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Financial Effects of the Right-To-Use Model for Lessees

Hong S. Pak¹, California State Polytechnic University, Pomona

Byunghwan Lee, California State Polytechnic University, Pomona

Heung-Joo Cha, University of Redlands

ABSTRACT

To examine the financial effects of the proposed right-to-use model (or capitalization of operating lease) for lessees with the U.S. public firms, we analyzed 80 experimental firms and 88 control firms. Our results show that the adoption of the right-to-use model has insignificant effects on the liquidity measure of the current ratio. However, the adoption has strong negative effects on the financial flexibility measured by the debt-to-asset ratio, and has significant effects on the various profitability measures of EBIT and EBT. Thus, our findings indicate that the adoption of the right-to-use model has significant economic consequences to the firms whose relatively large portions of the long-term leased properties are classified as operating leases under the current accounting rules

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¹ The corresponding author, hspak@csupomona.edu

1. Introduction

On August 17, 2010, the Financial Accounting Standards Board (FASB) issued the Exposure Draft (ED) to solicit public opinions on lease accounting rules (the U.S. Accounting Standards Codification Topic 840). The Board proposed to change the lease accounting model to the right-to-use model from the bifurcation model (i.e., operating vs. capital leases) for lessees. The right-to-use model requires all lessees to capitalize their long-term leased properties as operating assets and to recognize the same amount as liabilities. Since the majority of businesses in the United States are involved in lease, the adoption of the proposed lease accounting rules would have significant financial effects that consequently would result in economic consequences.

The capitalization of operating leases has been addressed in the early 1960s (see Nelson, 1963). Imhoff *et al.* (1991 and 1997) illustrated how operating leases would be constructively capitalized, and demonstrated with limited firms how significantly the constructive capitalization would affect balance sheet accounts and income measures. Following Imhoff *et al.*'s constructive capitalization method, Beattie *et al.* (1998) expanded the number of firms to 300 randomly selected sample firms in the United Kingdom in order to examine how significantly the capitalization of operating leases would affect accounting ratios. They found that it had statistically significant impacts on profitability measures (e.g., profit margin and return on assets), and financial structure measures (e.g., the long-term debt to capital ratio and the total debt-to-equity ratio). Fulbier *et al.* (2008) examined the same issue with 90 major German companies. They observed significant effects on balance sheet accounts and minor effects on profitability measures. They also identified that the financial effects varied among different industries.

Just as Imhoff *et al.*'s (1991 and 1997) constructive capitalization model states, we expect the right-to-use model to have negative effects on firms' liquidity and financial flexibility. That is, since the model would increase current liabilities while maintaining the current assets, the firms' overall liquidity would decrease. The model would worsen the firms' financial flexibility since more liabilities than assets need to be recognized in the earlier periods. On the other hand, depending on the financial ratios used to measure profitability, the model's effects on profitability varies; such variance arises due to the decomposition of the lease payments and the different timing recognition of the decomposed amounts as expenses. The operating lease

payments under current lease rules would be decomposed into depreciation and interest expenses when they are capitalized under the proposed right-to-use accounting rules. However, the combined amount of depreciation and interest would not be the same as the operating lease payment for each reporting period. Thus, we expect that the right-to-use model would have positive effects on firms EBIT's (operating earnings before interest and taxes) in earlier periods, while it would have negative effects on firm's EBT (operating earnings before taxes) in earlier periods.

Like the studies of Beattie *et al.*(1998) and Fulbier *et al.* (2008), we examine the financial effects of the proposed right-to-use model for lessees, but within U.S. public firms. We separate a priori our sample firms into 80 experimental firms and 88 control firms in order to analyze the effects of capitalization. The experimental firms are from the industries where prior studies indicated that significant portions of the firms' operating assets are operating leases under the current lease accounting rules. The control firms are from those industries where operating leases are smaller portions of the firms' operating assets.

Our study shows that the adoption of the right-to-use model has significant effects on the financial flexibility measured by the debt-to-assets ratio. We also find that it has significant effects on the profitability measures of earnings before interest and income taxes (EBIT) and earnings before income taxes (EBT). However, it has insignificant effects on the liquidity measure of the current ratio. The results of our study imply that firms with operating assets that are largely made up of operating leases may increase their cost of capital as their financial flexibility becomes more restricted. Such results also indicate that the adoption may have substantial impacts on the stock prices of those firms with large operating leases under the current rules.

Our study contributes to the accounting literature by identifying the income statement and balance sheet effects through examining the financial effects of the proposed right-to-use model for lessees. This study is distinctive from existing literature because we utilize a larger and more

comprehensive data set by analyzing 80 experimental firms and 88 control firms.² The rest of the paper is organized as follows: Section 2 presents the background of the right-to-use model; Section 3 reviews the related literature; Section 4 lays out the theoretical hypotheses; Section 5 discusses the sample and measurements of key variables; Section 6 presents the empirical results; and the conclusion follows.

2. Background: Lease Accounting for Lessees: Right-to-Use Model

The bifurcation of the leased properties under the U.S. lease accounting rules has been one of the most controversial issues in financial accounting since the FASB issued its Statement No. 13, “Accounting for Lease” in 1976. The accounting rules require the lessees to determine whether or not the leased properties meet one of four conditions prescribed in the FASB’s Accounting Standards Codification Topic 840.³ If the leased properties meet any one of such prescribed conditions, such properties are to be classified as capitalized leases and recorded as operating assets and as lease liabilities. Otherwise, such properties should be operating leases.

Under the bifurcation lease accounting model, the lessees prefer to account for leased properties as operating leases rather than as capitalized leases because the lessees are able to effectively finance their long-term operating assets without presenting the financing liabilities on their balance sheet (so called “off-balance-sheet financing”) under operating leases. Further, they prefer operating leases because operating leases have an income smoothing effect since lease expenses are evened over the lease term. Due to the lessees’ preference for operating leases, the bifurcation model has been criticized as ineffective in lease accounting. The FASB (ED, p1) states that

The existing accounting models for leases require lessees to classify their leases as either capital leases or operating leases. However, those models have been

² While our sample size in total is less than that of Beattie *et al.*, it is larger than that of other prior studies (Fulbier *et al.*, Imhoff *et al.* and Grossman and Grossman). Our 168 firms are considered to be large since we hand-collected some of our data (e.g., minimum lease payments and discount rates).

³The prescribed conditions for classification are (1) ownership transfer at the end of lease term, (2) bargain purchase options, (3) the lease term period of 75 percent or more of economic life and (4) the present value of minimum lease payments (as defined in the rules) which is at least 90 percent of economic benefits from the leased property.

criticized for failing to meet the needs of users of financial statements because they do not provide a faithful representation of leasing transactions. In particular, they omit relevant information about rights and obligations that meet the definitions of assets and liabilities in the boards' conceptual framework. The models also lead to a lack of comparability and undue complexity because of the sharp 'bright-line' distinction between capital leases and operating leases.

To deal with such controversial issues of lease accounting, the FASB has made joint efforts with the IASB (International Accounting Standards Board). After issuing their "Discussion Paper Leases: Preliminary Views" in March 2009, the Boards issued the Exposure Draft (ED) on Leases in August 2010. Even after the ED, the Boards have made numerous due-diligence efforts to develop better lease accounting rules. Because several issues were raised by the interest parties, the Boards decided to reissue the ED in 2012. While the Boards have not finalized lease accounting rules yet, the updated tentative decisions indicate that the Boards may adopt the right-to-use model for lessees. The proposed model removes the conditions required for capitalized leases and by doing so removes the bifurcation issue for the lessees. That is, all the long-term leases will be capitalized.⁴ The FASB asserts that the right-to-use model enhances the usefulness of financial information since it provides a more representational, comparable and complete lease information to capital market participants.

The right-to-use model focuses on the lessee's right to use a specific asset under the lease agreement. Under the lease term, the lessee has the right to use the asset during the lease term in exchange for lease payments. The lessee should capitalize the benefits to be realized from such right and recognize the capitalized benefits as operating right-to-use assets. At the same time, the present value of the lease obligations should be recognized as lease liabilities. It should be calculated at the lessor's implicit interest rate (if readily available) or incremental borrowing rate (if the lessor's implicit interest rate is not known). It is presumed that at the contract date, the economic benefits from the lease right should be the same as the present value of the lease obligations. As such, the operating assets to be recognized should be the same as the lease

⁴ The long-term refers to more than 12 months of maximum possible lease terms in the ED.

liabilities at the outset of capitalization. As a result, the adoption of the right-to-use model increases both the lessee's assets and liabilities in the balance sheet regardless of lease types (operating and capital leases) under the current lease accounting rules.

Subsequent to the initial recognition, the lease assets should be amortized over the shorter of the lease term or the useful life of the leased property. The lease liability should similarly be accounted for in order to account for a long-term loan. Interest expense should be calculated with the effective interest method. Thus, the adoption of the right-to-use model replaces depreciation with amortization for capital leases under the current lease accounting rules. Also, the adoption would replace rental expense with both amortization and interest expense for an operating lease.

3. Related Literature

Prior studies (e.g., Imhoff *et al.*, 1991 and 1997; Beattie *et al.*, 1998; Fulbier *et al.*, 2008; and Grossman and Grossman, 2010) address the issues of the financial effects of the operating lease capitalization. These studies demonstrate that the capitalization would affect long-term assets, as well as current and non-current liabilities. These results demonstrate that the operating lease capitalization would affect the firms' liquidity (e.g., current ratio), capital flexibility (e.g., debt-to-asset ratio) and profitability (e.g., profit ratio).

Imhoff *et al.* (1991) introduce the constructive capitalization model of how operating leases should be constructively capitalized. They provide empirical evidence showing the significance of capitalization on the balance sheet items. Their sample of seven pairs of firms in different industries for the 1987 fiscal year shows that the financial effects (e.g., the return on asset, debt-to-equity ratio) are material. Imhoff *et al.* (1997) extend the effect of the model to the income statement items. They assert that the financial data is misled when the income effect is not taken into account. Their anecdotal cases with K-Mart Corporation and two retail grocery store chains indicate that the income measures (e.g., operating income divided by revenue) and profitability ratios (e.g., return on asset, return on equity) are significantly affected by the capitalization of operating leases.

While Imhoff *et al.* (1991, 1997) provide the theoretical model to constructively capitalize operating leases, their studies are limited in generalization due to the anecdotal nature of their case study and a small and non-random sample. Grossman and Grossman (2010) analyze 91 non-financial companies from the top 200 Fortune 500 companies to examine the impact of the right-to-use model on those firms' current liabilities and non-current liabilities. Their analysis shows that the current liabilities are increased by less than 5% for 70 companies of the 91 non-financial companies, and by 10% or more for 13 of those companies. The non-current liabilities increase by less than 5% for 50 companies and by 10% or more for 29 companies. Further, to examine the financial ratio effects, they analyze eight companies that disclose leased assets for capitalized leases. They report that the current ratios decrease by 1% to 40% while the debt-to-asset ratios increase by 1% to 28% for those firms.

Compared to the aforementioned studies with the U.S. firms, Beattie *et al.* (1998) and Fulbier *et al.* (2008) carry out more rigorous studies with U.K. companies and German companies, respectively. Beattie *et al.* (1998) analyze 232 U.K. listed companies. They find that the capitalization of operating leases increases 39% of long-term debt with wide variations across different industries. Their results show that it also increases about 6% of total assets with the range of 0.8% to 13% in different industries and has significant effects on profit margin, return on assets, turnover and the three different measures of the debt-to-equity ratios. They find that the financial effects of the capitalization are different among the industries and that the service industry is most significantly affected.

Fulbier *et al.* (2008) examine 90 German listed firms. They report that the capitalization yields 17.3% median increases in liabilities and 8.5% increase in non-current assets. Further, they find that the median EBIT increases by 2.9%, and net income increases by 0.2%. Their financial ratio analysis shows that the median structural changes in the balance sheet measured by long-term assets divided by total assets, debt-to-equity, and equity-to-assets are 3.9%, 8%, and -4.9%, respectively. The median relative changes in the profitability ratios range from -2.0% to 2.9%. Retail and fashion are the industries in which the financial effects are strongest among the industries analyzed.

In summary, the prior studies consistently show that the capitalization of operating leases significantly affects the balance sheet items and financial flexibility measured by the debt-to-equity or debt-to-asset ratio. Furthermore, these studies consistently indicate that the financial effects are different among industries. However, its impact on profitability is not consistent. None of the studies examines how the capitalization of operating leases affects liquidity measured by a current ratio, while Grossman and Grossman (2010) descriptively analyze its impact on current liability.

4. Hypotheses: Financial Effects of the Adoption of Right-to-Use Model

4.1. Balance Sheet Effects

The right-to-use model has impacts not only on the balance sheet measures but also on income statement measures. As shown in the prior studies, it affects the current and non-current liabilities and the long-term assets. Also, it affects equity due to timing of recognition of periodic income components. Due to the accounting conventions for the income components under the right-to-use model, lease liabilities always exceed capitalized lease assets. Therefore, equity decreases as a result of adopting the model. The impact of capitalization on the balance sheet measures depends on how much of the firms' recognized or unrecognized operating assets is related to operating leases under the current lease accounting rules. Its impact is larger when relatively large portions of the long-term leased properties are classified as operating leases under the current accounting rules, which leads to the following hypothesis:

H1: The capitalization of operating leases has greater impact on the balance sheet measures (e.g., current and non-current liabilities and long-term assets) for firms with more intensive long-term leases than for firms with less intensive long-term leases.

Since the capitalization affects current liabilities but does not affect current assets, it worsens liquidity measured by a current ratio. Furthermore, we expect that such declines are

greater when relatively large portions of the long-term leased properties are classified as operating leases under the current accounting rules. We restate this conjecture as the following hypothesis:

H2: The capitalization of operating leases for firms with more intensive long-term leases results in a greater decline in a current ratio than for those with less intensive long-term leases.

The capitalization has negative impact on equity as more liabilities are recognized than long-term assets at any reporting date. Thus, it increases a debt-to-asset ratio. Furthermore, we anticipate that such an increase is greater when relatively large portions of the long-term leased properties are classified as operating leases under the current accounting rules.

H3: The capitalization of operating leases increases a debt-to-asset ratio for firms with more intensive long-term leases more than for those with less intensive long-term leases.

4.2. Income Statement Effects

The right-to-use model has impacts on the periodic income measures in two aspects: decomposition and timing. The decomposition effect occurs because the capitalization requires lessees to periodically amortize the capitalized lease assets over the lease terms using the accounting convention such as a straight-line method and to recognize the interest expenses on the lease liabilities using an effective interest method. That is, the capitalization decomposes rent (or lease) expense for lease payments into amortization and interest expenses. Due to the

decomposition effect of the capitalization, the model increases the periodic income measures of EBIT over the lease term because amortization alone under the model will be lower than the operating lease expense (payment) under the current rule. The EBIT in the earlier lease periods is affected more significantly than in later lease periods due to the effective interest method. Its impact on the EBIT also depends upon how intensive the long-term leased properties are classified as operating leases under the current accounting rules.

H4: The capitalization of operating leases for the firms with more intensive long-term leases results in greater increase in EBIT during the earlier lease periods than for those with less intensive long-term leases.

The timing effect occurs because the capitalization of operating leases does not recognize the same amount of a periodic lease payment in income statement for each reporting period. Specifically, the combined expenses of amortization for the lease assets and interest for the lease liabilities are not to be the same as the operating lease payment for each reporting period. Since the effective interest method requires lessees to recognize interest expense at a constant interest rate over the lease term, lessees recognize interest expense at the decreasing amount over the period. Given the periodic constant lease payments over the lease term and a straight-line method for amortization, the combined amortization and interest expenses under the capitalization are higher than the lease payments in earlier lease periods, and lower in later periods. Due to the timing effect of the capitalization on interest expense, the right-to-use model decreases the periodic income measures of EBT's in the earlier lease periods while it increases them in later lease periods. Its impacts on the EBT depend upon what portions of the long-term leased properties are classified as operating leases under the current accounting rules.

H5: The capitalization of operating leases results in greater decrease in EBIT in earlier lease periods for the firms with more intensive long-term leases than for those with less intensive long-term leases.

5. Samples and Measurements of Key Variables

We select two groups of sample firms, experimental and control firms. The experimental firms consist of the firms with operating assets that are largely composed of operating leases under current lease accounting rules. These firms are identified from the industries in which prior studies (Grossman and Grossman, 2010) indicate that the capitalization of operating leases seriously affects financial ratios. We select our experimental firms from the *2011 Compustat Annual Industrial and Research File*. We then use four-digit SIC codes to match the industry. To maintain homogeneity in our sample, we exclude financial firms (SIC Code 6000s) because these firms exhibit different characteristics (e.g., investments, capital structure, etc.). To be consistent with the extant literature, sample firms must have a December fiscal year-end to control for seasonal effects.⁵

We select experimental firms that meet the following conditions in order to control size and to avoid penny stocks: (1) stockholders' equity total (TEQ) is equal to or greater than \$1 million; (2) the market value of equity measured by the multiplication of price close (PRCC_C) by common shares outstanding (CSHO) is equal to or greater than \$10 million; (3) total assets (AT) are equal or greater than \$10 million; (4) total sales (SALE) are equal to or greater than \$10 million; and (5) stock price per share (PRCC_C) is equal to or greater than \$1. Also, to avoid seriously troubled firms in terms of profits, the firms should have a net income scaled by sales (IB/Sale) equal to or greater than -0.5.⁶ Minimum lease payments are collected from the footnotes in the 10-K's, and firms whose minimum lease payments are zero or blank or whose minimum lease payments are not available from 10-K footnotes are excluded.

To select control group firms, we identify two industries that do not overlap with the industries of the experimental group.⁷ One industry is semiconductors & related devices (SIC

⁵Identical firms may show different financial statements of 2009 if their fiscal year-ends are different. Therefore, the procedure to select sample firms with December fiscal year-end, we believe, decreases the probability of confounding inference from empirical findings by mixing different calendar-year firms (Lee, O'Brien, Sivaramakrishnan, 2008).

⁶All those variables are from the Compustat with variable names in parentheses.

⁷Alternatively, we may group a posteriori our sample by the magnitude of operating assets made up of operating leases under current accounting rules. However, we decided to identify a priori our sample firms of experimental

3674) and the other is the electric services industry (SIC 4911). The first industry is selected out of SIC 3000s because SIC 3000s are about one third the sample size in the Compustat universe excluding SIC 4000s and 6000s. The second industry is selected out of the SIC 4000s because about 40% (31 out of 80) experimental group firms belong to SIC 4000s (4011, 4512, and 4812). Then, the selection criteria stated above for the experimental firms are applied to the control firms within the above two industries.

(Insert Table 1 here)

Panel A in Table 1 shows the industry distribution of the experimental and control group firms. Our experimental firms consist of 80 firms from eleven 4-digit SIC industries; 45 firms from retail industries; 13 firms from the airline industry; and 22 firms from other industries. The control group consists of 88 firms: 51 firms from the semiconductors and related devices industry (SIC 3674) and 37 firms from the electric services industry (SIC 4911).

There are three key variables necessary to capitalize operating leases: a lease period, a discount rate, and lease payments. Since the data for the variables are not accessible from public data, these are estimated. We use the number of years for minimum lease payments disclosed in the 10-K footnote for our estimated lease terms. For the lease terms beyond the 5th year, we divide total minimum lease payments beyond the 5th year specified in the notes by the average minimum lease payment calculated using the minimum lease payments over the first five years.⁸

Since in general, firms' discount rates are not disclosed in the notes, we use the discount rates that are estimated based on the 2009 U.S. Treasury yield rate and the firms' proxy measures for the interest spreads. The proxy measures are estimated on the basis of the firms' estimated

and control groups on the basis of the results of prior studies to examine the financial effects of lease capitalization as addressed in our hypotheses. Due to such a sample selection method, the industrial effect may be compounded in our test results.

⁸We divide the amount by two when a firm shows the sum of the operating lease payment schedule of 2010, 2011, i.e., year 1 and year 2, to get the payment of each year. We apply this rule for other period of consecutive years (e.g., for 2011, 2012, or, for 2012, 2013, etc.)

lease terms and the credit rating of the matching industry provided by Reuters' 2009 Corporate Bond Spread tables. We use Reuters' utilities interest spread for the control sample of SIC 4911 (37 firms), Reuters' transportation interest spread for our experimental sample of SIC 4512 (13 firms), and Reuters' industrials interest spread for all other firms. To identify the firm's interest spread, each firm's lease term is matched against Reuters' matching industry maturity. When there is no matched maturity, the interest spread is identified by interpolating the maturity.

Lease payments are assumed to be minimum lease payments disclosed in notes. Since the lease payments beyond the 5th year are disclosed in an aggregated amount, it is necessary to project each of the lease payments beyond the 5th year. We estimate the payments by dividing the aggregated amount by the lease term beyond the 5th year as explained earlier. We assume that each of the lease payments is constant beyond the 5th year.

Panel B in Table 1 summarizes the measures of the three key variables. The Panel shows that the experiment group has a longer lease term period (9.4 years) than the control group (7.0 years). It also shows that lease payments for the experimental group for each of the five years are significantly greater than those of the control group. These results indicate that the experimental firms use more operating leases than do the control firms. Further, Panel B shows that the discount rate of the experimental group (10.4%) is significantly higher than that of the control group (9%), implying that the experimental group's risk is significantly higher than that of the control group.

6. Empirical Results

6.1 Financial Ratio – Pre-Capitalization of Operating Leases

Panel A in Table 2 provides the descriptive statistics on balance sheet accounts and market value for both groups prior to the capitalization of operating leases. These are measured on the basis of 2009 data obtained from the 2011 Compustat annual file. It shows that there are no statistical differences in total assets (AT), total liabilities (LT), market value (MKVALT), and market-to-book value (MTB) measured by dividing market value (MKVALT) by total stockholders' equity (TEQ). However, it shows that the experimental group is higher in a debt-to-assets ratio (DTA) but is lower in a current ratio (CURR) than the control group. The results

show that the firms with a higher debt-to-assets ratio (DTA) or a lower current ratio (CURR) use more operating leases.

(Insert Table 2 here)

Panel B of Table 2 shows sale and profitability measures for both groups prior to the capitalization of operating leases. We do not observe statistically significant differences in profitability measures such as earnings before interest and income taxes (EBIT), earnings before income taxes (EBT= PI, pretax income), and net income (NI) measured as income before extraordinary items (IB). However, sale (Sale) of the experimental group is significantly higher than that of the control group.

6.2 Balance Sheet Effects (H1)

To test H1, we examine the effects of the capitalized operating leases on total liabilities, total assets, and current liabilities. The liabilities effects are measured by (1) measuring the difference (LTDIF0) between post-capitalization total liabilities and pre-capitalization total liabilities and (2) dividing the difference by 2009 total liabilities (LTPCT0). As shown in Table 3, the capitalization increases \$1,325 million in total liabilities of the experimental group while it increases \$279 million for the control group. Also, the table shows that the percentage increase in total liabilities due to capitalization is about 59.8% for the experimental group firms while that of the control firms is 11.1%. Both measures of the liabilities effect are significantly different. Thus, we conclude that the adoption of the right-to-use method would materially affect total liabilities of the firms with intensive operating leases.

Since increased assets (ATDIF0) are equal to increased liabilities (LTDIF0) in the initial adoption year, the effect of the adoption on assets measured by ATDIF0 would be the same as the effect on liability described above. For the second asset effect measure, we use the relative increase in total assets (ATPCT0) which is calculated by dividing the increased total assets by 2009 total assets. As shown in Table 3, the measure (ATPCT0) is lower than the percentage

change in total liabilities (LTPCT0).⁹ The total assets of the experimental group firms increase by about 31.1% while those of the control group do so by 3.1%. Since both measures of the assets effect are statistically significant, we conclude that the adoption of the right-to-use method would materially affect total assets of the firms with intensive operating leases.

(Insert Table 3 here)

We also examine whether the adoption would affect the firms' current liabilities. The adoption would increase the firms' current liabilities. To observe such financial effects, we measure increased current liabilities (LCTDIF0) at the initial adoption by subtracting the interest portion of the 2010 lease payment from the total 2010 lease payment. Then, we measure relative increased current liabilities by dividing LCTDIF0 by the 2009 total current liabilities before the adoption. As shown in Table 3, the experimental group increases by \$124 million in current liabilities (LCTDIF0), representing a 14.5% increase, while the control group increases by \$24 million, representing a 4.2% increase. Since the differences are statistically significant, the adoption would have a material impact on the current liabilities of firms with intensive operating leases.

6.3 Liquidity Effect (H2)

To examine the liquidity effect of the right-to-use model, we obtain the effect of the adoption on the firms' current ratios. The current ratio effect (CURRDIF0) is measured by the difference between a current ratio before adoption and the same ratio after adoption. Since the adoption would increase firms' current liabilities (LCT) but would not affect their current assets (ACT), it would decrease the current ratio. The current ratio effect for the experimental group is compared to that for the control group. Our results, as shown in Table 3, indicate that the current ratio effect (CURRDIF0) between the two groups is not statistically different. The

⁹While increased total liabilities (LTDIF0) is the same as increased total assets (ATDIF0), total liabilities (LT) is not greater than total assets (AT) in general. Therefore, percentage changes in total assets (ATPCT0) are lower than the percentage change in total liabilities (LTPCT0).

same results are obtained when the effect is extended to the next five years, as shown in Table 4.¹⁰ Thus, we conclude that the adoption of the right-to-use model would not affect the firms' liquidity.

6.4 Financial Flexibility Effect (H3)

To test H3, we measure the debt-to-asset ratio effect of the right-to-use model (DTADIF0). The effect is measured at adoption by observing the difference between the debt-to-total assets ratio (DTA) prior to capitalization and the same ratio after capitalization. It is expected that the adoption would increase the ratio since it would increase both the total assets (AT) and total liabilities (LT) by the same amount, where AT is greater than LT. As shown in Table 3, the debt-to-assets ratio effect for the experimental group is significantly higher than that for the control group. We observe the same statistical results when the effect is extended to the next five years, as shown in Table 4. Thus, the adoption of the right-to-use model would materially affect the firms' financial flexibility measured by the debt-to-asset ratio.

(Insert Table 4 here)

6.5 Income Statement Effects (H4 and H5)

To examine the profitability effect of the right-to-use model, we measure earnings before interest and taxes (EBIT) and earnings before taxes (EBT) in each of the five-year period of 2010 to 2014, as well as the five year average. The profitability effect is measured by the difference between profitability measures (EBITDIF and EBT DIF) before adoption and the same measures after adoption.¹¹ Then, such measures are scaled by net sales (EBIT/sale and EBT/sale) to minimize the size effect of the adoption. We also measure profitability by dividing the earning measures by net sales when firms' profit (EBIT, EBT) is positive (Positive_EBITPCT and

¹⁰We find that CURRDIF of the experimental group (-17.3%) in year 5 does not follow the expected declining trend, and its T-value is statistically significant. Such unexpected result is due to outlier effect. The difference becomes statistically insignificant (p-value of 0.205) when firms with CURRDIF between -0.02 to zero are excluded from our sample.

¹¹The difference between post-capitalization EBIT and pre-capitalization EBIT is the difference between operating lease payment and depreciation expense. On the other hand, the difference between pre-capitalization EBT and post-capitalization EBT is the difference between operating lease payment and the sum of depreciation expense and interest expense.

Positive_EBTPCT, respectively) in order to exclude the effect of the loss firms. In measuring the profitability measures, we assume that the capitalized amount of assets is amortized on the straight-line basis and that the interest expense is calculated on the effective interest method.

As shown in Panel B of Table 4, there are statistically significant differences in all profitability measures of EBITDIF and EBITDIF/sale between the experimental group and the control group. On the other hand, we observe that the measure of Positive_EBITPCT is significant in years 3, 4, and in the five-year average, while it is marginally significant for years 1 and 2, and not significant in year 5. Since marginal significant difference in years 1 and 2 may result from the firms with the pre-capitalization EBIT close to zero in the sample (outliers), we exclude the firms with pre-capitalization EBIT less than \$1 million from the sample.¹² The exclusion of such firms results in the significant difference in the measure of Positive_EBITPCT (P-values of 0.004, 0.002, 0.003 for years 1, 2 and 5, respectively). Thus, it is safe to conclude that the adoption of the right-to-use model would significantly increase EBIT of the firms with intensive long-term operating leases.

Panel B in Table 4 shows that the measure of EBITDIF/Sale between the two groups is statistically significant in each of the 5 years as well as in a five-year average. However, we find that EBITDIF between the two groups is marginally significant in years 2 and 3, significant in years 4, 5 and in a five-year average, but insignificant in year 1. Similar results are obtained for the measure of Positive_EBTPCT. As the case of EBIT measures above stated, we carry out further analysis with the sample excluding the firms whose pre-capitalization EBIT's are less than \$1 million. However, our analysis shows that the difference of Positive_EBTPCT remains unchanged.¹³

¹²When pre-capitalization EBIT (denominator) is close to zero, Positive_EBITPCT ratio becomes high. High variance resulted from the difference between these high ratios and other (low) ratios causes the test results insignificant.

¹³We infer that such test results arise from the fact that Positive_EBTPCT's variance is much greater than that of Positive_EBITPCT because EBT is smaller than EBIT. High variance of Positive_EBTPCT, therefore, incurs low statistical significance in Positive_EBTPCT.

Since the various profitability measures of EBIT including the size-scaled profitability ratio (EBIT/Sale), we conclude that H4 is supported by our data. On the other hand, as the mixed results are obtained for the profitability measures of EBT, it appears to be inconclusive on H5. However, since the size-scaled profitability ratio (EBT/Sale) is consistently significant, we conclude that the adoption of the right-to-use model would have significant impacts on the profitability measures of the firms with intensive long-term operating leases.

7 Conclusion

We intend to empirically examine the financial effects of the proposed right-to-use model (or capitalization of operating lease) for lessees with the U.S. public firms. The adoption of the model would have material impacts on current and noncurrent liabilities, as well as on fixed assets of firms whose operating assets are largely dependent upon operating leases under the current lease accounting rules. Thus, we hypothesize that it would have negative effects on the firms' liquidity and financial flexibility. Further, the adoption would have the decomposition and timing effects on earning measures. We hypothesize that it would increase the firms' EBIT (operating earnings before interest and taxes) in earlier periods of the lease term due to the decomposition effect. On the other hand, it would decrease the firms' EBT (operating earnings before taxes) due to the timing effect.

We analyze 80 experimental firms whose significant portion of operating assets are operating leases under the current lease accounting rules and 88 control firms whose significant portion of firms' operating assets are non-operating leases. Our empirical results show that the adoption of the right-to-use model has significant negative effects on the financial flexibility measured by the debt-to-asset ratio, as observed by prior studies. We also find that it has significant effects on the various profitability measures of EBIT and EBT. That is, the adoption would have positive impacts on EBIT for firms with intensive operating leases during the earlier periods of the lease term, while it would have negative impacts on EBT for the same firms. However, our data do not show that it would have significant effects on the liquidity measure of the current ratio.

The results of our study imply that the adoption of the right-to-use model for lessees would have significant economic consequences to the firms with intensive operating leases. That is, the adoption may increase the firms' cost of capital, as the firms' financial flexibility worsens. Further, the results indicate that there may be significant market reactions to the proposed lease accounting rules, since the adoption would have significant impacts on both financial flexibility and profitability of those firms. Thus, the results premise the empirical investigation on the economic consequences of the proposed lease accounting rules and the rules' market reactions.¹⁴

It is worth noting that there are some caveats for this study. First, due to limited data publicly available for projecting capitalized leases, we estimate the capitalized leases utilizing the following assumptions: 1) future lease payments are ones disclosed in the firms' notes within financial statements; 2) the lease payments beyond the 5th year are constant over our estimated extended lease period; 3) the firms' discount rates are the long-term treasury rates adjusted for the firms' risk; 4) the periodic lease payments are made at the end of the year. While our assumptions are considered to be reasonable, the assumptions may considerably deviate from the firms' reality of leases. Second, for our statistical analysis, we assume that our experimental and control groups are homogenous within each group. However, those groups are composed of firms in various industries. As observed in prior studies, there are possible significant financial variations within each group. Further, the financial differences between two groups may represent the industrial effect of lease capitalization since we select our experimental group from eleven 4-digit SIC industries and control group from two industries. Since we do not isolate the industrial effect in our statistical analysis, there may be a compounding effect in our test results.

¹⁴See Lee *et al.* (2011) to find the capital market implication based on different accounting treatments regarding hybrid securities.

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Table 1. Sample Distribution

Panel A. Industry Distribution

Group

SIC	Industry Name	Nob	(%)	YEARSOL	Example firms *
<u>Experiment</u>					
3011	tires & inner tubes	2	1.2	7.5	<i>Goodyear Tire & Rubber Co.</i>
3021	rubber & plastics footwear	2	1.2	7.5	Lacrosse Footwear Inc.
4011	railroads, line-haul operating	7	4.2	9.9	<i>Union Pacific Corp.</i>
4512	air transportation, scheduled	13	7.7	8.2	<i>Delta Air Lines Inc.</i>
4812	radiotelephone communications	11	6.6	8.4	<i>Verizon Communications Inc.</i>
5411	retail-grocery stores	5	3	11	<i>Safeway Inc.</i>
5731	retail-radio, tv& consumer electronics stores	1	0.6	5	Radioshack Corp.
5812	retail-eating places	29	17.3	10.6	<i>Mcdonald's Corp.</i>
5912	retail-drug stores and proprietary stores	4	2.4	8.3	<i>Cvs Caremark Corp.</i>
5940	retail-miscellaneous shopping goods stores	4	2.4	10.8	<i>Office Depot Inc.</i>
5945	retail-hobby, toy & game shops	2	1.2	7	<i>Build-A-Bear Workshop Inc.</i>
Subtotal		80	47.6		
weighted average				9.4	

Control

3674	semiconductors & related devices	51	30.4	5.2	Intel Corp.
4911	electric services	37	22	9.4	Southern Co.

Subtotal	88	52.4	
Weighted Average			7.0
Grand Total	168	100	

Panel B. Discount Rate and Minimum Lease Payment

Group	YEARSOL	Discount rate	OpLease 2010	OpLease 2011	OpLease 2012	OpLease 2013	OpLease 2014
Experiment (A)	9.4	0.104	230	212	197	177	160
Control (B)	7	0.090	42	41	32	36	28
Difference (A-B)	2.4	0.013	188	171	165	141	132
T-statistics	3.90***	2.56**	3.82***	3.75***	3.82***	3.54***	3.67***

Note:

Nob is number of observations (firms).

YEARSOL is the average of number of operating lease years.

OpLease2010 (to 2014) is Minimum Operating Lease Payment Schedule in 10-K footnote (in \$ millions).

Italicized example firms are sample firms in Grossman and Grossman (2010).

*, **, ***: Significant at 10, 1, 0.1 percent levels, respectively (one-tailed test).

Table 2.Descriptive Statistics: Major Financial Statement Accounts and Ratios: Comparison between the Experimental Group and Control Group Before the Adoption of Right-to-Use Model for Operating Lease

Panel A: Balance Sheet Accounts and Related Financial Ratios

Variable	Experiment (A)	Control (B)	Difference (A-B)	T-Value
AT	9,423	8,363	1,060	0.32
LT	6,064	5,452	612	0.28
DTA	0.592	0.461	0.132	3.62***
CURR	1.464	3.598	-2.134	-4.70***
MKVALT	6,729	5,472	1,256	0.53
MTB	2.867	2.128	0.739	1.46*

Panel B: Income Statement Accounts and Related Financial Ratios

Variable	Experiment (A)	Control (B)	Difference (A-B)	T-Value
Sale	7,563	3,194	4,369	2.13*
EBIT	713	572	142	0.48
EBIT/Sale	0.08	0.075	0.005	0.21
EBT	446	400	46	0.22
EBT/Sale	0.046	0.046	0	0.01
NI	226	286	-60	-0.49
NI/Sale	0.026	0.025	0.001	0.05

Note

AT: Total assets.

LT: Total liabilities.

DTA: Debt-to-Asset ratio as AT/LT.

CURR: Current ratio measured as ACT / LCT.

MKVALT: Market value of equity (measured by the multiplication of Price Close - Annual – Calendar (PRCC_C) by Common Shares Outstanding (CSHO).

MTB: Market-to-Book value of equity ratio (measured by MKVALT / TEQ, where TEQ is book-value of stockholders' equity).

Sale: Net sales revenue.

EBIT: Earnings before interest and taxes.

EBT: Earnings before tax (= PI: Pretax income).

NI: Net income before extraordinary items (IB in Compustat).

EBIT/Sale, EBT/Sale, NI/Sale are EBIT, EBT, NI scaled by Sale, respectively.

AT, LT, MKVALT, Sale, EBIT, EBT, and NI: Numbers in U\$ million.

Sample sizes are 80 for experimental group, and 88 for control group, respectively.

All variables are obtained from the 2009 financial statements from Compustat 2011 annual file.

*, **, ***: Significant at 10, 1, 0.1 percent levels, respectively (one-tailed test).

Table 3. Changes of Balance Sheet Items in Year Zero (2009) when Adopted Right-to-Use Model (Capitalization of Operating Lease) at the End of Year Zero (2009)

Variable	Experiment (A)	Control (B)	Difference (A-B)	T-Value
ATPCT0	0.311	0.031	0.280	10.44***
NACTPCT0	0.501	0.101	0.400	7.34***
LTDIF0	1,325	279	1,046	3.14**
LTPCT0	0.598	0.111	0.487	7.89***
NLCTDIF0	1,201	255	946	3.07**
NLCTPCT0	1.286	0.803	0.482	1.29*
LCTDIF0	124	24	100	3.55***
LCTPCT0	0.145	0.042	0.103	8.75***
DTADIF0	0.086	0.015	0.071	8.63***
CURRDIF0	-0.179	-0.193	0.014	0.30

Note

ATPCT0 = ATDIF0 / AT (assets total), where ATDIF0 is assets total difference between the post-capitalization and pre-capitalization at year-zero (2009).

NACTPCT0 = NACTDIF0 / NACT (non-current assets total), where NACTDIF0 is non-current assets total difference between the post-capitalization and pre-capitalization at year-zero (2009).

LTDIF0: The change in total liabilities due to capitalization at 2009 year-end.

LTPCT0 = LTDIF0 / LT (liabilities total).

NLCTDIF0: The difference between post-capitalization non-current liabilities total and pre-capitalization non-current liabilities total, at 2009 year-end.

NLCTPCT0 = NLCTDIF0 / NLCT (non-current liabilities total).

LCTDIF0: The difference between post-capitalization current liabilities total and pre-capitalization current liabilities total, at 2009 year-end.

LCTPCT0 = LCTDIF0 / LCT (current liabilities total).

DTADIF0: The difference between post-capitalization debt-to-assets (DTA) and pre-capitalization debt-to-assets at 2009 year-end. Post-capitalization debt-to-assets is calculated as follows: $(LT + LTDIF0) / (AT + ATDIF0)$.

CURRDIF0: The difference between post-capitalization current ratio (CURR) and pre-capitalization current ratio at 2009 year-end. Post-capitalization current ratio is calculated as follows: $(ACT) / (LCT + LCTDIF0)$.

LTDIF0, NLCTDIF, and LCTDIF: Numbers in US\$ million.

*, **, ***: Significant at 10, 1, 0.1 percent levels, respectively (one-tailed test).

Table 4. Changes of Balance Sheet Items and Income Statement Items in Year One (2010) to Five (2014) when Adopted Right-to-Use Model (Capitalization of Operating Lease) at the End of Year - Zero (2009)

Panel A. Changes of Balance Sheet Items and Related Financial Ratio

<u>Variable</u>	<u>Group</u>	<u>Year1</u> <u>(2010)</u>	<u>Year2</u> <u>(2011)</u>	<u>Year3</u> <u>(2012)</u>	<u>Year4</u> <u>(2013)</u>	<u>Year5</u> <u>(2014)</u>	<u>5 Year</u> <u>Average</u> <u>(2010-4)</u>
ATPCT	Experiment (A)	0.279	0.244	0.208	0.174	0.138	0.209
	Control (B)	0.027	0.022	0.018	0.014	0.01	0.019
	Difference (A-B)	0.252	0.222	0.19	0.161	0.128	0.19
	T-value (A-B)	10.48***	10.51***	10.22***	9.81***	8.56***	21.09***
LTPCT	Experiment (A)	0.540	0.478	0.418	0.364	0.306	0.422
	Control (B)	0.091	0.07	0.054	0.04	0.029	0.058
	Difference (A-B)	0.450	0.408	0.364	0.324	0.278	0.364
	T-value (A-B)	7.94***	8.00***	7.80***	7.50***	6.75***	16.57***
DTADIF	Experiment (A)	0.081	0.075	0.07	0.066	0.061	0.071
	Control (B)	0.012	0.009	0.007	0.006	0.005	0.008
	Difference (A-B)	0.069	0.066	0.063	0.06	0.056	0.063
	T-value (A-B)	8.71***	8.84***	8.75***	8.69***	8.24***	19.20***
CURRDIF	Experiment (A)	-0.160	-0.143	-0.131	-0.123	-0.173	-0.146
	Control (B)	-0.179	-0.14	-0.112	-0.09	-0.070	-0.116
	Difference (A-B)	0.019	-0.004	-0.019	-0.033	-0.103	-0.030
	T-value (A-B)	0.48	-0.09	-0.44	-0.77	-4.37***	-1.71*

Panel B. Changes of Income Statement Items and Related Financial Ratio

<u>Variable</u>	<u>Group</u>	<u>Year1</u> <u>(2010)</u>	<u>Year2</u> <u>(2011)</u>	<u>Year3</u> <u>(2012)</u>	<u>Year4</u> <u>(2013)</u>	<u>Year5</u> <u>(2014)</u>	<u>5 Year</u> <u>Average</u> <u>(2010-4)</u>
EBITDIF	Experiment (A)	100.5	82.1	66.6	47.7	30.2	65.6
	Control (B)	17.0	16.0	6.7	11.8	3.4	11.3
	Difference (A-B)	83.5	66.2	59.9	35.8	26.8	54.3
	T-value (A-B)	3.98***	3.83***	3.87***	2.68**	2.42**	7.41***
Positive_ EBITPCT	Experiment (A)	1.816	1.076	0.535	0.444	0.173	0.812
	Control (B)	0.063	0.038	0.005	0.008	-0.012	0.021
	Difference (A-B)	1.753	1.038	0.530	0.436	0.185	0.791
	T-value (A-B)	1.40*	1.78*	3.44***	3.23***	1.16	2.74**
EBITDIF/Sale	Experiment (A)	0.025	0.021	0.018	0.014	0.011	0.018
	Control (B)	0.007	0.005	0.002	0.002	0.000	0.003
	Difference (A-B)	0.018	0.016	0.016	0.013	0.011	0.015
	T-value (A-B)	8.47***	8.28***	8.01***	6.15***	5.34***	15.43***
EBTDIF	Experiment (A)	-6.3	-14.9	-21.3	-32.5	-41.7	-23.3
	Control (B)	-1.1	-0.5	-8.7	-3.2	-11.3	-4.7
	Difference (A-B)	-5.2	-14.4	-12.7	-29.3	-30.4	-18.6
	T-value (A-B)	-0.68	-2.01*	-2.24*	-3.97***	-2.88**	-5.29***
Positive_EBTPCT	Experiment (A)	-0.106	-0.154	-0.228	-0.330	-0.370	-0.237
	Control (B)	0.029	0.018	-0.031	-0.012	-0.058	-0.009
	Difference (A-B)	-0.135	-0.172	-0.197	-0.318	-0.312	-0.228
	T-value (A-B)	-1.16	-2.12*	-2.08*	-2.37**	-2.03*	-4.33***
EBTDIF/Sale	Experiment (A)	-0.003	-0.005	-0.005	-0.007	-0.008	-0.006
	Control (B)	0.002	0.000	-0.002	-0.002	-0.003	-0.001

Difference (A-B)	-0.005	-0.005	-0.003	-0.005	-0.005	-0.005
T-value (A-B)	-3.72***	-5.54***	-4.15***	-5.87***	-5.75***	-10.51***

Note

ATPCT = ATDIF / AT (assets total), where ATDIF is assets total difference between the post-capitalization and pre-capitalization of the corresponding year-end.

LTPCT = LTDIF / LT (liabilities total), where LTDIF is liabilities total difference between the post-capitalization and pre-capitalization of the corresponding year-end.

DTADIF: The difference between post-capitalization debt-to-assets (DTA) and pre-capitalization one. Post-capitalization debt-to-assets is calculated as follows: $(LT + LTDIF) / (AT + ATDIF)$ where ATDIF (LTDIF) is assets total (liabilities total) difference between the post-capitalization and pre-capitalization of the corresponding year-end.

CURRDIF: The difference between post-capitalization current ratio (CURR) and pre-capitalization current ratio. Post-capitalization current ratio is calculated as follows: $(ACT) / (LCT + LCTDIF)$, where

EBITDIF: EBIT difference between the post-capitalization and pre-capitalization of the corresponding year-end.

Positive_EBITPCT: EBITDIF/positive EBIT prior to capitalization.

EBITDIF/Sale: EBIT difference between the post-capitalization and pre-capitalization of the corresponding year-end, scaled by Sale (2009 net sales revenue).

EBTDIF: EBT difference between the post-capitalization and pre-capitalization of the corresponding year-end.

Positive_EBTPCT: EBTDIF/positive EBT prior to capitalization.

EBTDIF/Sale: EBT difference between the post-capitalization and pre-capitalization of the corresponding year-end, scaled by Sale (2009 net sales revenue).

EBITDIF, EBTDIF: Numbers in U\$ million.

*, **, ***: Significant at 10, 1, 0.1 percent levels, respectively (one-tailed test).

