

## Market Perceptions of Lease Liabilities

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### I. Introduction

Previous empirical studies have examined market's response to the deliberations surrounding and enactments of lease disclosure regulation and to the information content of the data disclosed as a result of the regulation. Given the empirical evidence that certain financial ratios are used by investors<sup>1)</sup>, it is reasonable to hypothesize that investors' assessment of the firm's risk return characteristics would be affected if non-capitalized lease data were made public and incorporated into the investors' evaluation of the firm's market value. However, the literature indicates that the test results are not consistent with each other. While Ro (1978) has found a market reaction to his PV-IE sample (i. e., the firms that disclosed both present values and income effect of lease obligations), no significant market reaction was observed for the PV-only sample (i. e., the firms with present value information only). Finnerty, Fitzsimmons, and Oliver (1980) have found no shifts in the systematic risks surrounding several announcements and concluded that the mandated lease information may have already been known to the market through other available sources. The result of Bowman (1980) also indicates that the information is impounded in the systematic risks of the disclosing firms well in advance (i. e., the required data are incorporated into the predisclosure systematic risks), which is consistent with a strong form of market efficiency.

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1) Lev(1974), Hamada(1972), Beaver, Kettler, and Scholes(1970), and Christie(1982).

With regard to the bond market's reaction, Abdel-khalik, Thompson, and Taylor (1978) concluded that the disclosure had no significant impact on the assessment of the risk of bond default and the bond market might have already reacted to the information content of the required data. However, their study indicates that the mean bond risk premiums (BRP's) of some firms that financed through non-capitalized leases were significantly lower than those of other firms of similar risk profile. Note that the results of Finnerty et al. (1980), Ro (1978, his PV-only sample), and Abdel-khalik et al. (1978) are also consistent with the hypothesis that the disclosed information has not been used by investors, thus no market reaction.

The conflicting results of the previous studies might be due to certain research design limitations. First, most studies used either a matched-pair design or control samples as an attempt to control for variables which are expected to affect the test results.<sup>2)</sup> It is probable that, as is typical in this type of research design, the mixed results may be due to imprecise matching. Other possibly important variables have not been adequately controlled for.<sup>3)</sup> For example, the adverse market reaction to the PV-IE sample firms in Ro (1978) could have been due to self-selection bias since those firms might have experienced poor earnings and therefore adopted a heavy use of off-balance sheet financing to avoid further reduction in earnings.<sup>4)</sup> The studies by Abdel-khalik et al. (1978) and Finnerty et al. (1980) also suffer from this limitation. The firms might have already reacted to the new disclosure regulations by changing their financing and investment plans. Thus, if attention is given only to the changes in risk measures over time without controlling for these activities, the test results might be misleading.

Second, the variables of interest investigated are mean return difference, bond risk premium (BRP), shifts in the systematic risks, and the systematic risk itself. As pointed out in Abdel-khalik et al. (1981), the result of no change in BRP's over time in Abdel-khalik et al. (1978) may be due to the

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2) The matching criteria are: the risk class and industrial classifications (Ro(1978)), industrial classifications (Finnerty et al.(1980)), and bond rating, coupon rate, and time to maturity (Abdel-khalik et al.(1978)).

3) Such as firm size, firm's profitability, and firm's financing and investing activities.

4) Of course, this is just a possibility, depending on the firm's depreciation policy.

nonavailability of clean data bank on bond transactions and the insufficient development in the models of the determinants of BRP. Also, it is quite probable that even if the newly disclosed non-capitalized lease information might have been used by investors, the return variable and the systematic risk are not sensitive enough to capture the changes in the financial leverage of a firm. Ohlson (1979) has shown that the expected price in a richer information environment is equal to the price in a less rich environment. It is also shown that while the market risks in the two different information environments would be identical, the variability of the price is larger in the finer information environment. Boness, Chen, and Jatusipitak (1974) have investigated the hypothesis that a change in a firm's capital structure causes a nonstationarity in the stock price changes. Their result indicates that changes in capital structure increases the riskiness of return on common stock, but only the portion of unsystematic risk. The hypothesis that systematic risk varies directly with leverage changes is rejected.

Third, the timing of the actual market reaction is hard to identify due to the various announcements surrounding the enactment of lease disclosure regulations such as proposals, exposure drafts, and public hearings. Most studies are subject to this limitation.

Fourth, Bowman (1980) has examined the association between the pre-disclosure systematic risk and the non-capitalized lease data per ASR-147 in his regression analysis. It is not clear, however, why he assumed a strong form of market efficiency *a priori*. It is possible that the lease variable was a proxy for certain variable which affected the pre-disclosure systematic risk. Also, if the lease variable is reflected in the pre-disclosure systematic risk, it should be able to explain the contemporaneous systematic risk.<sup>5)</sup>

The primary motivation of this study is to provide further insight into the economic consequences of lease disclosure regulations. Based on prior empirical evidence and theory that financial leverage of a firm alters the volatility of the return on equity as the market continuously evaluates the firm's

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5) He investigated the relationship by controlling for a multicollinearity problem. However, he used the coefficient on the debt variable of non-leasing sample to adjust for the effect of debt variable of leasing sample, which may not be tenable. In another attempt, the sample size was reduced, deleting some leasing firms. Thus, the result may not be generalizable.

prospective cash flows, this study investigates market's perception of lease liabilities, as reflected in the volatility of the return on equity of a firm. With respect to lease liabilities, two types are considered depending on disclosure methods: Capitalized lease obligations and Footnote-disclosed lease obligations.

This study consists of the following: section 2 discusses the historical perspective in the lease disclosure regulations. The development of test hypotheses are discussed in section 3 and the empirical tests are reported in section 4. Section 5 concludes the paper.

## II. Historical Perspective

Conventional accounting practice has followed an approach which, presumably on the grounds that a leasing contract is executory, does not recognize either the asset or the debt in the accounts. The experience of many companies in the Great Depression, however, caused some doubts about the adequacy of this approach. In the years following World War II, when long term leases became a popular method of obtaining access to the services of fixed assets with a relatively small initial outlay of cash, accountants have speculated as to the inadequacy of the conventional approach that omits significant data from financial statements.<sup>6)</sup> The growing importance of leasing as a financing device was recognized by the accounting profession as early as 1949, when the AICPA issued Accounting Research Bulletin (ARB) No.38, which was restated and revised as Chapter 14 of ARB No.43 in 1953. Despite the disclosure recommendations of this, no consistent pattern has emerged, and the extent of disclosure of pertinent information has often been inadequate. This situation caused the accounting research division of the AICPA to undertake a research study, Accounting Research Study (ARS) No.4, which proposed a balance sheet treatment of leases to the extent that leases give rise to property rights. Chapter 14 of ARB No.43 and ARS No.4 agree that leases which are clearly in substance purchases result in assets and

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6) A good example is the case of the Childs Co., which was mentioned on the 15th Annual Report of the SEC in 1949.

liabilities which should be recorded. However, they disagree with regard to leases which convey merely the right to use property in consideration of specified rental payments over a definite future period.

The APB Opinion No.5 (in 1964), extending the disclosure requirements of ARB No.43, required capitalization of those leases that are "clearly in substance installment purchases of property", which it essentially defined as those leases whose terms "result in the creation of a material equity in the property".

Since the adoption of APB Opinion No.5, the Board has observed some improvement in the disclosures of lease commitments by lessees. However, users of financial statements have stated that the disclosures under APB Opinion No.5 have not always provided all of the relevant information they believed to be important. In the mean time, the SEC also has issued a number of pronouncements, including Accounting Series Releases (ARS) No.147, which made mandatory the disclosure of the present value of certain lease commitments. In addition, it required disclosure of the impact on net income had "financing" leases been capitalized.

However, inconsistencies remained in lease accounting practices, since while some pronouncements took the concept of "the transfer of substantially all the benefits and risks of ownership" as a basis for determining whether a lease should be accounted for as a financing or sale or an operating lease in lessor's accounting, others required capitalization of those leases that are "clearly in substance installment purchases of property". Therefore, because of this divergence in both concept and criteria, a particular leasing transaction might be recorded as a sale or as a financing by the lessor and as an operating lease by the lessee.

In October 1973, in recognition of the inconsistencies in practice, FASB appointed a task force to provide counsel to the Board in preparing a Discussion Memorandum analyzing issues related to the subject. As a result, Statement of Financial Accounting Standard (SFAS) No.13 was issued in November 1976, to remove most of the conceptual differences in lease classification. The provisions of SFAS No.13 derive from the view that a lease that transfers substantially all of the benefits and risks incident to the ownership of property should be accounted for as the acquisition of an asset and the incurrence of an obligation by the lessee and as a sale or financing by

the lessor. All other leases should be accounted for as operating leases. The Board concluded that the disclosures under SFAS No.13 would provide information helpful to users of financial statements in assessing the financial condition and results of operations of lessees.<sup>7)</sup>

SFAS No.13 was effective for leasing transactions and revisions entered into on or after January 1, 1977. Retroactive restatement was required for the financial statements for calendar or fiscal years beginning after December 31, 1980. The 4-year transition period was established so that firms could accumulate necessary data to meet the new regulation, and to resolve possible problems with regard to the restrictions on loan indentures. During the transition period, separate disclosure is required of the information on the amount of the asset and the liability that would have been included in the balance sheet had the leases that met the criteria for capitalization been accounted for in accordance with the provisions of SFAS No.13. Firms were required to disclose separately the effect on net income that would have resulted from the application of SFAS No.13. Also, at least one full year was given for companies to collect information for the interim disclosure.

### III. Development of Test Hypotheses

Leasing activities of a firm may be motivated by several factors. If we also consider a reporting regulation which allows different disclosure methods for the same lease liability, the question becomes more complicated. When one views the capitalization of lease commitments as a mere shift of information from the footnotes (FN-Lease, hereafter) to the body of the balance sheet (BS-Lease hereafter), there exist several economic factors which would render the BS-Lease contract and the FN-Lease contract different even if the underlying assets are the same. First, it is probable that managers believe

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7) If at the inception a lease meets one or more of the following conditions, it should be classified as a capital lease by the lessee. Otherwise, it should be classified as an operating lease. a) The lease transfers ownership of the property to the lessee by the end of the lease term. b) The lease contains a bargain purchase option. c) The lease term is equal to 75% or more of the estimated economic life of the leased property. d) The present value at the beginning of the lease term of the minimum lease payments equals or exceeds 90% of the fair value of the leased property.

that users of financial statements evaluate the financial risk of the firm by the debt-equity ratio reported on the balance sheet and therefore, being concerned with raising capital from the market, they will be motivated to employ FN-Leases than BS-Leases to suppress an increase in the financial risk measure.

Second, when loan indentures of a firm contain some restrictions stated in terms of accounting numbers such as debt-equity ratio, managers of the firm would prefer FN-Lease contract to BS-Lease contract since they may be able to undertake some new positive net present value projects which may not be undertaken if the measurement rules in the covenants are changed and the restrictions are violated.

Third, management compensation plans can also create incentives for FN-Lease contracts under different disclosure methods. If the management compensation plan of a firm depends on accounting measurement rules such as return on invested capital, BS-Lease contracts would increase the denominator of the ratio, thus producing a poorer performance measure of the management. Through FN-Lease contracts, the lease obligation can be hidden in footnotes and thus not counted as a part of the invested capital and the performance measure would not be affected. Therefore, *ceteris paribus*, managers would prefer FN-Lease contracts to maximize their own expected utility.

Fourth, managers may prefer FN-Lease contracts in order to preserve the degrees of freedom associated with asset and equity structure of the firm. Note that BS-Lease contracts would increase firms' long-term assets and debt-equity ratios and the firms' working capital positions will be worsened due to the current portion of the future lease payments. Therefore, from a reporting standpoint, FN-Lease contracts provide managers with flexibilities associated with the manipulation of reported income as well as asset structure of the firm.<sup>8)</sup>

Users of financial statements have shown a strong desire for more disclos-

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8) The income effect of the lease capitalization, however, may not be generalized in its direction since it depends on the amortization policy and the growth pattern of leasing activities of a firm. Thus, the major impact of the lease capitalization rests on balance sheet side and the direction of the effect will be uniform across firms.

ure of information concerning lease transactions by lessees. In order to help users of financial statements assess the financial condition and results of operation of lessees, FASB adopted SFAS No.13 under which more restrictive capitalization criteria are imposed. The essential impact of SFAS No.13 on the financial statements of lessee firms is the capitalization of lease information previously reported in footnotes, thus resulting in changes in assets structure as well as in capital structure.

The implicit assumption in the development of the regulation is that the non-capitalized lease liability may 'mislead' investors in assessing the financial structure of lessee firms. This concern over the 'Off-balance Sheet-Financing' stemmed from the possibility that investors may not 'see through' the different reporting methods which report essentially the same economic events. However, if the capital market is efficient in the sense that the 'real' financial leverage is assessed from whatever publicly available sources, the perception by investors of the lease information should be independent of different disclosure methods since the economic reality of the firm does not change. Therefore, the beliefs of rational investors about the distribution of the firm's future payoffs should not be affected by the packaging of information.

Therefore, from the discussions above, one hypothesis is that the management of a firm prefers FN-Leases to BS-Leases since the measurement rules specified in the bond covenants and the management compensation plans are not affected by FN-Leases (Incentive Effect). This would be so even under the 'informationally efficient' capital market. El-Gazzar, Lilien, and Pastena (1986) have found that financial contracting and management bonus incentive schemes help explain the management's choices of disclosure methods with respect to the lease accounting. Another important hypothesis is that the market may be misled by the different reporting methods which report essentially the same economic events (Functional Fixation). It should be noted that this functional fixation will also motivate the management of a firm to prefer FN-Lease even in the absence of the Incentive Effect. Suppose that a firm is experiencing a relatively high level of volatility in the return on equity due to, say, high debt-equity ratio. If the management of the firm believes that the market does not 'see through' the different disclosure methods, it would prefer FN-Leases since the BS-



Leases would cause the volatility of the return on equity to increase. Thus, these aspects of the leasing market should be considered simultaneously in investigating the economic consequences of the lease disclosure regulations.

In this study, two different periods are investigated: i) Period under ASR No.147 and APB Opinion No.31, and ii) Period under SFAS No.13. The market reactions, as reflected in the volatility of the return on equity, to BS-Lease liability and FN-lease liability are investigated and compared with each other. One caveat, however, in addressing the functional fixation issue is the possibility that BS-Lease contract and FN-Lease contract are not economically equivalent since the underlying assets may be different. Therefore, in the following empirical tests, it is assumed that the two types of lease contracts are written on the same asset, and only the disclosure methods differ. Also, in investigating market's response to regulation changes, it is assumed that the nature of FN-Lease contracts under ASR No.147 did not change under SFAS No.13.<sup>9)</sup> Null hypotheses are written below.

**(Null Hypothesis 1):**

There is no difference between BS-Lease and FN-Lease in their impacts on the volatility of equity return of a firm.

**(Null Hypothesis 2):**

There is no difference in the market's reaction to the firms that disclose lease obligations in footnotes relative to the firms that have BS-Leases only.

## IV. Empirical Tests

### 1. Test Model

Consider the following theoretical relationship which is well known in finance literature.

$$\sigma_S = N(d_1)\sigma_v(1+DR), \text{ for } \textit{risky debt}$$

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9) This assumption is necessary to make inferences from the test results, since the disclosure methods may affect the nature of the contracts.

and as a special case,

$$\sigma_S = \sigma_v(1+DR), \text{ for riskless debt}$$

where,

$\sigma_S$  = volatility of the rate of return on equity,

$\sigma_v$  = operating risk of a firm

DR = market financial leverage measured as  $M(D)/S$ , where  $M(D)$  is the market value of debt and  $S$  is the market value of equity,

$N(d_1)$  = the cumulative normal probability of the unit normal variate, where  $d_1$  is defined as follows:

$$d_1 = \frac{\ln(V/D) + r_F T}{\sigma \sqrt{T}} + \frac{1}{2} \sigma \sqrt{T},$$

where

$S$  = the market value of equity,

$V$  = the market value of a firm's assets,

$r_F$  = the risk-free rate,

$T$  = the time to maturity,

$D$  = the face value of debt.

As Geske(1979) points out, the implication is that the financial leverage of a firm alters the total risk or volatility of the return on equity as the market continuously revalues the firm's prospective cash flows. Changes in equity value would change the firm's financial leverage, and the volatility of the return on equity is monotonic increasing with leverage. As the equity value falls (rises), the firm's financial leverage ratio rises (falls), and this increased (decreased) risk is reflected by a rise (fall) in the volatility of the return on equity. Thus, the theory predicts that the two variables should be positively related.

The test model is based on this theoretical relationship. In order to derive an estimated version of the theory, interpretation of the variables  $N(d_1)$  and  $\sigma_v$  is needed.  $N(d_1)$  is the cumulative normal probability of the unit normal variate, where the economic meaning is, from the option pricing framework,

the probability of a call option finishing in the money at its maturity.<sup>10)</sup> If a common stock can be viewed as an option on the assets of a firm, it is reasonable to assume that  $N(d_1)$  is close to 1 as long as the probability of default is low. The variable  $\sigma_v$  represents the operating risk of a firm. Previous empirical studies assumed that the business risks of firms are homogeneous within the same industry, but differ across industries.<sup>11)</sup> Another variable that may be important in explaining cross-sectional differences in business risk is firm size. Castanias (1983) pointed out that an increase in firm size may lead to less business risk per dollar of assets invested, or per dollar of expected earnings due to diversification, and his empirical investigation confirms this argument, indicating a consistent result. Dun & Bradstreet also provides data on the percentage of firm failures classified by size and industry, indicating both variables contain important information on distress likelihood. Industry groupings and firm sizes are therefore used as proxies for different business risk classes in the following model.

$$\begin{aligned}\sigma_{Sit} = & \alpha_t + \sum_{k=1}^K \delta_{kt} D_{kit} + \beta_{1t} SIZE_{it} + \beta_{2t} LQD_{it} \\ & + \beta_{3t} GRWT_{it} + \beta_{4t} RF_{it} + \beta_{5t} \left( \frac{Debt}{MV} \right)_{it} \\ & + \theta_{1t} \left( \frac{CLS}{LTA} \right)_{it} + \theta_{2t} \left( \frac{FLS}{LTA^*} \right)_{it} \\ & + \gamma_{1t} \left( \frac{CLS}{MV} \right)_{it} + \gamma_{2t} \left( \frac{FLS}{MV} \right)_{it} + \varepsilon_{it}\end{aligned}$$

where

- i = 1, ..., N for sample firms,
- t = 1, ..., M for months,
- k = 1, ..., K for industry groups,
- D = industry dummy variable,
- SIZE = size of a firm defined as log-transformation of total asset,
- LQD = liquidity of a firm defined as current asset divided by current liability,
- GRWT = growth of a firm defined as capital expenditure divided by depreciation expense,

10) See Cox and Rubinstein (1985).

11) For example, Hamada (1972), Lev (1974), Ferri and Jones (1979), and Castanias (1983)

- RF = risk-free rate of interest defined as one year US Treasury Bill rate at month  $t$ ,  
 Debt = the portion of conventional debt of a firm,  
 CLS = capitalized lease obligations,  
 FLS = footnote-disclosed lease obligations,  
 LTA = longterm asset of a firm,  
 LTA\* = longterm asset of a firm + FLS,  
 MV = market value of a firm defined as the market value at the end of  $t-1$  month.<sup>12)</sup>

Industry dummy variables and firm size variables are included to explain cross-sectional variations in business risks across firms, and financial leverage variable is also contained in the model as the theoretical relationship suggests. SIZE, LQD, and GRWT variables are included in the model to control for the possible effect of these variables on the volatility of the return on equity. Also, the variables (CLS / LTA) and (FLS / LTA\*) are included to control for the business risks associated with the leased assets. The theory predicts that the coefficient on the financial leverage variable be positive, and the coefficient on the firm size variable be negative to be consistent with prior empirical evidence. Coefficients on dummy variables will be either positive or negative depending on the relative business risk of the specific industry of concern compared to those of other industries not represented by the test model.

## 2. Methodology

The test methodology employed in this section is based on Fama(1976). For each month  $t$  during the test period(to be explained later), least squares method is used to obtain estimates of the coefficients. Then time series of these cross-sectional OLS estimators are summarized and investigated. Under the assumption that the successive values of the coefficients are unbiased, independent, and identically distributed, the following statistics are used in the test. Taking  $\beta_2$  as an example, the following statistics are examined.

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12) The variables are described in detail in Table 1.

$$\bar{\beta}_2 = \frac{1}{M} \sum_{t=1}^M \hat{\beta}_{2t}$$

$$t(\bar{\beta}_2) = \frac{\bar{\beta}_2}{s(\hat{\beta}_2)/\sqrt{M}}$$

where  $s(\hat{\beta}_2)$  is the sample standard deviation of the month-by-month estimators of  $\beta_{2t}$ , and  $M$  is the number of months in the test period. The denominator of  $t(\bar{\beta}_2)$ ,  $s(\hat{\beta}_2)/\sqrt{M}$ , represents the standard error of  $\bar{\beta}_2$ . Therefore, the  $t(\bar{\beta}_2)$  is a drawing from a student distribution with  $M-1$  degrees of freedom. The summary measure of the time series property of the coefficient,  $\bar{\beta}_2$ , is then analyzed in testing the following null hypothesis.<sup>13)</sup>

**Null Hypothesis:**

$$\bar{\beta}_2 = 0$$

### 3. Data Description

The data used are collected from CRSP files and Compustat files. The CRSP monthly files provide data on the price per share and the number of shares outstanding. The month-by-month volatilities of the return on equity are measured as the square root of the sum of the squared daily returns over the month from the CRSP daily file.<sup>14)</sup> The month-by-month financial leverages are constructed by dividing the face value of debt at the end of the previous fiscal year by the market value of equity at the beginning of the month. Although the theory indicates that financial leverage should be stated in market value, it is difficult to obtain market values of debts. Therefore, debt is defined as the longterm debt outstanding disclosed in the bal-

13) See Fama (1976) for a discussion of this test methodology.

14) Thus, the volatility of the return on equity of firm  $i$  in month  $t$  is computed as follows.

$$\sigma_{Sit} = \sqrt{\sum_{d=1}^D (R_{id}^2)}$$

where  $d$  denotes day, with  $D$  representing the number of days in month  $t$ . This volatility measure is based on the assumptions that daily returns are independent and that the mean daily returns are zero. Thus, this measure is unbiased.

ance sheet and the market value of equity at the beginning of each month is used in deriving proxies for financial leverage in market values. Thus, financial leverage in market value is defined as longterm debt divided by market value of equity at the beginning of a month. Note that even though the denominators in debt-equity ratio are changing monthly, the numerators are constant throughout a given year.

To explain cross-sectional variation in business risks of sample firms, industry and firm size are considered based on prior empirical evidence. Industry grouping is based on SIC two-digit level due to data availability. Industry groups are arbitrarily chosen and included in the test model.<sup>15)</sup> Log-transformations of total asset of the firms are used as proxies for the firm size.

The sample firms are those included in both CRSP and Compustat files. In addition, they should have lease obligations disclosed either in the balance sheet or in the footnotes, or both. The test period covers from 1970 to 1982 for stock price changes and from 1969 to 1981 for accounting information. The test period is further classified into several subperiods by the lease disclosure regulations.

#### 4. The Sample

Table 1 describes the variables used in this study. These variables are obtained from Compustat (1986 version), CRSP files, and CITIBASE files. The distribution of sample firms by disclosure method is reported in Table 2. Panel A reports the distribution of sample firms during the Pre-SFAS No. 13 period, where ASR No. 147, APB Opinions No. 5 and No. 31 were in effect.

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15) 8 to 20 observations are required for an industry group to be included in the model.

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**Table 1**  
**Description of Variables**

D28=dummy variable representing Chemicals & Allied Products industry.

D35=dummy variable representing Industrial, Commercial Machinery and Computer Equipment industry.

D36=dummy variable representing Electronics industry.

D37=Dummy variable representing Transportation Equipment industry.

D53=dummy variable representing General Merchandise Stores industry.

D54=dummy variable representing Food Stores industry.

SIZE=size of a firm defined as log-transformation of total asset(Data #6).

LQD=liquidity of a firm defined as current asset divided by current liability: (Data #4) / (Data #5)

GRWT=growth of a firm defined as capital expenditure by depreciation expense: (Data #30) / (Data #14).

RF=risk free rate of interest defined as one year US Treasury Bill rate at month t, retrieved from CITIBASE files.

Debt=the portion of conventional debt of a firm defined as (Data #9)-(Data \$84).

CLS=capitalized lease obligations defined as (Data \$84).

FLS=footnote-disclosed lease obligations defined as (Data #88 under 1986 edition).

LTA=long-term asset of a firm defined as (Data #6)-(Data #4)

LTA\*=long-term asset of a firm defined as [(Data #6)-(Data #4)]+FLS.

MV=market value of a firm defined as the market value at the end of t-1 month, retrieved from CRSP files.

**Note:**

1. All industry groupings are based on two-digit SIC codes.
  2. Data numbers represent the data items of 1986 edition COMPUSTAT Files.
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**Table 2**  
**Distribution of Firms by Disclosure Method**  
**(Per COMPUSTAT, all Fiscal Year-ends)**

**PANEL A: Pre-SFAS NO.13: (ASR No.147, APB Opinions No.5 and No.31)**

<u>Year</u>	<u>All Firms</u>	<u>Group C</u>	<u>Group C&amp;F</u>	<u>Group F</u>
1973	538	254	72	212
1974	647	293	89	265
1975	675	312	99	264
1976	674	326	94	254

**PANEL B: SFAS No.13:**

<u>Year</u>	<u>All Firms</u>	<u>Group C</u>	<u>Group C&amp;F</u>	<u>Group F</u>
1977	757	486	142	129
1978	795	724	38	33
1979	828	814	7	7

**Note:**

1. The data are based on 1986 edition of COMPUSTAT files, including all fiscal year-end firms.
2. Group C represents the group of firms that capitalized their lease obligations and did not use footnote disclosure.
3. Group C&F represents the group of firms that disclosed their lease obligations in both balance sheet and the footnotes.
4. Group F represents the group of firms that disclosed their lease obligations in the footnotes only.

It is noteworthy that many firms are adopting capitalization disclosure method (Group C) and, on the other hand, about the same number of firms are adopting footnote-disclosure method only (Group F). This trend, however, is changing from 1977, where the new regulation became effective. Panel B reports the sample firms under the SFAS No. 13 regulation. Note that 1977 is the first year of the transition period, and firms are moving toward capitalization of leases thereafter. A more detailed analysis of the trend of the disclosure method is reported in Table 3. In this Table, the



**Table 3**  
**Distribution of Sample Firms used in this Study<sup>a</sup>**

**PANEL A: Pre-SFAS NO.13: (ASR No.147, APB Opinions No.5 and No.31)**

<u>Year</u>	<u>Group C</u>	<u>Group C&amp;F</u>	<u>Group F</u>
1973	177	57	153
1974	192	69	192
1975	200	68	177
1976	229	63	171
1977	n / a	108 <sup>b</sup>	96 <sup>b</sup>

**PANEL B: Capitalization under SFAS No.13<sup>c</sup>:**

<u>Year</u>	<u>Group C</u>	<u>Group C&amp;F</u>	<u>Group F</u>
1977	193	n / a <sup>b</sup>	n / a <sup>b</sup>
1978	199	50	115
1979	199	61	140

**Note:**

1. Group C represents the group of firms that capitalized their lease obligations and did not use footnote disclosure during pre-SFAS No.13 period.
2. Group C&F represents the group of firms that disclosed their lease obligations in both balance sheet and the footnotes during pre-SFAS No.13 period.
3. Group F represents the group of firms that disclosed their lease obligations in the footnotes only during pre-SFAS No.13 period.

a. The sample firms used in this study have met the data selection criteria: i.e., firms should be listed in both CRSP and COMPUSTAT files and firms should have lease obligations disclosed either in balance sheet or in footnotes or both. Also, the number of firms reported is based on the fourth month after each fiscal year-end.

b. Because of the transition nature, 1977 is included in PANEL A for groups C&F and F based on their disclosure methods.

c. The firms reported here represent firms that capitalized their lease obligations under SFAS No.13. Firms of Group C are those that capitalized lease obligations in 1976 and under SFAS No.13. For Group C&F, the firms reported are the ones that had both disclosure methods in 1976 but chose capitalization under SFAS No.13. For Group F, the firms reported are the ones that disclosed lease obligations in the footnotes in 1976 but chose capitalization under SFAS No.13. The year 1976 is chosen over 1977 because of the transition nature of 1977.

firms reported are those that capitalized their lease obligations under SFAS No.13. Firms of Group C are those that capitalized lease obligations in 1976 and under the period of SFAS No.13. For Group C&F, the firms reported are the ones that had both disclosure methods in 1976 but chose capitalization under SFAS No.13. For Group F, the firms are the ones that disclosed lease obligations in the footnotes in 1976 but chose capitalization under SFAS No.13. In this Table, the year 1976 is chosen rather than 1977 because of the transition nature of 1977. Thus, from the Tables 2 and 3, it is clear that firms are moving toward capitalization of leases, which is consistent with SFAS No.13's strict capitalization criteria.

## 5. Test Results

### (1) The Capitalization Group

The market perceptions of lease obligations relative to the conventional debts are reported in Table 4. In this Table, the sample firms are those that capitalized lease obligations during the Pre-SFAS No.13 as well as SFAS No.13 periods. The  $\bar{R}^2$  ranges from 9.9% to 54.9% showing a modest explanatory power of the test model. The reported condition indices show that the degrees of multicollinearity are not problematic except for some extreme cases.

Note that the firms of Chemicals & Allied Industry (D28) and Electronics Industry (D36) experienced higher return volatility level relative to other industries, and the firms of Machinery & Computer Industry (D35) experienced relatively lower level of return volatility. The Transportation Industry (D37) was not clear in terms of the effect on the return volatility since the results reported in Panel A is positive (but insignificant) but Panel B shows negative and weakly significant coefficients. The SIZE and LQD variables are all negative and statistically significant, suggesting that large firms and highly liquid firms show lower level of return volatility. The risk free rate (RF) of interest also has a negative impact on return volatility whereas the direction of the growth factor (GRWT) is not clear.

As described earlier, the variable (Debt / MV) denotes the financial leverage of a firm and the theory predicts that it should have a positive coefficients. The test shows a consistent result: the coefficients are 0.0136 during

**Table 4**  
**Market Perceptions of Lease Obligations relative to Conventional Debt**  
**(Capitalization Only Group)<sup>a</sup>**

**PANEL A: Pre-SFAS No.13: (N=48)**

Variables <sup>b</sup>	Mean	Autocorrelation <sup>c</sup>	T	P-value
Intercept	.2473	.4194	15.121	.0001
D28	.0193	.4141	9.141	.0001
D35	-.0145	.4993	-6.831	.0001
D36	.0172	-.0027	9.956	.0001
D37	-.0007	.3079	0.411	.6830
SIZE	-.0203	.6826	-34.131	.0001
LQD	-.0049	.2255	-6.755	.0001
GRWT	-.0002	-.0708	-.472	.6389
RF	-.5355	.4729	-2.320	.0247
Debt / MV	.0136	.3896	19.638	.0001
CLS / LTA	-.0086	.2420	-1.148	.2565
CLS / MV	.0074	-.0645	2.333	.0240
	Mean	Median	Min.	Max.
$\overline{R^2}$ :	.372	.371	.196	.549
Condition Index <sup>d</sup> :	53.6	52.4	26.4	81.3
DW-Statistic <sup>e</sup> :	1.961	1.957	1.525	2.280

**PANEL B: Under SFAS No.13: (N=36)**

Variables <sup>b</sup>	Mean	Autocorrelation <sup>c</sup>	T	P-value
Intercept	.1977	.3932	13.235	.0001
D28	.0186	.2040	9.964	.0001
D35	-.0018	.1787	-1.192	.2412
D36	.0106	.1487	6.112	.0001
D37	.0034	.2830	1.685	.1008
SIZE	-.0177	.4184	-33.077	.0001
LQD	-.0040	.0255	-7.098	.0001
GRWT	.0007	.6547	1.812	.0786
RF	-.0383	.2833	-.453	.6532
Debt / MV	.0096	.3348	18.301	.0001
CLS / LTA	-.0255	.1506	-3.871	.0001
CLS / MV	-.0107	.3265	1.706	.0968
	Mean	Median	Min.	Max.
$\overline{R^2}$ :	.280	.284	.099	.400
Condition Index <sup>d</sup> :	45.8	40.7	22.6	118.4
DW-Statistic <sup>e</sup> :	1.969	1.978	1.725	2.261

**PANEL C: Paired Comparisons of Mean Coefficients**

	Mean Difference <sup>f</sup>	Std Err <sup>g</sup>	T	p-value
<i>Pre-SFAS No.13: Debt vs Capitalized Lease Obligation:</i>				
	.0062	.0035	1.756	.0856
<i>Under SFAS No.13: Debt vs Capitalized Lease Obligation:</i>				
	-.0012	.0065	-.180	.8580

**Note:**

- a. The firms used in this part are the ones that capitalized their lease obligations before the enactment of SFAS No.13 and continued to use capitalization under SFAS No.13. The firms in PANEL B are based on 1976 capitalizing firms.
- b. See table 1 for variable descriptions.
- c. Autocorrelation is based on one-month lag.
- d. For multicollinearity check, condition indexes are calculated using Belsley, Kuh, and Welsch(1980), which is available in SAS statistical package.
- e. In order to check the non-linearity of the relationship in equation(1), Durbin-Watson statistics are reported, using SAS.
- f. Mean differences are the differences in coefficients of debt and lease variables.
- g. Std Err stands for standard error.

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the Pre-SFAS No.13 period and 0.0096 under the SFAS No.13 period and they are both statistically significant. The variable (CLS / LTA) should show a negative sign according to the SIZE variable, and this is confirmed by the test results: -0.0086 (negative but statistically insignificant) in Panel A and -0.0255 (negative and statistically significant) in Panel B. The coefficients on (CLS / MV) represent market's perception of lease obligations and if the lease obligations are regarded as a debt, they should be positive. Again, the results are consistent: 0.0074 (positive and significant) in Panel A and 0.0107 (positive and significant at 10% level) in Panel B. Therefore, it is found here that the lease obligations are regarded as a debt by the capital market and this is consistent with the theory prediction.

Panel C reports the result of the Paired Comparisons of Mean Coefficients. The results show that, under the Pre-SFAS No.13 period, the conventional debts are regarded as riskier than the capitalized lease obligations: the result is statistically significant at 10% level. However,

under the SFAS No.13 period, the result shows that the conventional debts and the lease obligations are about the same in terms of market perceptions of their riskiness. This is interesting in a sense that under the SFAS No.13 the capitalization criteria are very strict relative to those under Pre-SFAS No.13 period.

## (2) The Footnote Disclosure Group

In this section, the market perceptions of footnote disclosed lease obligations relative to the conventional debts are examined. The sample firms used here are those that disclosed lease obligations in the footnotes during the Pre-SFAS No.13 but chose capitalization method under SFAS No.13 periods. The  $\overline{R}^2$  ranges from 20.3% to 57.3%, also showing a modest explanatory power of the test model. The reported condition indices show that the degrees of multicollinearity are not problematic.

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**Table 5**  
**Market Perceptions of Lease Obligations relative to Conventional Debt**  
**(Footnote Disclosure Only Group)**

**PANEL A: Pre-SFAS No.13 and Transition Period: (N=60)**

Variables	Mean	Autocorrelation (lag=1 month)	T	P-value
Intercept	.2736	.4245	17.619	.0001
D53	.0010	.3559	.324	.7472
D54	-.0259	.2783	-13.189	.0001
SIZE	-.0238	.6561	-31.710	.0001
LQD	-.0093	-.2448	-14.462	.0001
RF	-.0022	.2286	-5.295	.0001
GRWT	.0171	.2775	.089	.9289
Debt / MV	.0049	.1479	16.897	.0001
CLS / LTA	.	.	.	.
FLS / LTA*	-.0329	.4881	-6.383	.0001
CLS / MV	.	.	.	.
FLS / MV	.0044	.0373	2.836	.0063
	Mean	Median	Min.	Max.
$\overline{R}^2$ :	.375	.371	.219	.524
Condition Index:	50.5	49.8	26.7	86.9
DW-Statistic:	2.001	2.037	1.387	2.406

**PANEL B: Under SFAS No.13 (N=24)**

Variables	Mean	Autocorrelation (lag=1 month)	T	P-value
Intercept	.2407	.4261	9.688	.0001
D53	-.0120	.0168	-3.262	.0034
D54	-.0248	-.0729	-9.483	.0001
SIZE	-.0164	.2322	-20.798	.0001
LQD	-.0083	.3461	-6.843	.0001
RF	-.0059	.1791	-5.956	.0001
GRWT	-.1763	.3328	-.712	.4836
Debt / MV	.0057	.5726	6.273	.0001
CLS / LTA	-.0268	.2742	-4.055	.0005
FLS / LTA*	.	.	.	.
CLS / MV	.0051	.3521	2.155	.0418
FLS / MV	.	.	.	.
	Mean	Median	Min.	Max.
$\overline{R^2}$ :	.340	.336	.203	.573
Condition Index:	45.7	38.2	24.8	94.3
DW-Statistic:	1.857	1.825	1.600	2.134

**PANEL C: Paired Comparisons of Mean Coefficients**

	Mean Difference <sup>f</sup>	Std Err <sup>g</sup>	T	p-value
<i>Pre-SFAS No.13: &amp; Transition Period: Debt vs Footnote-disclosed Lease Obligations</i>				
	.0006	.0017	.328	.7437
<i>Under SFAS No.13: Debt vs Capitalized Lease Obligation:</i>				
	.0005	.0030	.178	.8579

Note that the firms of General Merchandise Industry (D53) and Food Stores (D54) experienced lower return volatility level relative to other industries. The SIZE, LQD, and GRWT variables are all negative and statistically significant, suggesting that large firms, highly liquid firms, and high growth firms show lower level of return volatility.

The variable (Debt / MV), denoting the financial leverage of a firm, shows a positive coefficients: they are 0.0049 during the Pre-SFAS No.13 period and 0.0057 under the SFAS No.13 period, and they are both statistically significant. The lease variables included in the test models are based on footnote-disclosed lease obligations under the Pre-SFAS No.13 period and the capitalized lease obligations under the SFAS No.13 period. This is due to

the nature of the sample firms: they are the ones that used footnote disclosure before the regulation change and then used capitalization under the new regulation. The coefficients on these lease variables used for the control of the asset side,  $(FLS / LTA^*)$  and  $(CLS / LTA)$ , are both negative and statistically significant, which is consistent with the results reported in Table 4.

The coefficients on the lease variable to denote the financial leverage effects,  $(FLS / MV)$  and  $(CLS / MV)$ , are both positive, indicating that the market regards these lease obligations as debts. During the Pre-SFAS No.13 period, the magnitude of the lease obligations variable is 0.0044, and during the SFAS No.13 period, the magnitude is 0.0051. Therefore, it is reasonable to say that the market perceives the footnote-disclosed lease obligations and they are regarded as debts. Panel C reports the result of the Paired Comparisons of Mean Coefficients. The results show that, under the Pre-SFAS No.13 period, the footnote-disclosed lease obligations are regarded as risky as the conventional debts and this result holds for the SFAS No.13 period, where the lease variable is the capitalized lease obligations. This should be so because the footnote-disclosed lease obligations are now being capitalized under the new rule and they are basically the same lease contracts.

### (3) The Capitalization and Footnote Disclosure Group

Table 6 reports the market's perception of the lease obligations of the firms that used both capitalization and footnote disclosure.

Panel A reports the test statistics when the coefficients of conventional debt and lease obligations are not restricted. However, although the coefficients on the conventional debt and the capitalized lease obligation variables have a correct sign (positive and significant), the signs of the coefficients on the footnote-disclosed lease obligations are reversed, which may be due to some multicollinearity problem. Therefore, in Panel B which shows test results under the Pre-SFAS No.13 period, a restriction is imposed such a way that the coefficients on the capitalized leases and the footnote disclosed leases have the same signs and magnitudes. This restriction is put on the asset side only because the liability side is a matter of research interest. After the restriction, we observe that the asset side lease variables have an expected signs (negative), which are also statistically significant. The financial leverage variables,  $(Debt / MV)$ ,  $(CLS / MV)$ , as well

**Table 6**  
**Market Perceptions of Lease Obligations relative to Conventional Debt**  
**(Capitalization & Footnote Disclosure Group)**

**PANEL A: Pre-SFAS No.13 and Transition Period: (N=60)**

Variables	Mean	Autocorrelation (lag=1 month)	T	P-value
Intercept	.2447	.5952	12.682	.0001
SIZE	-.0213	.4969	-30.114	.0001
LQD	-.0126	.5086	-9.692	.0001
GRWT	-.0003	.0461	-.552	.5832
RF	-.1048	.5159	-.416	.6790
Debt / MV	.0054	.4683	9.223	.0001
CLS / LTA*	-.1299	.1108	-9.979	.0001
FLS / LTA*	.0366	.0463	4.339	.0001
CLS / MV	.0929	.1755	13.174	.0001
FLS / MV	-.0011	.2074	-.953	.3446
	Mean	Median	Min.	Max.
$\overline{R^2}$ :	.339	.324	.108	.550
Condition Index:	50.6	48.2	27.9	100.1
DW-Statistic:	2.041	2.086	1.310	2.609

**PANEL B: Pre-SFAS No.13 and Transition Period(Restricted Model) (N=60)**

Variables	Mean	Autocorrelation (lag=1 month)	T	P-value
Intercept	.2595	.5700	14.403	.0001
SIZE	-.0220	.514	-29.314	.0001
LQD	-.0133	.3706	-11.584	.0001
GRWT	-.0001	.0692	-.111	.9119
RF	-.2157	.4890	-.892	.3762
Debt / MV	.0061	.4120	11.045	.0001
CLS / LTA*	-.0146	.2451	-2.181	.0331
FLS / LTA*	.0146	.2451	-2.181	.0331
CLS / MV	.0468	.3373	7.610	.0001
FLS / MV	.0041	.1249	4.148	.0001
	Mean	Median	Min.	Max.
$\overline{R^2}$ :	.326	.306	.097	.557
Condition Index:	50.6	48.2	27.9	100.1
DW-Statistic:	2.049	2.097	1.242	2.546



**PANEL C: Under SFAS No.13 (N=24)**

Variables	Mean	Autocorrelation (lag=1 month)	T	P-value
Intercept	.1520	.5598	7.613	.0001
SIZE	-.0101	.4248	-10.211	.0001
LQD	-.0123	.3987	-8.124	.0001
GRWT	.0001	.3843	.061	.9520
RF	.1600	.4765	.948	.7433
Debt / MV	.0035	.5622	3.257	.0035
CLS / LTA	.0227	.1367	3.083	.0053
FLS / LTA*	.	.	.	.
CLS / MV	.0042	.1092	1.061	.2999
FLS / MV	.	.	.	.
	Mean	Median	Min.	Max.
$\overline{R^2}$ :	.249	.285	.060	.414
Condition Index:	40.7	33.7	22.1	83.9
DW-Statistic:	1.955	1.977	1.523	2.398

**PANEL D: Paired Comparisons of Mean Coefficients**

	Mean Difference	Std Err	T	p-value
<u>Pre-SFAS No.13 &amp; Transition Period (Unrestricted):</u>				
<i>a. Debt vs Capitalized Lease Obligation</i>				
	-.0875	.0074	-11.728	.0001
<i>b. Debt vs Footnote-disclosed Lease Obligation</i>				
	.0065	.0016	4.176	.0001
<i>c. Capitalized vs Footnote-disclosed Lease Obligations</i>				
	.0940	.0068	13.819	.0001
<u>Pre-SFAS No.13 &amp; Transition Period (Restricted)):</u>				
<i>a. Debt vs Capitalized Lease Obligation</i>				
	-.0407	.0066	-6.156	.0001
<i>b. Debt vs Footnote-disclosed Lease Obligation</i>				
	.0020	.0014	1.418	.0001
<i>c. Capitalized vs Footnote-disclosed Lease Obligations</i>				
	.0427	.0056	7.587	.0001
<u>Under SFAS No.13:</u>				
<i>Debt vs Capitalized Lease Obligation</i>				
	-.0008	.0045	1.166	.8679

as (FLS / MV), show a positive and significant coefficients: 0.0061 for the conventional debts, 0.0468 for the capitalized lease obligations, and 0.0041 for the footnote-disclosed lease obligations.

Panel C reports test results under the SFAS No.13 period. The results indicate that, although the magnitudes are different, the coefficients on both the capitalized lease obligations and the footnote-disclosed lease obligations are positive and statistically significant. This result also suggests that the market perceives the lease obligations as debt for the Capitalization and Footnote-Disclosure Group.

Panel D shows the results of Paired Comparisons of Mean Coefficients. Taking the results under the restricted test model, we observe that, under the Pre-SFAS No.13 period, the market regards the capitalized lease obligations riskier than both the conventional debts as well as the footnote-disclosed lease obligations, and the conventional debts riskier than the footnote-disclosed lease obligations. However, under the SFAS No.13 period where the lease obligations previously put in the footnotes are now capitalized, the capitalized lease obligations are as risky as the conventional debts.

#### (4) Market Perceptions under the Different Reporting Environments

Table 7 reports the results of the tests on how differently the market perceives lease liabilities under changing reporting environments. Note that the changes in the lease reporting regulations are described in section 2. Thus, the turning point used in these tests is the imposition of SFAS No.13 and for each separate group tests are conducted by comparing market's perceptions of lease liabilities. For the Capitalization only Group, the test is done on the comparison between the coefficients of the capitalized lease obligations before and after the change. For the Footnote Disclosure Only Group, the test is between the coefficients on the footnote-disclosed lease obligations before the change and the capitalized lease obligations after the change. For the Capitalization & Footnote Disclosure Group, however, the tests are between capitalized lease obligations before and after the change, and between footnote-disclosed lease obligations and capitalized lease obligations before and after the change, respectively.

The results indicate that except for the comparison between capitalized lease obligations for the Capitalization & Footnote Disclosure Group, the

market perceives lease obligations as debts whether they are capitalized or disclosed in the footnotes. Thus, it seems that the disclosure method does not matter.

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**Table 7**  
**Changes in Market Perceptions of Lease Obligations**  
**under Changing Reporting Environments**

	N	Mean	Variance	T	p-Value
<b>A. <u>Capitalization Only Group:</u></b>					
<i>(Capitalization to Capitalization)</i>					
Before Change:	48	.0074	Unequal	-.472	.6393
After Change:	36	.0107			
<b>B. <u>Footnote Disclosure Only Group:</u></b>					
<i>(Footnote to Capitalization)</i>					
Before Change:	60	.0044	Equal	-.271	.7873
After Change:	24	.0051			
<b>C. <u>Capitalization &amp; Footnote Disclosure Group:</u></b>					
<i>(Capitalization to Capitalization, Unrestricted)</i>					
Before Change:	60	.0929	Unequal	10.944	.0001
After Change:	24	.0042			
<i>(Capitalization to Capitalization, Restricted)</i>					
Before Change:	60	.0468	Unequal	5.809	.0001
After Change:	24	.0042			
<i>(Footnote to Capitalization, Unrestricted)</i>					
Before Change:	60	-.0011	Unequal	-1.282	.2109
After Change:	24	.0042			
<i>(Footnote to Capitalization, Restricted)</i>					
Before Change:	60	.0041	Unequal	-.023	.9819
After Change:	24	.0042			

## V. Conclusion

This study addresses the issue of market's perception of lease obligations and, if so, how different are the lease obligations relative to the conventional debts. Also, considering the changes in the lease disclosure regulations, this study investigates the issue of market's differential perceptions of lease obligations depending on their place of disclosure.

The results indicate that, as the theory suggests, the market perceives lease obligations as debt and under the SFAS No.13, the lease obligations are regarded as risky as the conventional debts, and the disclosure method does not matter. The results also indicate that the changing reporting environments do not matter in the market's perceptions of lease obligations.

An interesting result, however, is that before the enforcement of SFAS No.13, we observe a differential market perceptions of lease obligations relative to the conventional debts: For the group of firms that used capitalization method before and after the SFAS No.13, the conventional debts are riskier than the capitalized lease obligations. Also, for the firms that used both capitalization and footnotes for the disclosure, the capitalized lease obligations are riskier than the conventional debts and the footnote-disclosed lease obligations, and the conventional debts are riskier than the lease obligations disclosed in footnotes. There are three possible reasons that would make the conventional debts and the lease contracts different from each other: first, the underlying assets for each contract may be different. Second, the lease contracts usually carry more flexible terms, and third, the regulation imposes capitalization criteria with respect to leases. It is not clear whether these factors contribute to the differential market perception. Therefore, further study is needed to provide clear insight into the nature of market's perception of lease obligations, which also consider the economic factors that would affect lease decisions within a firm.

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