions with little variation across industries. Thus, not only does operating lease activity generate significant cash outlays but these data suggest that operating leases are pervasive.

The magnitude of leasing undertaken as operating leases dwarfs that undertaken as capital leases. At the end of 2004, the total amount of capital lease liabilities recognized by publicly-traded firms was $89.8 billion or $16.2 million per firm. In contrast to operating leases, only 36 percent of firms report capital lease liabilities with the frequency varying from 17 to 52 percent of firms across industries as measured by one-digit SIC codes. Simply comparing the relative magnitudes of operating and capital lease activity reveals that approximately 85 percent of leasing obligations take place under leases that avoid the lease capitalization criteria of SFAS 13.

Concern over the magnitude and pervasiveness of leases, as well as the role of lease accounting in alleged corporate accounting scandals, resulted in the requirements for expanded lease disclosure in the Sarbanes-Oxley Act. Specifically, Section 401 mandates increased disclosure of contractual obligations including capital and operating leases in the management discussion and analysis portion of public filings. In Sarbanes-Oxley, Congress also expressed concern over rules-based accounting standards and directed the Securities and

Exchange Commission (SEC) to study the feasibility of moving to principle-based standards. The lease capitalization criteria in SFAS 13 are perhaps the most often mentioned examples of rules-based standards.

In addition to requiring increased disclosure, Section 401 of the Sarbanes-Oxley Act also called upon the SEC to conduct a study on the extent of off-balance sheet arrangements and whether current financial statements transparently reflect the economics of off-balance sheet arrangements. In its report recently issued to the President of the United States and to Congress to satisfy this legislatively mandated requirement, the SEC recommended that "the FASB should undertake a project to reconsider the standards for accounting for leases."[4] To support this recommendation, the SEC states that "the current 'all or nothing' lease accounting guidance is not designed to reflect the wide continuum of lease arrangements that are used, and therefore, it cannot transparently and consistently reflect the varying economics of the underlying arrangements."

The FASB appears to be keenly aware of the current uneasiness associated with leasing transactions and related off-balance sheet activities. In January 2003, the FASB addressed some off-balance sheet arrangements by issuing Interpretation No. 46 "Consolidation of Variable Interest Entities" (FIN 46).[5] However, basic off-balance sheet financing, including operating lease transactions that do not require a special purpose entity (SPE), have not yet been re-evaluated. The FASB Board members, industry representatives, and academic

[4] The SEC issued the "Report and Recommendations Pursuant to Section 401(c) of the Sarbanes-Oxley Act of 2002 On Arrangements with Off-Balance Sheet Implications, Special Purpose Entities, and Transparency of Filings by Issuers" on June 15, 2005.

[5] In December 2003, the FASB issued FASB Interpretation No. 46 (revised December 2003), *Consolidation of Variable Interest Entities* (FIN 46R), which broadens the rules surrounding whether firms should consolidate an entity. FIN 46R replaced FASB Interpretation No. 46, *Consolidation of Variable Interest Entities*, and provided clarification on how the new consolidation rules should be applied and when they should be implemented by various entities.

participants that comprise the Financial Accounting Standards Advisory Council (FASAC) recently prioritized in the 2005 FASAC survey the five specific, standard-setting recommendations identified by the SEC in its June 2005 report. FASAC members ranked lease accounting as the second most important standard-setting priority of the SEC recommendations, and FASB Board members ranked lease accounting as the third most important standard-setting priority. In a recent Wall Street Journal article (*Lease Accounting Draws Scrutiny*; November 18, 2005), the FASB's chairman Robert Herz stated that the FASB "will decide early next year whether to add a formal project on lease accounting to its agenda." Mr. Herz also added that "if approved, the project he envisions would be 'a comprehensive relook at the whole model' for lease accounting, which he said hasn't had a major overhaul since 1976."

As standard setters gauge whether to reconsider SFAS 13 and the accounting for leases, they do so without the benefit of empirical research documenting whether capital market participants find the current leasing standard value relevant.[6] To fill this gap, my paper explores whether operating lease disclosures and recognized capital lease amounts under SFAS 13 are both relevant and sufficiently reliable to be priced, and if so, whether the market values operating and capital leases differently. In order to test my hypotheses, I construct an as-if capitalized operating lease liability measure by discounting firms' future operating lease rental commitment amounts with a firm-specific discount rate. The results show a negative, significant relation between as-if capitalized operating lease liabilities and market value of equity. Likewise, the results reflect a negative, significant relation between capital lease liabilities and market value of equity. Thus, the market seems to view both disclosed

[6] Imhoff et al. (1993) document that equity investors incorporate operating lease disclosures in the airline and retail grocery industries into risk assessments over a six year period from 1984 to 1990. Additionally, Ely (1995) investigates whether the market views operating leases as property rights in assessing equity risk.

operating lease commitments and recognized capital lease liabilities as economic liabilities of the firm. However, the results also indicate that the market prices as-if capitalized operating lease liabilities and recognized capital lease liabilities differently, consistent with the current leasing standard identifying economically different leases. Specifically, the pricing multiple on the capital lease liability is significantly greater in magnitude than the pricing multiples on the as-if capitalized operating lease liability and long-term debt. In addition, I find that the pricing multiple on the as-if capitalized operating lease liability is not significantly different from the pricing multiple on long-term debt.

This paper makes three contributions to the existing literature. First, it affirms that lease accounting under SFAS 13 is value relevant, equipping standard setters with empirical evidence of the current leasing standard as they reconsider lease accounting. Second, it documents that operating and capital leases are priced differently, assisting standard setters in crafting a new leasing standard. Specifically, requiring capitalization of all leases would result in a loss of information to investors if recognized lease amounts and the associated footnote disclosures were merely aggregated across all lease classifications. Third, this paper utilizes descriptive evidence on the magnitude of as-if capitalized operating lease debt to explain in part why firms appear underlevered. In particular, researchers have evaluated firms' capital structures to assess if firms are more highly leveraged to enjoy the favorable tax benefits of debt as compared to equity (Graham 2000 among others). This paper raises the question whether all debt, of which operating leases comprise a sizable portion, has been accounted for in examining the relation between debt and marginal tax rates.

The paper proceeds as follows: Section 2 provides a review of prior lease accounting research and develops the hypotheses; Section 3 describes the research design; Section 4

summarizes the sample selection and descriptive statistics; Section 5 presents the empirical findings; and Section 6 concludes the study. An appendix provides a brief summary of the lease classification criteria under SFAS 13 and illustrates the differences in accounting for operating and capital leases.

# CHAPTER 2

## BACKGROUND AND HYPOTHESIS DEVELOPMENT

Leasing occurs when the user of an asset is not the most efficient owner of an asset. Independent of the required accounting treatment, a lease commits firms to cash outlays in the future in exchange for the right to use an asset. For many firms, these commitments are substantial sums that span many years. The issuance of SFAS 13 resulted in the formation of certain criteria (bright-line thresholds) that determine lease classification. These leasing criteria establish whether the future cash outflows attributable to a lease and the use of a related lease asset are recognized on the balance sheet as a capital lease asset and liability, or whether the cash flows are disclosed in the notes to the financial statements as future rental expense related to an operating lease.

Researchers have utilized the leasing arena to address a number of important research questions; however, the value relevance of operating and capital leases under SFAS 13 remains an unresolved question in the literature.[7] To address this question, my paper explores whether operating lease disclosures and recognized capital lease amounts are both relevant and sufficiently reliable to be priced. An understanding of the relevance and reliability of operating and capital leases and an assessment of whether operating lease disclosures and recognized capital lease amounts are priced differently under the current leasing standard may prove useful to standard setters should SFAS 13 be re-evaluated.

[7] Ge (2005) finds that greater off-balance-sheet operating lease activity leads to lower future earnings and documents that investors fail to fully anticipate this finding.

Prompted by the prominent accounting scandals of the past several years, standard setters are focusing on corporate transparency. With respect to leasing, there is evidence that managers use operating leases to achieve off-balance sheet financing, avoiding the lease capitalization criteria of SFAS 13 (El-Gazzar et al. 1986, Imhoff et al. 1988).[8] Indeed, a large and specialized leasing industry has developed over time, supported by accountants and attorneys adept at navigating the accounting and tax rules for leases. While SFAS 13 has survived for more than twenty-nine years, it has come under increased scrutiny as a result of the perceived growing manipulation of financial statements using leases.

Surprisingly, despite Sarbanes-Oxley and the emphasis on increased transparency and improved accounting standards, over a trillion dollars of operating lease rental commitments remain off corporate balance sheets. A Wall Street Journal article describes the current leasing landscape as follows (*How Leases Play A Shadowy Role In Accounting*; September 22, 2004): "U.S. companies are still allowed to keep off their balance sheets billions of dollars of lease obligations . . . The practice spans the entire spectrum of American business and industry, relegating a key gauge of corporate health to obscure financial statement footnotes, and leaving investors and analysts to do the math themselves. . . [T]he special accounting treatment for many leases means that a big slice of corporate financing remains in the shadows. For all the tough laws and regulations set up since Enron Corp's 2001 collapse, regulators have left lease accounting largely untouched."

Determining whether investors and analysts peer into the "shadows" to value as-if-capitalized operating lease liabilities is an empirical question. Numerous value relevance

[8] Additionally, two lessor accounting empirical studies (Powers and Revsine 1989, Johnson et al. 1993) examine the incentive managers have to overestimate residual values so they can front-load income under either operating or capital lease accounting. In his review piece, Lipe (2001) notes that he knows of no other empirical research studies on lessor accounting.

studies have established a significant relation between accounting disclosures and the market value of equity, (Landsman 1986, Barth 1991, Aboody 1996, Ayers, 1998 among others) consistent with these accounting amounts being relevant to equity investors and sufficiently reliable to be priced. Specific to leasing, researchers have found evidence that investors appear to adjust risk for operating lease disclosures (Bowman 1980, Ely 1995, Imhoff et al. 1993, Marston et al. 1988) and to account for off-balance sheet operating leases in the pricing of debt (Lim et al. 2005). To equity investors, the relevance of leases seems likely given the pervasiveness and sheer magnitude of leases. However, the reliability of a current leasing disclosure that aggregates lease commitments for one to five years into the future and a lump sum amount beyond five years is uncertain.

Reliability plays a key role in equity investors' valuation of accounting amounts. Barth et al. (2003) develop a theoretical recognition and disclosure model and find that recognition of a highly unreliable accounting amount can result in greater price informativeness. Specifically, they find that reliability relative to relevance is more important than reliability per se. Thus, as limited as the operating lease disclosures are under SFAS 13, the relevance of leases given their sheer magnitude and pervasiveness may very well translate into investors pricing a relatively unreliable disclosure.

Assuming that equity investors view capital lease liabilities and as-if capitalized operating lease liabilities as economic liabilities of the firm, I make the following predictions (stated in alternative form):

> **Hypothesis $1_a$**: Ceteris paribus, there is a negative relation between capital lease liabilities and the market value of equity.
>
> **Hypothesis $1_b$**: Ceteris paribus, there is a negative relation between as-if capitalized operating lease liabilities and the market value of equity.

In addition to investigating whether operating and capital lease liabilities are value relevant, I examine whether operating and capital lease liabilities are priced differently. Some FASB Board members and FASAC members have called for increased transparency and the capitalization of all leases (see FASAC surveys 2002 – 2005). International standard setters have proposed the capitalization of all lease assets and liabilities included in lease contracts (Lipe 2001). The popular business press echoes these same sentiments as well (WSJ September 22, 2004; WSJ November 18, 2005). If operating and capital leases are priced differently, standard setters should also consider maintaining lease classifications for recognized amounts on the balance sheet and disclosed amounts in the notes to the financial statements. Otherwise, aggregating capital and operating lease financial statement information would result in a loss of information to investors (Lev 1968, Lev 1970 among others).

Anecdotal evidence suggests that managers navigate the current rule-based leasing standard to achieve the desired leasing treatment (Imhoff et al. 1988, Altamuro 2005). Thus, managers are afforded the option of hugging-up against the bright-line tests of SFAS 13 without triggering the lease capitalization requirement. Alternatively, the bright-line tests of the rule-based leasing standard could capture real economic differences in leasing activity.[9] It is possible that the SFAS 13 lease criteria tend to capitalize some types of assets more frequently than others, which could introduce real economic differences between capitalized and operating lease liabilities merely from the underlying leased assets. For example, a lease

[9] Graham et al. (1998) investigates the theoretical relation between marginal tax rates and lease classifications. The results show a negative, significant relation between true (operating) leases and marginal tax rates. With respect to financing (capital) leases, they find no relation with marginal tax rates and attribute the result to measurement error between tax and financial reporting lease classifications. Morsfield (2004) finds the hypothesized relation between both lease types and marginal tax rates in a private sample containing the actual tax lease classifications. Marginal tax rates may explain some of the pricing differences between operating and capital leases, but I suffer from the same measurement error issue as Graham et al. (1998) with financial accounting lease classifications.

term that equals or exceeds 75 percent of the economic life of land is impossible because land has an indefinite life, whereas a lease term that exceeds 75 percent of the economic life of computer equipment is likely given the rapid obsolescence of such equipment. Additionally, real property assets are more likely to appreciate in value than shorter-lived assets such as equipment. Thus, there is greater likelihood that the present value of the minimum lease payments of leased equipment would exceed 90 percent of the fair value at lease inception than would be true of a leased building. As such, economic characteristics of the underlying lease assets influence the accounting lease classification.

The lease classification criteria under SFAS 13 are intended to capture the economic effects of ownership, because "a lease that transfers substantially all of the benefits and risks of ownership … is similar, in many respects, to that of an installment purchase." Capital leases by definition result from lessees holding a leased asset for 75 percent or more of the remaining economic life of the asset or for a sufficiently long period of time that the lessor recoups at least 90 percent of its fair value at lease inception during the lease term.[10] Thus, capital lease liabilities reflect relatively longer lease terms and could price differently than a relatively shorter operating lease life because of the longer investment horizon.

In addition to the investment horizon, underlying leased assets that tend to appreciate in value potentially result in economically different lease arrangements then those that depreciate in value. Anecdotal evidence suggests that a large fraction of assets such as land and buildings that are leased result in operating lease treatment. These assets tend to appreciate on average. If a relatively larger fraction of operating leases consists of

[10] The economic life capitalization criterion is waived if the leased asset is in the last quartile of its economic life.

appreciating assets as compared to capital leases, equity investors could price as-if capitalized operating lease liabilities and capital lease liabilities differently.[11]

Under SFAS 13, only minimum lease payments are included in the capital lease liability and disclosed operating lease rental commitments. These amounts include non-contingent rental payments over the lease term, residual value guarantees, and any penalties paid for failure to renew the lease. To the extent the minimum lease payments understate the true economic lease liability because of contingent lease payments and lease renewal options, the pricing of as-if capitalized operating lease liabilities and capitalized lease liabilities could differ if contingent lease payments and lease renewal options reflect leasing transactions with one lease type more than the other.[12]

Accordingly, I make the following prediction (stated in alternative form):

> **Hypothesis 2**: Ceteris paribus, there is a significant difference between the pricing multiple on the as-if-capitalized operating lease liability and the market value of equity and the pricing multiple on the capital lease liability and the market value of equity.

[11] Accordingly, residual value guarantees inserted into lease contracts to protect lessors from use and maintenance decisions of the lessees (Smith and Wakeman 1985) may be priced differently by equity investors depending on the probability of whether and how much the underlying lease asset appreciates or depreciates.

[12] Generally, potential lessor and lessee bankruptcy should not result in pricing differences between operating and capital leases. Lessees are protected from lessor bankruptcies under both the old and new bankruptcy law (October 2005). Likewise, under the new and old lessee bankruptcy law, lessees have a specified period of time after filing bankruptcy to assume or reject lease contracts. The amount of time allotted depends on whether the underlying lease asset is commercial, personal, or residential property.

# CHAPTER 3

# RESEARCH DESIGN

Investigating the value relevance of disclosed operating lease rental commitment amounts and whether operating and capital lease liabilities are priced differently requires an estimation of the as-if capitalized operating lease liability. In addition, failure to include an estimation of the operating lease asset in the model specification results in an omitted correlated variable, resulting in the coefficient on the as-if capitalized operating lease liability capturing the net economic effect of operating lease activity. Because capital lease assets are included in the model, the coefficient on the capital lease liability reflects solely the economic effect of the liability. Thus, I cannot compare the pricing of the as-if capitalized operating lease liability and the capital lease liability without an estimation of the as-if capitalized operating lease asset.

## *3.1 Estimating the As-if Capitalized Operating Lease Asset and Liability*

To examine the value relevance of operating versus capital lease liabilities, I construct an as-if capitalized lease liability for firms' operating leases. Estimating the as-if capitalized operating lease liability (*OPLEASL*) requires a discount rate. As a departure from other studies (Imhoff et al. 1993, Graham et al. 1998) that assume a cross-sectional constant discount rate over the sample period, I construct a firm-specific discount rate to reduce measurement error. SFAS 13 requires firms to discount capital leases using the lesser of the

lessee's incremental borrowing rate or, if known, the lessor's implicit return on the lease contract.[13] In practice, the lessor's implicit rate of return on the lease is rarely known by the lessee. Thus, I estimate the lessees' incremental borrowing rate or firm-specific discount rate by dividing total interest expense by average total debt each year from 1994 through 2004 and computing the equal-weighted mean for each firm. For lump sum rental commitments, I compute the firm-specific equal-weighted mean rate that the rental commitments increase or decrease in years one through five (data items 96, 164-167) and apply that rate to the lump sum rental commitments beyond the fifth year. *OPLEASL* equals the sum of the discounted rental commitment amounts due in one, two, three, four, and five years as well as the discounted rental commitment amounts estimated in six years and beyond.

As noted previously, estimating the as-if capitalized operating lease liability poses a problem because of potential measurement error. To calibrate my operating lease capitalization methodology, I hand-collected a small sample of rental commitments for capital lease liabilities that exceeded $25M in 2001 and 2002. With the capital lease rental commitment amounts hand-collected from the Form 10-K, I can compare the capital lease amounts capitalized using my methodology with the actual reported capital lease liabilities. Assuming the payment streams of capital lease rental commitments mirror that of operating lease rental commitments, I can evaluate the amount of measurement error in my estimation methodology.

To illustrate the methodology I use to estimate the as-if capitalized operating lease liability, consider the discount electronics retailer Best Buy and the following rental

[13] Although the lessee rarely knows the lessor's rate of return on a lease contract, anecdotal evidence suggests that economic factors such as market interest rates, perceived lessee credit risk, lessor competition, asset collateral quality, and asset re-marketing prospects are some of the inputs into the lease terms and pricing function of lessors.

commitments disclosed in its Form 10-K for the 2002 fiscal year as well as the computed percentage decrease in the rental commitment amounts by year:

| Year | Rental Commitment Amount ($M) | % Increase (Decrease) |
|---|---|---|
| 2003 | 472.00 | |
| 2004 | 459.00 | (2.75) |
| 2005 | 417.00 | (9.15) |
| 2006 | 376.00 | (9.83) |
| 2007 | 361.00 | (3.99) |
| Thereafter | 2,698.00 | **(6.43)** |

I assume that the thereafter portion of the rental commitments are paid out at the equal-weighted annual mean rate of increase or decrease as the year one through year five rental commitment amounts. For example, rental commitments in year two reflect a 2.75 percent decrease compared to the rental commitments in year one [(459 – 472) /472)]. The equal-weighted annual mean rate of increase or decrease applied to the thereafter or lump sum rental commitment amount is -6.43 percent [(-2.75 + -9.15 + -9.83 + -3.99)/4].[14] Best Buy's equal-weighted mean discount rate from 1994 through 2004 equals 7.207 percent. The as-if capitalized operating lease liability (*OPLEASL*) is the present value of all of the rental commitment cash outflows as follows:

| Year | Rental Commitments ($M) | 7.207% PV Factor | PV of Cash Flows |
|---|---|---|---|
| 2003 | 472.00 | .9322 | 440.00 |
| 2004 | 459.00 | .8701 | 399.38 |
| 2005 | 417.00 | .8115 | 338.40 |
| 2006 | 376.00 | .7570 | 284.63 |
| 2007 | 361.00 | .7061 | 254.90 |
| 2008 | 337.79 | .6586 | 222.47 |
| 2009 | 316.07 | .6143 | 194.55 |
| … | … | … | … |
| 2018 | 147.62 | .3284 | 48.48 |
| Estimated operating lease liability | | | 3,066.45 |

[14] I assume all payments occur at the end of each year.

Developing a methodology to estimate the accompanying as-if capitalized operating lease asset is more challenging than estimating the as-if capitalized operating lease liability. Calculating an approximation of the as-if capitalized operating lease asset requires drawing inferences about the weighted average total life of leased assets, the weighted average remaining life of leased assets, and the appropriate weighted average depreciation method from the scheduled cash outflows. However, failure to estimate the operating lease asset translates into an omitted correlated variable in the regression model specification and makes comparing the pricing of capital lease liabilities and the as-if-capitalized operating lease liability a futile exercise.

To compute the as-if-capitalized operating lease asset, I first estimate the linear combination of net capital lease asset book value as a function of capital lease rental commitments in years 1 through 5 and the lump sum amount beyond year 5. These values are from the same hand-collected sample used to calibrate the as-if capitalized operating lease liability calculation. This step is detailed below in equation one as follows:

$$CAPLEASA_{it} = \beta_0 + \beta_1 CLRC1_{it} + \beta_2 CLRC2_{it} + \beta_3 CLRC3_{it} + \beta_4 CLRC4_{it} + \beta_5 CLRC5_{it} + \beta_6 CLRCLS_{it} + e_{it} \quad (1)$$

where *CLRCn* equals capital lease rental commitments in years 1 through 5 for firm i at time t, *CLRCLS* equals the capital lease rental commitment lump sum amount beyond year 5 for firm i at time t, and *CAPLEASA* equals the net book value of capital lease assets for firm i at time t. I utilize this vector of estimated rental commitment coefficients to compute an as-if capitalized operating lease asset as illustrated in equation two below:

$$OPLEASA_{it} = \hat{B}_0 + \hat{B}_1 OLRC1_{it} + \hat{B}_2 OLRC2_{it} + \hat{B}_3 OLRC3_{it} + \hat{B}_4 OLRC4_{it} + \hat{B}_5 OLRC5_{it} + \hat{B}_6 OLRCLS_{it} \quad (2)$$

where *OLRCn* equals operating lease rental commitments in years 1 through 5 for firm i at time t, *OLRCLS* equals the operating lease rental commitment lump sum amount beyond year 5 for firm i at time t, and *OPLEASA* equals the estimated net book value of operating lease assets for firm i at time t.

This estimation methodology implicitly assumes that operating and capital lease assets have the same depreciation methods and that the discount rate used under SFAS 13 for financial reporting purposes is equivalent. Additionally, I presuppose that parameter estimates from the hand-collected sample can be extended to all of the firms in the cross-section over the sample period. To the extent these assumptions do not hold, the as-if capitalized operating lease asset is measured with error. I focus my study on an examination of operating and capital lease liabilities and include the estimated operating lease asset amount in the adjusted book value of equity variable.

### *3.2 Empirical Specification*

Because balance sheet treatment is central to lease accounting, the main tests in this paper employ a model specification that expresses value as a function of earnings and book value (balance sheet) information similar to the framework developed by Ohlson (1995).[15] This approach has been used widely in the literature; examples include Aboody (1996), Collins et al (1997), Barth et al (1998), Aboody et al (1999), and Kallapur et al. (2004) among others. Furthermore, I benefit from research by Barth et al. (1999, 2005) who disaggregate accounting data to explore whether disaggregated accounting data have incremental explanatory power to equity book value and net income. I also have the advantage of drawing upon several prior studies that examine the value relevance of other obligation-

[15] Similar to Barth et al. (1998) and Kallapur et al. (2004), I do not rely on the Ohlson model (1995) as a basis for my predictions because of its limiting assumptions such as linear information dynamics.

related disclosures such as deferred tax liabilities (Amir et al. 1997, Ayers 1998, Givoly et al. 1992) and pension obligations (Barth 1991, Barth et al. 1992). In particular, I utilize the following regression framework:

$$MVE_{it} = \beta_0 CONSTANT_{it} + \beta_1 BVE_{it} + \beta_2 NI_{it} + \beta_3 NEG_{it} + \beta_4 NEGNI_{it} + \beta_5 CAPLEASL_{it} + \beta_6 DEBT_{it} + \beta_7 OPLEASL_{it} + \beta_8 GROWTH_{it} + \beta_9 \Sigma YEAR_{it} + \beta_{10} \Sigma INDUSTRY_{it} + e_{it} \quad (3)$$

where i and t denote firms and years, respectively. *MVE* equals market value of common equity, *CONSTANT* equals one divided by common shares outstanding, *BVE* is the book value of equity adjusted to exclude capital lease liabilities and long-term debt and to include the estimate for the as-if capitalized operating lease asset (*OPLEASA*) and the deferred tax asset created by capitalizing operating leases computed with Graham's (1996) computed marginal tax rates (*MTR*), *NI* equals earnings after discontinued and extraordinary items, *NEG* is an indicator variable equal to one for firm-year observations with a net loss, *NEGNI* is an interaction variable (*NEG*NEGNI*), *CAPLEASL* is the capital lease liability, *DEBT* equals long-term debt less capital lease liabilities (*CAPLEASL)*, *OPLEASL* equals the estimated as-if capitalized operating lease liability, *GROWTH* is the year ahead sales revenue, Σ*YEAR* is a categorical variable equal to one if the firm-year observation is a given year and zero otherwise, and Σ*INDUSTRY* is a categorical variable equal to one if the firm-year observation is in a given one-digit SIC code and zero otherwise.[16]

To allow for lease-specific information from the annual report to be impounded in price, the dependent variable *MVE* equals the market value of common equity three months after the fiscal year-end. *NEGNI* is intended to capture the differential pricing effects of firms

[16] Controlling for growth options is supported by the Ohlson (1995) model as the inclusion of other information relevant to investors. In addition to incorporating growth options, the one year ahead sales amount potentially controls for scale issues in this model specification (Barth et al. 1996).

with net losses as documented in Hayn (1995). Defining *NI* as net income after extraordinary items and discontinued operations satisfies the clean surplus assumption of the Ohlson model. It should be noted that I am unable to compute the net income effects of the as-if capitalized operating lease liability and net them against the operating lease expense in a firm-year. As such, in the valuation equation, the implicit assumption is that the net income effects are zero. Assuming a ten to 20 year lease term and discount rate of eight to twelve percent, the net income effects of capitalizing an operating lease are zero between 55 and 59 percent of the original useful life of the asset (Imhoff et al. 1991 and 1997).[17] Thus, the no income effect assumption inherent in my regression specification seems reasonable if firms in the cross-section have roughly constant levels of leasing activity.

In order to establish a baseline to compare the pricing of the as-if capitalized operating lease liability and the capital lease liability, I break out long-term debt (*DEBT*) from book value of equity in the model specification (equation 3). Moreover, if long-term debt is priced differently than the capital lease liabilities, I can triangulate my results with additional empirical evidence that aggregating operating and capital lease data may result in an information loss to investors. To control for heteroskedasticity, I report *t*-statistics that reflect White-adjusted (1980) standard errors. Also, I include industry and year fixed effects to control for industry-specific effects and time-specific macro-economic effects, respectively. In order to control for potential scale issues, I deflate all of the regression variables by common shares outstanding.

[17] These amounts assume no down payment on the lease and straight-line depreciation.

# CHAPTER 4

# SAMPLE SELECTION AND DESCRIPTIVE STATISTICS

In order to apply my as-if capitalized operating lease asset estimation methodology, I hand-collect a sample of capital lease intensive firms with disclosed capital lease rental commitment amounts and capital lease asset net book values. The hand-collected sample also allows me to calibrate my estimation of the as-if capitalized operating lease liability. For the hypothesis tests, I utilize Compustat to compile a representative sample of the economy to test the relations between lease liabilities and the market value of equity. The sample selection and descriptive statistics for both samples are detailed below.

## *4.1 Hand-collected Sample Selection and Summary Statistics*

The sample consists of firm-year observations from 2001 to 2002 pertaining to Compustat firms with at least $25 million of capital lease liabilities (data item 84). Using the 2001 and 2002 Form 10-Ks, I hand-collected the net book value of capital lease asset information as well as the capital lease rental commitment amounts for years 1 through 5 and the lump sum rental commitments beyond year 5. Panel A in Table 1 summarizes the sample selection criteria. There are 613 firm-year observations with the minimum threshold of $25 million or more in capital lease liabilities and positive total assets and sales. Deleting firm-year observations attributable to foreign firms and American Depository Receipts (199), regulated firms such as utilities and insurance companies (64), real estate investment trusts (10),

missing shares outstanding and price per share variables (44), missing firm-year observations attributable to capital asset data in the Form 10-K (77), missing capital asset accumulated depreciation data in the Form 10-K (28), missing rental commitment observations (17), negative shareholder's equity balances (20) and influential observations identified as studentized residuals greater than three from the Belsley et al. (1980) criteria (6) results in a final sample of 148 firm-year observations.

Panel B in Table 1 summarizes descriptive statistics for the estimated capital lease liability computed using the as-if capitalized operating lease liability methodology employed in the paper as well as the actual reported capital lease liability amount (data item 84) for the 148 hand-collected sample firm-year observations. The actual and estimated amounts from both distributions are strikingly similar suggesting that the combination of the estimated discount rate and the underlying assumption about the rate the lump sum capital lease rental commitment amounts are realized estimate the capital lease liability accurately. Thus, it appears that my method for estimating the as-if capitalized operating lease liability is sound and yields reliable results.

The as-if capitalized operating lease asset methodology implies that in the cross-section operating and capital leases have the same accounting discount rate when applying SFAS 13. In order to test the reasonableness of this assumption, Panel C displays the operating lease and capital lease rental commitment amounts by disclosed category for the hand-collected sample. The percentages of rental commitments in each category across both lease classifications are quite similar, but the percentage of capital lease rental commitments are slightly more front-loaded than the operating lease rental commitments. Panel C is indirect

evidence that operating leases have longer lease terms, suggesting that operating leases are attributable on average to longer-lived assets.[18]

Panel D presents the regression results for equation one. The high R-squared of 98.46 percent suggests that the rental lease commitment amounts capture almost all the variation in the capital lease asset net book value. Thus, if operating and capital leases have similar discount rates and are subject to similar depreciation methods, *OPLEASA* should be a reasonable estimate of the as-if capitalized operating lease asset.

### *4.2 Sample Selection and Descriptive Statistics for Hypothesis Testing*

I use Compustat data to examine the value relevance of as-if capitalized operating lease liabilities and capital lease liabilities as well as the pricing differences between these variables. Included in the main sample are firm-year observations from 2000 through 2003 for Compustat firms with positive net sales revenue (data item 12) and $10 million or more in total assets (data item 6). In order to compute the as-if capitalized lease amounts, disclosed amounts in the footnotes to the financial statements under SFAS 13 are needed. Specifically, data for rental commitments one to five years in the future (data items 96, 164-167), the disclosed lump sum amount for rental commitments more than five years into the future (data item 389), and an estimated discount rate computed as the equally-weighted mean percentage of interest expense to total debt for the years 1994 through 2004 serve as the relevant inputs into the computations. The equal-weighted mean discount rate over the 11-year period from 1994 through 2004 is used because current year leasing amounts are influenced by prior year lease investment decisions. The sample begins in 2000 because the thereafter portion of operating lease rental commitments (data item 389) is not reliably collected and included in

[18] The data are also consistent with operating leases being subject to larger and/or an increased percentage of residual value guarantees.

Compustat prior to that year. The *GROWTH* variable is defined as one-year-ahead sales which eliminates 2004 from the sample. Additionally, the effects of FIN 46 could potentially confound the results in 2004.

Table 2 summarizes the sample selection criteria. I remove foreign firms from the sample to assure that I am testing the valuation relevance of SFAS 13 and not an international leasing standard. Real estate investment trust (REIT) firm-year observations are deleted from the sample because of unique institutional features including no corporate level taxation and substantial distribution requirements. Utilities are removed because of regulatory incentives, as well as the fact that operating leases are not included in the rate base. I also remove firm-year observations for insurance companies because of regulatory incentives. Financial institutions are deleted for regulatory incentives, as well as the fact that Compustat does not compile capital lease liability data for banks. I exclude firm-year observations with negative shareholder's equity because my valuation model specification may not apply to these firms and to be consistent with prior research (Collins et al. 1997).

After deleting firm-year observations attributable to foreign firms and American Depository Receipts (3,832), real estate investment trusts (828), regulated firms such as utilities (663), insurance companies (509), and financial institutions (336), missing shares outstanding data (1,217) missing share price data (1,023), missing operating lease rental commitment amount data (4,227), missing capital lease liability data (528), missing long-term debt data (6), negative shareholder's equity balances (648), missing one-year-ahead sales revenue data (357), missing marginal tax rate data (351), and influential observations

identified from the Belsley et al. (1980) criteria (68), the final sample is comprised of 9,985 firm-year observations.[19]

Panel B of Table 2 presents the industry and year representation in the sample. The four-year sample period is represented almost equally by the four years in the sample period. Dividing the sample into one-digit SIC Codes, Panel B of Table 2 and Table 3 characterize the industry representation in the sample and compare it to the industry representation for the Compustat economy from 2000 through 2003 for the 24,578 firm-year observations that have positive net sales revenue and $10 million or more in total assets. The sample representation is lower for SIC 6 due to deleted REIT, insurance and financial institution firm-year observations. Likewise, the sample contains fewer SIC 4 observations because of deleted electric and natural gas utility firm-year observations. Table 3 also illustrates that substantial leasing activity is prevalent in the transportation industry (SIC 4 with a capital and operating lease mean liability of $60.97M and $479.63M respectively) and the wholesale and retail industries (SIC 5 with a capital and operating lease mean liability of $25.30M and $315.53M respectively).

Table 4 illustrates the balance sheet and financial statement ratio effects of capitalizing operating lease assets and liabilities. Anecdotal evidence suggests that financial accounting incentives, including enhanced performance and leverage ratios, result in managers navigating the bright-line tests of SFAS 13 to avoid the capitalization criteria. Accordingly, Table 4 presents an aggregated sample balance sheet for all 349 firms in the wholesale and retail industry (SIC 5) at the end of the 2003 fiscal year. The reported total assets, total liabilities, and total equity amounts are provided. Utilizing the as-if capitalized operating

[19] Specifically, I delete firm-year observations with studentized residuals in excess of the absolute value of three.

lease asset and liability methodologies detailed in the paper, over $121 million of liabilities and over $112 million of assets escape balance sheet treatment. Thus, operating leases explain in part why firms appear to be underlevered (Graham 2000). Assuming the same lease classification for tax purposes as financial reporting purposes, firms trade off deferred tax deductions for avoiding debt classification on the balance sheet for financial reporting purposes.[20]

The tax adjustment noted in Table 4 illustrates this trade-off. Specifically, a tax adjustment is made (over $2.7 million) to account for a deferred tax asset resulting from interest and depreciation tax deductions that exceed lease expense deductions utilizing firm-specific marginal tax rates (*MTR*). Factoring in the tax adjustment and assuming that all net income effects take place in prior years, stockholder's equity is reduced by over $5 million.

Utilizing simplified measures of return on assets, return on equity, debt, and debt-to-equity ratios, the reported amounts result in a higher aggregated return on assets measure, a lower aggregated debt-to-asset ratio, and a lower aggregated debt-to-equity ratio. Ignoring net income effects, the return on equity measure is higher because of the reduction in equity from capitalizing operating leases. Thus, Table 4 supplies empirical evidence that in the aggregate, wholesale and retail sample firms in 2003 enjoyed enhanced performance and leverage ratios from operating lease activity.

Table 5 presents descriptive statistics for the main regression variables in equation three, as well as for variables used to compute the regression variables. Despite deflating by common shares outstanding, the regression variables have skewed distributions as evidenced by different means and medians. Additionally, the magnitude and dispersion of operating

[20] This is a crude assumption given the use of the synthetic leasing structure to achieve capital lease treatment for tax purposes (increased tax deductions from depreciation and interest in the early life of the lease) and operating lease treatment for financial reporting purposes (less debt and assets on the balance sheet).

leases compared to capital leases differ markedly. The mean (median) of the as-if capitalized operating lease liability (*OPLEASL)* is $1.85M ($0.51M) compared to $0.12M ($0.00M) for the capital lease liability. The variables used to compute the as-if capitalized operating lease liability are also presented in Table 5. The estimated discount rate appears reasonable with a mean (median) estimate of 0.089 (0.073) percent. Also, Table 5 includes descriptive statistics for the as-if capitalized operating lease asset (*OPLEASA*). The mean ($1.51M) and median ($0.02M) values for *OPLEASA* are less than the corresponding mean ($1.85M) and median ($0.51M) values for *OPLEASL,* which is expected given that lease liability amounts exceed lease asset amounts except at lease inception and lease termination when these amounts are generally equal. Thus, these lease descriptive statistics affirm that the as-if capitalized operating lease asset and liability estimation methodologies employed in the paper appear reasonable. I include the *Stockholder's Equity* and *MTR* descriptive statistics as a barometer for the size and magnitude of the *BVE* variable and all variables that are subtracted from and added to *Stockholder's Equity* (data item 216).

Correlations among the regression variables for the regression model specification detailed in equation one are presented in Table 6. The Pearson and Spearman correlation coefficients detailed in Table 6 are all significantly different from zero at a significance level of five percent with the exception of three correlation coefficients that are bolded. Generally, it appears that firm investments in leasing capital and debt capital result in an increased market value of equity. The correlation between the dependent variable, *MVE*, and capital lease liability, *CAPLEASL*, has a different sign in the Pearson and Spearman correlation coefficient specification highlighting the need for multivariate regression analysis.

# CHAPTER 5

# REGRESSION RESULTS

In order to examine the value relevance of operating and capital leases, I utilize the multivariate regression model specification developed in equation three. Results are reported in Table 7. All *t*-statistics are computed using White-adjusted (1980) standard errors from the consistent, recomputed variance covariance matrix.

As a comparison to the equation three regression results presented in the final column, I include additional model specifications to provide for varying levels of aggregation of the three debt variables. Specifically, *ALLDEBT* is defined as the summation of all long-term debt (*DEBT*), capital lease liabilities (*CAPLEASL*), and the as-if capitalized operating lease liability (*OPLEASL*). *LEASEDEBT* equals capital lease liabilities (*CAPLEASL*) plus the as-if capitalized operating lease liability (*OPLEASL*). *NONCAPLEASL* equals long-term debt (*DEBT*) summed with the as-if capitalized operating lease liability (*OPLEASL*). Lastly, *NONOPLEASL* equals long-term debt increased by capital lease liabilities (*CAPLEASL*). In addition to providing robustness checks of the model specification in equation three, the differing levels of data aggregation allow me to more directly evaluate and triangulate my tests for the second hypothesis comparing the pricing multiples on the capital lease liabilities (*CAPLEASL*) and the as-if capitalized operating lease liability (*OPLEASL*).

In all of the model specifications, the 9,985 firm-year observations identified in Table 2 are used. In each model, *BVE* is adjusted to reflect the appropriate disaggregated debt

variables. The coefficient estimates on *BVE* range from 0.85 to 0.87 (*t*-statistics equal or exceed 17.02). Like *BVE,* the parameter estimates for *NI* exhibit little variation with values ranging from 0.50 to 0.53 (*t*-statistics equal or exceed 2.47). The low magnitudes of the *NI* variable and accompanying low values of the *t*-statistics likely reflect the losses incurred by many firms during and surrounding the recession in the sample period. It should be noted that the model specification assumes no net income effects on average from operating lease capitalization. Also, in every model specification, the interaction variable *NEGNI* approximates the magnitude of *NI* (-0.61 to -0.63) providing evidence that net loss firms are valued differently than profitable firms (Hayn 1995). Lastly, the parameter estimate for *GROWTH* ranges from 0.02 to 0.03. The *t*-statistics are all positive and significant at the five percent level.

Combining all debt, the coefficient on *ALLDEBT* equals -0.90 with an associated *t*-statistic of -19.48. Thus, on average, for every dollar per share of financial statement debt the market value of equity decreases by $0.90 per share. Separating out each firm's debt into lease (*LEASEDEBT*) and non-lease amounts (*DEBT*), the coefficient on lease debt equals -1.04 (*t*-statistic = -14.35) as compared to the coefficient on non-lease debt of -0.86 (*t*-statistic = -17.42). These parameter estimates are significantly different from each other at the five percent significance level. Disaggregating capital lease debt (*CAPLEASL*) from long-term debt and the as-if capitalized operating lease liability (*NONCAPLEASL*) results in parameter estimates that are significantly different from each other at the five percent significance level. Referring to Table 7, the parameter estimate on *CAPLEASL* equals -2.03 (*t*-statistic = -6.25) contrasted with the parameter estimate of -0.88 (*t*-statistic = -19.21) for *NONCAPLEASL*.

With the as-if capitalized operating lease asset and liability included in *BVE*, I can assess whether equity investors price capital lease liabilities and long-term debt the same. Combined, the parameter estimate for *NONOPLEASL* equals -0.88 (*t*-statistic = -15.92). When capital lease liabilities are disaggregated from long-term debt, the result is a parameter estimate of -2.08 (*t*-statistic = -6.17) for *CAPLEASL* and a coefficient of -0.87 (*t*-statistic = -16.20) for long-term debt (*DEBT*) suggesting that equity investors utilize footnote disclosures to price capital lease liabilities and long-term debt differently.[21] These variables are significantly different from each other at the significance level of five percent. Solely separating out the as-if capitalized operating lease liability (*OPLEASL*) results in a parameter estimate of -1.02 (*t*-statistic = -12.79).

Turning to the focal point of the study, consider the model specification from equation three presented in the final column. In this specification, all three debt variables are disaggregated. The parameter estimate for capital lease liabilities (*CAPLEASL*) equals -1.86 (*t*-statistic -5.31). *DEBT* has a coefficient of -0.86 (*t*-statistic = -17.26). Additionally, the parameter estimate for the as-if capitalized operating lease liability (*OPLEASL*) is -0.95 (*t*-statistic = -13.31). Using a Chi-Square distribution with White-corrected standard errors, the probability that *OPLEASL* and *CAPLEASL* are equal is 1.70 percent. Also, the probability that *DEBT* and *CAPLEASL* are equal is 0.32 percent. Lastly, the probability that *DEBT* and *OPLEASL* are equal is 26.59 percent signifying that equity investors view long-term debt and as-if capitalized operating lease liabilities as economically similar on average.

Given the empirical findings, I find evidence consistent with equity market participants viewing capital lease liabilities and the as-if capitalized operating lease liability as economic

[21] It should be noted that some capital lease intensive firms report capital lease assets and/or capital lease liabilities on the balance sheet disaggregated from property, plant, and equipment and long-term debt, respectively.

liabilities of the firm similar to long-term debt. As limited as the current operating lease disclosures may be, it appears that investors, in addition to pricing the recognized capital lease liabilities, deem the operating lease disclosures adequately relevant and reliable to be impounded in price. The results also provide empirical evidence that capital lease liabilities and the as-if capitalized operating lease liabilities are priced differently. Thus, as standard setters contemplate whether and how best to revisit SFAS 13, they should consider the potential harm of aggregating data. Continuing to require lease disclosures by different lease classifications would assure that equity investors do not suffer from a loss of value relevant information in order to price leases.

### *5.1 Robustness Tests*

The results presented in Table 7 provide evidence consistent with operating and capital leases being priced differently by equity investors. As a robustness test, I examine whether firms with capital leases are fundamentally different than firms without capital leases. Table 8 presents descriptive statistics for regression variables by dividing the sample based on whether *CAPLEASL* is positive or equal to zero. Of the 9,985 firm-year observations in the main sample, 3,384 firm-year observations represent firms with capital leases and 6,601 observations represent firms that not. Comparing the means in each subsample, the differences in means of the regression variables are statistically insignificant. In order to evaluate whether firms with capital leases price operating leases differently than firms without capital leases, I create a categorical variable *CAPOP* that is equal to one if *CAPLEASL* is positive and zero otherwise. Additionally, *CAPOPEASL* is an interaction variable equal to *CAPOP***OPLEASL*. The regression results are presented in column one of Table 9. The coefficient on the variable *CAPOPLEASL* equals -0.22 with a statistically

insignificant *t*-statistic of -1.67. However, the probability that operating and capital leases are priced the same for firms with both operating and capital leases increases to 10.48 percent.

As a second robustness test, I examine the pricing of operating and capital leases for the transportation industry (SIC = 4), the most lease-intensive industry. Results for the most part mirror the main sample. The probability that operating and capital leases are priced the same equals 1.98 percent. The third robustness test is motivated by FIN 46. Already-existing synthetic lease transactions were subject to the revised consolidation rules under FIN 46 beginning at the end of 2003. In the third column, I evaluate my model specification for the first three years of the sample period from 2000 through 2002. Again, the results for this third robustness test in column three are similar to the column one results. The probability that operating and capital leases are priced the same equals 0.43 percent. The coefficient on *CAPOPLEASL* equals -0.18 with a statistically insignificant *t*-statistic of -1.15. The associated probability that operating and capital leases are priced the same by firms with both leases equals 2.33 percent. Comparing the results from sample period with and without 2003, firm-year observations from 2003 increased the probability from 2.33 percent to 10.48 percent that operating and capital leases are priced the same by firms with both operating and capital leases. Thus, it appears that future research could evaluate how FIN 46 affected the pricing of operating and capital leases.

# CHAPTER 6

# CONCLUSION

The vast majority of leasing activity by publicly traded U.S. firms escapes capitalization under Generally Accepted Accounting Principles. In the wake of the alleged corporate accounting abuses the past several years, off-balance sheet financing, including operating lease accounting under SFAS 13, has come under increased scrutiny. Congress passed the Sarbanes-Oxley Act in the summer of 2002, which mandated the SEC to evaluate and report on the extent of off-balance sheet financing. In its report dated June 15, 2005, the SEC recommended that the FASB reconsider SFAS 13, concluding that they believe "that the potential benefits in terms of increased transparency of financial reporting would be substantial enough to justify the time and effort required."

As standard setters assess whether to re-evaluate SFAS 13 and the lease capitalization criteria, they do so without the benefit of empirical research examining whether capital market participants find the current leasing disclosure value relevant. The purpose of this paper is to help fill that void by documenting the value relevance of capital lease liabilities and current operating lease disclosures.

The results show a negative, significant relation between capital lease liabilities and the market value of equity. In addition, I construct an as-if capitalized operating lease liability and examine the relation between operating lease activity and market value. The results show a negative, significant relation between operating lease activity and the market value of

equity consistent with equity investors viewing as-if capitalized operating lease liabilities and capital lease liabilities as true economic liabilities of the firm. Moreover, the results provide evidence that current lease disclosures, as limited as they may be, supply sufficiently relevant and reliable information to be impounded into price by investors. The results also show that equity investors price operating and capital lease liabilities differently. Thus, should the FASB require the capitalization of all leases, separate (and hopefully enhanced) leasing disclosures by lease classification would assure that equity investors do not suffer from a loss of valuation relevant information in the pricing of leases.

## Appendix:

## Review of Lease Capitalization Criteria

A capital lease is defined as any noncancelable lease meeting one or more of the following four bright-line tests (SFAS 13 paragraphs 6-7):

1. Transfer of Ownership. The lease transfers ownership to the lessee by the end of the lease term.

2. Bargain Purchase Option. The lease contains a bargain purchase option. Specifically, a bargain purchase option is defined as the lessee having the option to purchase leased property for a price sufficiently lower than the expected fair value of the property on the date the option vests such that exercise of the option is reasonably assured.

3. 75 Percent of Economic Life. The lease term equals or exceeds 75 percent of the estimated economic life of the leased property.

4. 90 Percent of Asset's Value. The present value at the beginning of the lease term of the minimum lease payments to be paid to the lessor equals or exceeds 90 percent of the leased asset's value to the lessor at the inception of the lease.

Capital leases are capitalized using the lower of the lessee's incremental borrowing rate or the lessor's rate of return on the lease if known. In addition, leased assets that are classified as capital leases because they meet the transfer of ownership or bargain purchase option criteria are depreciated over the useful life of the asset whereas leased assets that are classified as capital leases because they meet the 75 percent of economic life or 90 percent of asset value criteria are depreciated over the life of the lease term.

Leases that are not capitalized under SFAS 13 are classified as operating leases, resulting in an annual rental expense in the year incurred and disclosure of the rental commitments in

the notes to the financial statements. Operating lease disclosures summarize the rental commitments or amounts to be paid out in one to five years followed by a lump sum amount which aggregates the rental commitments beyond five years. Thus, by obtaining operating lease treatment and assuming the underlying economic need for constant or increasing lease activity, performance and leverage ratios can be enhanced. A brief example of operating and capital lease accounting follows.

Consider a lease agreement consummated at the end of year 0 that consists of five annual payments of $10,000 at the end of each year. Assume the appropriate discount rate is 10 percent. Detailed below are the journal entries for both an operating lease and a capital lease over the lease term, assuming straight line depreciation.

| | Operating Lease | | | Capital Lease | | |
|---|---|---|---|---|---|---|
| Year 0 | No Entry | | | Capital Lease Asset | 37,908 | |
| | | | | Capital Lease Liab. | | 37,908 |
| Year 1 | Rent Expense | 10,000 | | Depreciation Expense | 7,582 | |
| | Cash | | 10,000 | Interest Expense | 3,791 | |
| | | | | Capital Lease Liab. | 6,209 | |
| | | | | Accumulated Dep. | | 7,582 |
| | | | | Cash | | 10,000 |
| Year 2 | Rent Expense | 10,000 | | Depreciation Expense | 7,582 | |
| | Cash | | 10,000 | Interest Expense | 3,170 | |
| | | | | Capital Lease Liab. | 6,830 | |
| | | | | Accumulated Dep. | | 7,582 |
| | | | | Cash | | 10,000 |
| Year 3 | Rent Expense | 10,000 | | Depreciation Expense | 7,582 | |
| | Cash | | 10,000 | Interest Expense | 2,487 | |
| | | | | Capital Lease Liab. | 7,513 | |
| | | | | Accumulated Dep. | | 7,582 |
| | | | | Cash | | 10,000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Year 4 | Rent Expense | 10,000 | | Depreciation Expense | 7,581 | |
| | Cash | | 10,000 | Interest Expense | 1,736 | |
| | | | | Capital Lease Liab. | 8,264 | |
| | | | | Accumulated Dep. | | 7,581 |
| | | | | Cash | | 10,000 |
| Year 5 | Rent Expense | 10,000 | | Depreciation Expense | 7,581 | |
| | Cash | | 10,000 | Interest Expense | 909 | |
| | | | | Capital Lease Liab. | 9,091 | |
| | | | | Accumulated Dep. | | 7,581 |
| | | | | Cash | | 10,000 |

**Table 1:**

**Estimation of The Operating Lease Asset and Liability**

**Panel A: Hand-collected Sample Selection Criteria**

| | | |
|---|---|---|
| Compustat firms in 2001 and 2002 with more than $25M in capital lease obligations | | 613 |
| Less the following firm-year observations: | | |
| American Depository Receipts/Foreign Firms | 199 | |
| Utilities (Electric and Natural Gas) | 55 | |
| Missing Shares Outstanding or Share Price Data | 44 | |
| Real Estate Investment Trusts | 10 | |
| Insurance Companies | 9 | |
| Missing Capital Asset Data in the Form 10-K | 77 | |
| Missing Capital Asset Accumulated Depreciation Data | 28 | |
| Missing Rental Commitment Amounts | 17 | |
| Negative Shareholder's Equity Balances | 20 | |
| Influential Observations - Belsley, Kuh, and Welsch (1980) | 6 | 465 |
| **Total Firm-Year Observations in Subsample** | | **148** |

**Panel B: Calibration of the Estimated As-if Capitalized Operating Lease Liability**

| **Capital Lease Liability** | **N** | **Mean** | **St. Dev.** | **10%** | **Median** | **90%** |
|---|---|---|---|---|---|---|
| Reported | 148 | 208.88 | 457.16 | 31.76 | 63.88 | 466.76 |
| Estimated* | 148 | 211.09 | 482.39 | 30.67 | 61.30 | 486.91 |

* The estimated capital lease liability distribution reflects the as-if capitalized operating lease liability methodology applied to hand-collected capital lease amounts of the same variables.

**Table 1:**

**Estimation of The Operating Lease Asset and Liability**

**Panel C: Total Rental Commitments by Disclosed Lease Classification Categories**

| | N | Operating Leases | | Capital Leases | |
|---|---|---|---|---|---|
| | | Amount ($M) | Percentage | Amount ($M) | Percentage |
| Year 1 | 148 | 33,274 | 9.55% | 5,620 | 11.00% |
| Year 2 | 148 | 30,753 | 8.83% | 5,198 | 10.18% |
| Year 3 | 148 | 28,829 | 8.28% | 4,671 | 9.15% |
| Year 4 | 148 | 27,025 | 7.76% | 4,065 | 7.96% |
| Year 5 | 148 | 24,852 | 7.13% | 3,606 | 7.06% |
| Lump Sum Amount | 148 | 203,612 | 58.45% | 27,917 | 54.66% |
| Total Rental Commitments | 148 | 348,345 | 100.00% | 51,077 | 100.00% |

**Panel D: Estimation of the Operating Lease Asset with Capital Lease Data**

$$CAPLEASA_{it} = \beta_0 + \beta_1 CLRC1_{it} + \beta_2 CLRC2_{it} + \beta_3 CLRC3_{it} + \beta_4 CLRC4_{it} + \beta_5 CLRC5_{it} + \beta_6 CLRCLS_{it} + e_{it} \quad [1]$$

| ***Variables*** | **Coefficient** | ***t*-statistic** |
|---|---|---|
| *Intercept* | -11.8789 | -2.02 |
| *CLRC1* | -0.4659 | -0.92 |
| *CLRC2* | 1.3633 | 2.31 |
| *CLRC3* | 0.4079 | 0.58 |
| *CLRC4* | 0.7441 | 0.74 |
| *CLRC5* | 5.4924 | 6.55 |
| *CLRCLS* | 0.0136 | 0.33 |
| $R^2$ | | 0.9846 |
| Observations | | 148 |

*CLRCi* = capital lease rental commitments in years 1 through 5 for firm i at time t

CLRCLS = the capital lease rental commitment lump sum amount beyond year 5 for firm i at time t

*CAPLEASA* = the net book value of capital lease assets for firm i at time t

**Table 2:**
**Sample Selection Criteria and Industry and Year Sample Representation**

**Panel A: Sample Selection Criteria**

| | | |
|---|---|---|
| Compustat firm-year observations in years 2000 through 2003 with positive net sales revenue and $10 million or more in total assets | | 24,578 |
| Less the following firm-year observations: | | |
| American Depository Receipts/Foreign Firms | 3,832 | |
| Real Estate Investment Trusts | 828 | |
| Utilities (Electric and Natural Gas) | 663 | |
| Insurance Companies | 509 | |
| Financial Institutions | 336 | |
| Missing Shares Outstanding Data | 1,217 | |
| Missing Share Price Data | 1,023 | |
| Missing Operating Lease Rental Commitment Amount Data | 4,227 | |
| Missing Capital Lease Obligation Data | 528 | |
| Missing Long-term Debt Data | 6 | |
| Negative Shareholder's Equity Balances | 648 | |
| Missing One-year Ahead Sales Revenue Data (*GROWTH*) | 357 | |
| Missing Marginal Tax Rate Data | 351 | |
| Influential Observations - Belsley, Kuh, and Welsch (1980) | 68 | 14,593 |
| **Total Firm-Year Observations in Sample** | | **9,985** |

**Panel B: Industry and Year Sample Representation**

| Year | N | Percentage |
|---|---|---|
| 2000 | 2,452 | 24.56% |
| 2001 | 2,522 | 25.26% |
| 2002 | 2,553 | 25.57% |
| 2003 | 2,458 | 24.62% |
| Total | 9,985 | 100.00% |

| SIC Code | N | Percentage |
|---|---|---|
| 0 | 32 | 0.32% |
| 1 | 526 | 5.27% |
| 2 | 1,733 | 17.36% |
| 3 | 3,167 | 31.72% |
| 4 | 600 | 6.01% |
| 5 | 1,402 | 14.04% |
| 6 | 422 | 4.23% |
| 7 | 1,537 | 15.39% |
| 8 | 529 | 5.30% |
| 9 | 37 | 0.37% |
| Total | 9,985 | 100.00% |

**Table 3:**
**Sample and Compustat Industry Concentration**

**Observations by Industry**

| SIC | Industries | Compustat N | Compustat Percentage | Sample N | Sample Percentage | Sample Op. Lease Mean ($M) | Sample Cap Lease Mean ($M) |
|---|---|---|---|---|---|---|---|
| 0 | Agriculture | 97 | 0.39% | 32 | 0.32% | 86.88 | 2.06 |
| 1 | Mining/Construction | 1,370 | 5.57% | 526 | 5.27% | 44.70 | 2.07 |
| 2 | Food/Chemicals | 3,776 | 15.36% | 1,733 | 17.36% | 79.36 | 4.56 |
| 3 | Manufacturing | 6,394 | 26.02% | 3,167 | 31.72% | 49.10 | 3.03 |
| 4 | Transportation | 2,784 | 11.33% | 600 | 6.01% | 479.63 | 60.97 |
| 5 | Wholesale/Retail | 2,625 | 10.68% | 1,402 | 14.04% | 315.53 | 25.30 |
| 6 | Finance/Insurance/Real Estate | 2,818 | 11.47% | 422 | 4.23% | 160.49 | 4.38 |
| 7 | Services | 3,582 | 14.57% | 1,537 | 15.39% | 88.52 | 3.22 |
| 8 | Services | 1,028 | 4.18% | 529 | 5.30% | 59.48 | 3.16 |
| 9 | Administration | 104 | 0.42% | 37 | 0.37% | 760.17 | 4.20 |
| | Whole Sample | 24,578 | 100.00% | 9,985 | 100.00% | 131.48 | 9.95 |

This table illustrates the industry representation in the sample compared to the Compustat database. The Compustat sample consists of firm-year observations from years 2000 through 2003 that have positive net sales revenue and $10 million or more in total assets . See Table 2 for the sample selection criteria that resulted in the final sample in the paper. As-if capitalized operating lease and capital lease mean liabilities are presented by one-digit SIC codes for the sample.

**Table 4:**
**Balance Sheet and Financial Statement Ratio Effects of Capitalizing Operating Leases**

Aggregated Wholesale and Retail Sample Firms In Year 2003 (SIC = 5, n = 349)
Balance Sheet
Last Day of 2003 Fiscal-Year

| | | | | |
|---|---|---|---|---|
| Reported Total Assets | 604,210 | Reported Total Liabilities | 350,093 | |
| Operating Lease Assets | 112,818 | Operating Lease Liabilities | 121,033 | |
| Operating Lease Tax Adjustment | 2,731 | | | |
| | | **Adjusted Total Liabilities** | **471,126** | |
| | | Reported Stockholder's Equity | 254,117 | |
| | | Reported Net Income in SE | 33,453 | * |
| | | Reduction in Stockholder's Equity From Operating Leases | (5,484) | * |
| | | **Adjusted Stockholder's Equity** | **248,633** | |
| **Adjusted Total Assets** | **719,759** | **Adjusted Total Liabilities and Stockholder's Liabilities** | **719,759** | |

| Aggregated Sample Ratios | Reported Amounts** | Adjusted Amounts |
|---|---|---|
| **ROA** | 5.54% | 4.65% |
| **ROE** | 13.16% | 13.45% |
| **Debt-to-Asset** | 57.94% | 65.46% |
| **Debt-to-Equity** | 137.77% | 189.49% |

* I assume in computing ratios for this example that all net income effects take place in prior years. The operating lease tax adjustment reflects reduced income taxes (computed using the firm-specific marginal tax rate) attributable to depreciation and interest expense amounts that exceed lease expense amounts.
** The simplified ratios have the following definitions: ROA = Net Income/Total Assets
ROE = Net Income/Total Equity D/A = Total Liabilities/Total Assets D/E = Total Debt/Total Equity

**Table 5:**
**Descriptive Statistics of Regression Variables**

| Variables | N | Mean | St. Dev. | 10 Percent | Median | 90 Percent |
|---|---|---|---|---|---|---|
| Regression Variables: | | | | | | |
| *MVE* | 9,985 | 14.67 | 14.54 | 1.49 | 10.14 | 34.05 |
| *CONSTANT* | 9,985 | 0.08 | 0.15 | 0.01 | 0.04 | 0.19 |
| *BVE* | 9,985 | 13.45 | 20.26 | 0.48 | 8.15 | 30.60 |
| *NI* | 9,985 | -0.36 | 19.72 | -1.77 | 0.21 | 1.80 |
| *NEG* | 9,985 | 0.40 | 0.49 | 0.00 | 0.00 | 1.00 |
| *NEGNI* | 9,985 | -1.07 | 19.57 | -1.77 | 0.00 | 0.00 |
| *CAPLEASL* | 9,985 | 0.12 | 0.92 | 0.00 | 0.00 | 0.16 |
| *DEBT* | 9,985 | 4.85 | 11.87 | 0.00 | 1.00 | 12.72 |
| *OPLEASL* | 9,985 | 1.85 | 5.65 | 0.06 | 0.51 | 4.03 |
| *GROWTH* | 9,985 | 21.63 | 35.75 | 1.00 | 10.81 | 50.58 |
| Variables Used to Compute Regression Variables: | | | | | | |
| *OLRC1* | 9,985 | 0.42 | 1.01 | 0.02 | 0.15 | 1.01 |
| *OLRC2* | 9,985 | 0.37 | 0.97 | 0.02 | 0.12 | 0.87 |
| *OLRC3* | 9,985 | 0.32 | 0.89 | 0.01 | 0.10 | 0.74 |
| *OLRC4* | 9,985 | 0.27 | 0.83 | 0.00 | 0.07 | 0.62 |
| *OLRC5* | 9,985 | 0.24 | 0.86 | 0.00 | 0.06 | 0.51 |
| *OLRCLS* | 9,985 | 1.24 | 6.82 | 0.00 | 0.10 | 2.13 |
| *Discount Rate* | 9,985 | 0.089 | 0.071 | 0.038 | 0.073 | 0.152 |
| *OPLEASA* | 9,985 | 1.51 | 6.19 | 0.00 | 0.02 | 3.50 |
| *Stockholder's Equity* | 9,985 | 7.45 | 8.18 | 0.93 | 5.39 | 16.08 |
| *MTR* | 9,985 | 0.243 | 0.130 | 0.021 | 0.329 | 0.350 |

**Table 5:**
**Descriptive Statistics of Regression Variables**

Variable Definitions:

*MVE* = market value of common equity three months after the fiscal year-end
*CONSTANT* = one divided by common shares outstanding
*BVE* = book value of total stockholder's equity increased by *CAPLEASL* , *DEBT* , *OPLEASA,* and the deferred tax asset from capitalizing operating leases *(OPLEASL - OPLEASA)*MTR*
*NI* = net income after extraordinary and discontinued items (Compustat data item 172)
*NEG* = categorical variable equal to one if *NI* is negative and zero otherwise
*NEGNI* = interaction variable equal to *NI*NEG*
*CAPLEASL* = capital lease obligations (Compustat data item 84)
*DEBT* = long-term debt less *CAPLEASL*
*OPLEASL* = estimated as-if capitalized operating lease liability
*GROWTH* = one-year ahead actual total net sales (Compustat data item 12)
*OLRCi* = operating lease rental commitment in years 1, 2, 3, 4, or 5 (Compustat data items 96,164-167)
*OLRCLS* = operating lease rental commitment lump sum amount beyond year 5 (Compustat data item 389)
*Discount Rate* = the estimated firm-specific discount rate
*OPLEASA* = estimated as-if capitalized operating lease asset
*Stockholder's Equity* = total stockholder's equity (Compustat data item 216)
*MTR* = the computed firm specific marginal tax rate (Graham 1996)

All variables are deflated by common shares outstanding. All dollar amounts are in millions.

**Table 6:**
**Pearson and Spearman Correlation Coefficients**

| *Variables* | *MVE* | *BVE* | *NI* | *NEGNI* | *CAPLEASL* | *DEBT* | *OPLEASL* | *GROWTH* |
|---|---|---|---|---|---|---|---|---|
| *MVE* | 1.0000 | 0.6005 | 0.5588 | 0.3898 | -0.0601 | 0.3106 | 0.3112 | 0.4550 |
| *BVE* | 0.4257 | 1.0000 | 0.3790 | 0.2067 | 0.1027 | 0.7195 | 0.6377 | 0.7386 |
| *NI* | -0.1294 | -0.1770 | 1.0000 | 0.8879 | -0.0543 | 0.2601 | 0.1951 | 0.4621 |
| *NEGNI* | -0.1614 | -0.2032 | 0.9943 | 1.0000 | -0.0708 | 0.1454 | 0.0906 | 0.3359 |
| *CAPLEASL* | 0.0288 | 0.3795 | -0.0287 | -0.0322 | 1.0000 | 0.1160 | 0.1853 | 0.0977 |
| *DEBT* | 0.2555 | 0.8537 | -0.1922 | -0.2098 | 0.1884 | 1.0000 | 0.4152 | 0.5881 |
| *OPLEASL* | 0.1199 | 0.6121 | -0.1182 | -0.1275 | 0.5053 | 0.3010 | 1.0000 | 0.6528 |
| *GROWTH* | 0.2809 | 0.5242 | **0.0022** | **-0.0187** | 0.2234 | 0.3905 | 0.3860 | 1.0000 |

Pearson (Spearman) correlation coefficients are presented under (over) the diagonal for variables in the regression model specification. Correlation coefficients are significantly different from zero at the significance level of five percent unless they are bolded. See Table 5 for variable definitions.

**Table 7:**
**Value Relevance of Operating and Capital Lease Liabilities**

$$MVE_{it} = \beta_0 CONSTANT_{it} + \beta_1 BVE_{it} + \beta_2 NI_{it} + \beta_3 NEG_{it} + \beta_4 NEGNI_{it} + \beta_5 CAPLEASL_{it} + \beta_6 DEBT_{it} + \beta_7 OPLEASL_{it} + \beta_8 GROWTH_{it} + \beta_9 \Sigma YEAR_{it} + \beta_{10} \Sigma INDUSTRY_{it} + e_{it} \quad (3)$$

| *Variables* | | Coefficient<br>*t-statistic* | Coefficient<br>*t-statistic* | Coefficient<br>*t-statistic* | Coefficient<br>*t-statistic* | Coefficient<br>*t-statistic* | Coefficient<br>*t-statistic* | Coefficient<br>*t-statistic* | |
|---|---|---|---|---|---|---|---|---|---|
| *CONSTANT* | ? | -7.15 | -6.92 | -6.94 | -15.18 | -15.06 | -15.08 | -6.87 | |
| | | *-2.51* | *-2.44* | *-2.44* | *-5.79* | *-5.79* | *-5.79* | *-2.43* | |
| *BVE* | + | 0.86 | 0.86 | 0.86 | 0.85 | 0.87 | 0.87 | 0.86 | |
| | | *19.43* | *20.73* | *19.83* | *17.02* | *18.30* | *20.41* | *20.35* | |
| *NI* | + | 0.53 | 0.51 | 0.51 | 0.52 | 0.50 | 0.51 | 0.51 | |
| | | *2.50* | *2.50* | *2.47* | *2.49* | *2.47* | *2.49* | *2.47* | |
| *NEG* | ? | -6.75 | -6.71 | -6.69 | -6.71 | -6.61 | -6.64 | -6.68 | |
| | | *-24.19* | *-24.79* | *-24.14* | *-23.57* | *-23.63* | *-24.61* | *-24.32* | |
| *NEGNI* | - | -0.63 | -0.62 | -0.61 | -0.62 | -0.61 | -0.61 | -0.61 | |
| | | *-2.98* | *-2.99* | *-2.95* | *-2.98* | *-2.97* | *-3.00* | *-2.96* | |
| *ALLDEBT* | - | -0.90 | | | | | | | |
| | | *-19.48* | | | | | | | |
| *LEASEDEBT* | - | | -1.04 | | | | | | |
| | | | *-14.35* | | | | | | |
| *NONCAPLEASL* | - | | | -0.88 | | | | | |
| | | | | *-19.21* | | | | | |
| *NONOPLEASL* | - | | | | -0.88 | | | | |
| | | | | | *-15.92* | | | | |
| *CAPLEASL* | - | | | -2.03 | | -2.08 | | **-1.86** | * |
| | | | | *-6.25* | | *-6.17* | | *-5.31* | |
| *DEBT* | - | | -0.86 | | | -0.87 | | **-0.86** | * |
| | | | *-17.42* | | | *-16.20* | | *-17.26* | |
| *OPLEASL* | - | | | | | | -1.02 | **-0.95** | * |
| | | | | | | | *-12.79* | *-13.31* | |
| *GROWTH* | + | 0.02 | 0.03 | 0.03 | 0.02 | 0.03 | 0.03 | 0.03 | |
| | | *3.87* | *4.18* | *4.08* | *3.87* | *4.56* | *4.15* | *4.15* | |
| $R^2$ | | 0.7247 | 0.7262 | 0.7269 | 0.7259 | 0.7286 | 0.7274 | 0.7272 | |
| Observations | | 9,985 | 9,985 | 9,985 | 9,985 | 9,985 | 9,985 | 9,985 | |

**Table 7:**
**Value Relevance of Operating and Capital Lease Liabilities**

* Using a Chi-Square distribution with White-corrected standard errors, the probability that *OPLEASL* and *CAPLEASL* are equal is 1.70 percent, the probability that *DEBT* and *CAPLEASL* are equal is 0.32 percent, and the probability that *DEBT* and *OPLEASL* are equal is 26.59 percent.

Fixed-year and fixed-industry effects are included in the model but not reported. See Table 5 for variable definitions included in equation three. Additional variables with tabulated regression results are defined as follows:

*ALLDEBT* = long-term debt *(DEBT)* plus capital lease obligations *(CAPLEASL)* plus the as-if capitalized operating lease liability (*OPLEASL* )
*LEASEDEBT* = capital lease obligations *(CAPLEASL)* plus the as-if capitalized operating lease liability
*NONCAPLEASL* = long-term debt *(DEBT)* plus the as-if capitalized operating lease liability *(OPLEASL)*
*NONOPLEASL* = long-term debt *(DEBT)* plus capital lease obligations *(CAPLEASL)*

Where necessary, I recompute the *BVE* variable to account for varying levels of disaggregation.

**Table 8:**
**Descriptive Statistics of Regression Variables Based on Capital Lease Activity**

| Variables | N | Mean | St. Dev. | 10 Percent | Median | 90 Percent |
|---|---|---|---|---|---|---|
| Regression Variables: | | | | | | |
| *MVE* | 3,384 | 13.93 | 15.27 | 1.24 | 8.95 | 33.50 |
| *MVE* | 6,601 | 15.05 | 14.13 | 1.65 | 10.82 | 34.30 |
| *BVE* | 3,384 | 15.31 | 24.51 | 0.45 | 8.63 | 34.28 |
| *BVE* | 6,601 | 12.49 | 17.62 | 0.51 | 7.96 | 28.50 |
| *NI* | 3,384 | -1.27 | 33.53 | -2.23 | 0.09 | 1.76 |
| *NI* | 6,601 | 0.11 | 3.36 | -1.55 | 0.26 | 1.82 |
| *NEG* | 3,384 | 0.45 | 0.50 | 0.00 | 0.00 | 1.00 |
| *NEG* | 6,601 | 0.38 | 0.49 | 0.00 | 0.00 | 1.00 |
| *NEGNI* | 3,384 | -1.95 | 33.42 | -2.22 | 0.00 | 0.00 |
| *NEGNI* | 6,601 | -0.62 | 2.49 | -1.55 | 0.00 | 0.00 |
| *CAPLEASL* | 3,384 | 0.36 | 1.56 | 0.002 | 0.05 | 0.69 |
| *CAPLEASL* | 6,601 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *DEBT* | 3,384 | 5.29 | 11.42 | 0.00 | 1.25 | 14.40 |
| *DEBT* | 6,601 | 4.63 | 12.09 | 0.00 | 0.86 | 11.66 |
| *OPLEASL* | 3,384 | 2.87 | 8.17 | 0.07 | 0.66 | 6.56 |
| *OPLEASL* | 6,601 | 1.33 | 3.65 | 0.05 | 0.44 | 3.04 |
| *GROWTH* | 3,384 | 24.61 | 43.06 | 0.93 | 11.19 | 61.90 |
| *GROWTH* | 6,601 | 20.10 | 31.23 | 1.04 | 10.67 | 47.43 |

This table presents descriptive statistics of the regression variables for two subsamples of data based on whether or not firms have capital leases (*CAPLEASL* ). Of the 9,985 firm-year observations identified in Table 2, 3,384 firm-year observations reflect capital lease activity (*CAPLEASL* > 0) and 6,601 firm-year observations do not. See variable definitions in Table 5. All variables are deflated by common shares outstanding. All dollar amounts are in millions. The differences in the means are statistically insignificant.

**Table 9:**
**Robustness Tests: Value Relevance of Operating and Capital Lease Liabilities**

$$MVE_{it} = \beta_0 CONSTANT_{it} + \beta_1 BVE_{it} + \beta_2 NI_{it} + \beta_3 NEG_{it} + \beta_4 NEGNI_{it} + \beta_5 CAPLEASL_{it} + \beta_6 DEBT_{it} + \beta_7 OPLEASL_{it} + \beta_8 CAPOP_{it} + \beta_9 CAPOPLEASL_{it} + \beta_{10} GROWTH_{it} + \beta_{11} \Sigma YEAR_{it} + \beta_{12} \Sigma INDUSTRY_{it} + e_{it}$$

| | | 1 | 2 | 3 |
|---|---|---|---|---|
| | | Coefficient | Coefficient | Coefficient |
| *Variables* | Prediction | *t-statistic* | *t-statistic* | *t-statistic* |
| *CONSTANT* | ? | -6.89 | 5.36 | -5.37 |
| | | *-2.44* | *0.70* | *-1.72* |
| *BVE* | + | 0.86 | 0.84 | 0.80 |
| | | *20.95* | *6.01* | *17.38* |
| *NI* | + | 0.50 | 0.18 | 0.99 |
| | | *2.47* | *0.45* | *2.78* |
| *NEG* | ? | -6.68 | -5.12 | -5.87 |
| | | *-24.43* | *-5.27* | *-15.55* |
| *NEGNI* | - | -0.61 | -0.16 | -1.10 |
| | | *-2.97* | *-0.33* | *-3.07* |
| *CAPLEASL* | - | -1.59 | -2.05 | -1.70 |
| | | *-4.86* | *-3.37* | *-5.18* |
| *DEBT* | - | -0.86 | -0.76 | -0.81 |
| | | *-17.64* | *-4.12* | *-15.55* |
| *OPLEASL* | - | -0.81 | -0.89 | -0.72 |
| | | *-6.22* | -6.07 | *-4.78* |
| *CAPOP* | ? | 0.10 | 3.67 | -0.05 |
| | | *0.35* | 3.84 | *-0.16* |
| *CAPOPLEASL* | ? | -0.22 | -0.19 | -0.18 |
| | | *-1.67* | -1.96 | *-1.15* |
| *GROWTH* | + | 0.03 | 0.08 | 0.02 |
| | | *4.22* | *3.25* | *3.31* |
| $R^2$ | | 0.7278 | 0.7085 | 0.7045 |
| Observations | | 9,985 | 600 | 7,527 |

*CAPOP* = a categorical variable equal to one if *CAPLEASL* is positive and zero otherwise
*CAPOPLEASL* = interaction variable equal to *CAPOP *OPLEASL*
Fixed-year and fixed-industry effects are included in the model but not reported. See Table 5 for variable definitions included in equation three.

This table presents regression results for three robustness tests. The first test in column one examines whether operating leases are priced similarly by firms with and without capital leases. In the second test, I evaluate whether leases for transportation firms, the most lease intensive industry (SIC = 5), are priced similarly to the main sample. Lastly, I assess in the third test whether leases are priced differently in the first three years of the sample period than in 2003.

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