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## The Effects of Listing Status on a Firm's Lease Accounting: Evidence from South Korea

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**Abstract:** This study examines how the listing status affects a firm's choice of lease accounting, using 7,023 firm-year observations that record either an operating or a capital lease from 2001 to 2013 in Korea. This research findings that unlisted firms are more likely to opt for operating leases, and to have a higher ratio of operating leases than listed firms are. These results indicate that unlisted firms tend to prefer operating leases which can be used as a tool to avoid increasing debt levels and to benefit from off-balance sheet financing (or unrecorded liabilities), compared to listed firms. This study contributes to the current accounting literature as it is the first to provide empirical evidence regarding the impact of the listing status on a firm's lease accounting.

**Abstrak:** Studi ini meneliti bagaimana status perusahaan yang terdaftar di bursa mempengaruhi pilihan perusahaan atas akuntansi sewa guna, dengan menggunakan observasi tahunan terhadap 7,023 perusahaan yang mencatat sewa pengoperasian atau sewa pembiayaan dari 2001 sampai 2013 di Korea. Riset ini menemukan bahwa perusahaan yang tidak terdaftar lebih mungkin untuk memilih sewa pengoperasian, serta memiliki rasio sewa pengoperasian yang lebih tinggi dibanding perusahaan yang terdaftar. Hasil ini menunjukkan bahwa perusahaan-perusahaan yang tidak terdaftar cenderung lebih memilih sewa pengoperasian yang dapat digunakan sebagai alat untuk menghindari peningkatan tingkat utang dan untuk mendapatkan keuntungan dari pembiayaan luar neraca (atau kewajiban yang tidak tercatat), dibandingkan dengan perusahaan yang terdaftar. Penelitian ini berkontribusi pada literatur akuntansi saat ini karena merupakan yang pertama dalam memberikan bukti empiris mengenai dampak status terdaftar pada akuntansi sewa guna perusahaan.

**Keywords:** capital lease; lease accounting; listing status; operating lease; ratio of operating lease

**JEL classification:** M40, M41

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## Introduction

This study investigates the impact of the listing status on a firm's choice between an operating and capital lease for its lease accounting, as well as on the ratio of operating leases as a lessee. A lease contract is referred to as a transaction in which the lessee agrees to use a property owned by lessor for a specified period by providing regular payments. Under the current accounting standards, firms have two accounting methods available for lease transactions: Capital leases and operating leases. For a capital lease, both a leased asset and a lease liability are recorded in the books, with depreciation and interest expenses recognized during the term of the lease. In contrast, for an operating lease, no assets or liabilities are recognized, while only the lease payments are recognized as operating expenses in the income statements. Unlike a capital lease, an operating lease does not increase the debt level and can conceal liabilities that would be recognized when using a capital lease. These are the effects of so-called "off-balance sheet financing (off-balance sheet lease)" or "unrecorded liability." Choosing an operating lease over a capital lease can distort key financial ratios, especially those using total liability as the denominator, such as the debt-equity ratio, and make them appear lower than they would be if recorded by a capital lease. If investors, especially lenders, are not aware of these two lease accounting methods, firms can lower their cost of borrowing or avoid debt covenants by choosing operating leases for certain lease transactions. It is also possible that firms can create favorable lease terms and manipulate investors. To prevent firms' opportunistic behavior through lease accounting, the International Accounting Standards Board (IASB) set out new International Fi-

ancial Reporting Standards (IFRS) for lease transactions, that take effect in 2019 and require that firms recognize any lease with a term of more than 12 months, except those with low-value underlying assets, as a capital lease.

Once firms list their shares on an official stock exchange, they must abide by strict accounting information disclosure regulations because their stocks and bonds are traded publicly on the capital markets. In contrast, unlisted firms are often family-run, small sized companies, owned by the CEO (Chaney et al. 2004), and usually rely on private borrowing since their shares are not traded on a public market. Consequently, unlisted companies are likely to feel less pressure from the regulations and capital markets for disclosures, and may provide lower quality financial reports (Hope et al. 2013). In Korea, accounting standards can also vary depending on the firm's listing status. As Korea mandatorily adopted the Korean version of IFRS (K-IFRS) in 2011, all listed firms have had to follow K-IFRS from then. However, unlisted firms can choose between the old Korean Accounting Standards (K-GAAP) or the new standards (K-IFRS), resulting in dual accounting standards for unlisted firms. According to the Financial Supervisory Service (2012), 1,142 unlisted firms (6.7%) voluntarily adopted K-IFRS, whereas 16,027 chose K-GAAP (93.3%) in 2011. With the revision of K-IFRS in 2019, lease accounting, from the perspective of a lessee accounting for listed firms, is expected to improve. However, most unlisted firms that use K-GAAP may have the opportunity to use an off-balance sheet lease.

A firm's listing status has a significant impact on the firm's ownership, financial structures, and accounting standards, which can affect the accounting for lease transac-

tions. However, there are no previous studies into the relationship between the listing status and the choice of the lease accounting method. This study fills this gap in the accounting research by investigating how the listing status affects the lease accounting. Based on the discussion above, we predict that unlisted firms are likely to prefer operating leases, to allow them to benefit from the effects of an unrecorded liability; and we find that unlisted firms not only prefer operating leases more than listed firms do, but also have a higher ratio of operating leases.

The remainder of this paper is organized as follows: Section 2 discusses the institutional background and the related literature, and derives the hypotheses. Section 3 presents the research design, followed by the results in Section 4. Finally, Section 5 concludes this study.

## Background, Literature Review, and Hypothesis Development

South Korea established its accounting standards for leases in 1985 and allowed companies to choose between operating and capital leases for their accounting purposes until 1998. However, having two options for lease accounting could motivate managers to choose the option that benefits their current financial conditions rather than reflect the actual substance of the transactions, which could mislead users of the information as to the firm's financial strength, and also decrease its accounting transparency. To mitigate such problems with lease accounting, Korea tightened the standards twice, in 1998 and 2005, to stipulate that firms should use a capital

lease if the lease transfers the risks to the lessee and an operating lease otherwise. Despite these revisions, problems stemming from the choice of two alternative accounting methods for lease transactions remain. First, a firm may choose the accounting option that does not sufficiently reflect the substance of the company, thus decreasing comparability between firms. Moreover, managers may use their discretion on lease accounting, to benefit from the effect of an unrecorded liability (or off-balance sheet financing). In response, the IASB issued new standards for lease accounting (IFRS 16: Leases) effective in 2019, which obliges firms to record all their relevant assets and debts on their balance sheet when signing a lease contract for production, operation, or equipment.<sup>1</sup> Since listed firms must prepare their financial statements under IFRS after the mandatory adoption of IFRS in 2011, lease accounting for listed firms should improve in the near future. However, since unlisted firms are not required to adopt IFRS, they can choose between the local Korean GAAP and IFRS, and thus choose between operating and capital lease accounting. The difference in applied accounting standards between listed and unlisted firms may lead to differences in their lease accounting due to the firms' listing status.

There are two streams of prior literature related to this study. The first is the literature on lease accounting. Watts and Zimmerman (1986) argue that the higher a firm's debt to equity ratio is, the more often the firm will choose the lease accounting method, which results in a higher income since a higher debt to equity ratio worsens a company's credit rating and increases the cost of debt (Yoon and Hong 2001). However, the empirical evidence on the relationship

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<sup>1</sup>Korea Accounting Standards Board. <http://www.kasb.or.kr/>

between the debt to equity ratio and lease accounting in Korea is mixed. Some studies, especially those from before 2002, support Watts and Zimmerman's (1986) claim that firms with a high debt to equity ratio choose operating leases to avoid increasing their debt to equity ratios (Lee 1999, Yi 2001, Yoon and Hong 2001). However, recent studies find that firms with lower debt to equity ratios are more likely to choose operating leases and to have a higher ratio of operating leases than firms with higher debt to equity ratios (Shin 2009, 2015). Studies into the theory of taxation find evidence that the choice of lease accounting does not affect the total tax expense (Imhoff et al. 1991, Shawn and Lee 2015). On the contrary, another study shows that at the beginning of a lease term, a capital lease will incur more costs compared to an operating lease, which could motivate firms in higher tax brackets to choose capital leases to defer their tax payments (Lee 1999). Larger firms are more likely to face more regulations or public scrutiny due to political and social interests. Consequently, these firms may choose an accounting method that records lower profits (Watts and Zimmerman 1986, Kim 2008). For lease accounting, such large companies would choose a capital lease to reduce their reported income (Yi 2001, Shin 2009, Shin 2015). Additionally, firms with a higher capital intensity ratio – a measure of corporate size – tend to choose capital leases due to their size and ability to adopt complex accounting treatments (Lee 1999). Similar to Lee (1999), Shin (2009) claims that firms with higher retained earnings, which tend to spend excessively on capital expenditure, prefer capital leases.

Another stream of research examines the effects of the listing status on the quality of the accounting. Several recent studies provide empirical evidence of the difference in

the quality of the financial reporting between listed and unlisted companies (Cloyd et al. 1996, Ball and Shivakumar 2005; Burgstahler et al. 2006, Hope et al. 2013; Nam 2010). Cloyd et al. (1996) argue that listed firms are motivated to report a higher accounting income due to capital market pressure, whereas unlisted firms have strong incentives to save cash through aggressive tax accounting or tax avoidance, because they face no capital market pressure. Other studies find that unlisted firms use less conservative accounting methods or engage in more earnings' management than listed firms, even after controlling for firm size, debt-equity ratio, and/or auditor characteristics, thus generating lower quality accounting (Ball and Shivakumar 2005; Burgstahler et al. 2006, Hope et al. 2013). They infer that the difference in capital markets' demands for financial information accounting's quality results in differing qualities of financial reporting (Ball and Shivakumar 2005, Hope et al. 2013). Market pressure incentivizes listed firms, whose stocks and bonds are traded publicly on the capital markets, to provide higher quality accounting information. In contrast, unlisted firms face less market pressure and have more room to make decisions that benefit the firms, even if those decisions can lower the quality of their financial reporting (Burgstahler et al. 2006).

Collectively, these results imply that unlisted firms are more likely to manage earnings and use less conservative accounting methods than listed companies (Burgstahler et al. 2006). Similarly, unlisted firms, presumably opportunistically, choose operating leases over capital leases to reduce the impact on the firm's ability to borrow and to benefit from the effect of an unrecorded liability compared to listed firms, leading to this study's main hypotheses:

*Hypothesis 1: Unlisted companies are more likely to choose operating leases than listed companies.*

*Hypothesis 2: Unlisted companies are more likely to have a higher ratio of operating leases than listed companies.*

## Research Design

### Sample

The sample consists of observations collected from the KIS VALUE of the Nice Information Service Co. covering the period from 2001 to 2013<sup>2</sup>, using the following filter rules: (1) The firms must be either listed

firms on the public stock exchange or unlisted firms whose financial statements are audited by an independent external auditor(s); (2) the firms must belong to a non-financial industry; (3) the firms' fiscal year-end must fall in December; (4) the firms must receive an unqualified audit opinion; (5) the firms should not report impaired capital; (6) all necessary financial data must be available; (7) the firms must explicitly record one method for lease transactions since this study compares the effects of the choice between the two lease accounting methods. To avoid mixed effects from the use of operating and capital leases simultaneously, the sample excludes firms that record using both methods. Finally, we winsorize each variable, except for the

Table 1. **Sample Distribution**

<b>Panel A: Sample Selection Process</b>	
Initial sample firms <sup>1</sup> operating in financial industry between 2001–2013 <sup>2</sup>	356,655
Less: firms whose fiscal year-end fall in the month other than December	(17,610)
Less: firms which receive other audit opinions than an unqualified one	(183,823)
Less: firms which record impaired capital	(23,220)
Less: firms which explicitly choose one method for lease transactions between operating and capital lease <sup>3</sup> as well as have no missing calculating values for model variables in Equations (1) & (2)	<b>(124,979)</b>
Final sample	<b>7,023</b>

**Notes:**

- <sup>1</sup> Initial sample consists of firms either listed on the public stock exchange or unlisted whose financial statements are audited by an independent external auditor(s).
- <sup>2</sup> Since firms must have one-year lag data to calculate model variables in the analysis, the initial sample period includes observations from 2000.
- <sup>3</sup> To make effective comparison, we exclude firms that record both lease accounting methods from the sample.

**Panel B: Composition of the Sample(2001–2013)**

<b>Lease Accounting</b>	<b>Listed Firms</b>	<b>Unlisted firms</b>	<b>Total</b>
Operating Lease	377(26.14%)	3,506(62.82%)	3,883(55.29%)
Capital Lease	1,065(73.86%)	2,075(37.18%)	3,140(44.71%)
Total	1,442(100%)	5,581(100%)	7,023(100%)

<sup>2</sup>Since the analyses require lag data, the baseline data range is from 2000 to 2013.

Table 1. *Continued*

Panel C: Industrial Distribution of the Sample (2001–2013)			
Industry	Listed Firms	Unlisted Firms	Total
Manufacturing	845(58.60%)	2,975(53.31%)	3,820(54.39%)
Wholesale & Retail	88(6.10%)	806(14.44%)	894(12.73%)
Construction	45(3.12%)	294(5.27%)	339(4.83%)
Service	288(19.97%)	653(11.70%)	941(13.40%)
Other	176(12.21%)	853(15.28%)	1,029(14.65%)
Total	1,442(100%)	5,581(100%)	7,023(100%)

**Notes:**

Since firms must have one-year lag data to calculate model variables in the analysis, the initial sample period includes observations from 2000.

dummy variables or variables with a natural logarithm transformation, at the top and bottom 1 percent of values, to mitigate the effects of extreme values. The final sample that meets all filtering rules consists of 7,023 firm-years. Panel A of Table 1 summarizes the sample's selection process.

Panels B and C summarize the composition and industrial distribution of the sample. As evident in Panel B, among the 7,023 observations, 1,442 (20.5%) observations belong to listed firms and 5,581 (79.5%) belong to unlisted firms, showing that unlisted firms outnumber listed firms, as reported in previous studies (Burgstahler et al. 2006). The distribution of lease accounting differs by listing status: Most listed firms choose capital leases (73.86%) while unlisted firms prefer operating leases (62.82%). The total sample covers 59 industries, where 54.39 percent (or 3,820), 14.65 percent (or 1,029), 13.4 percent (or 941), and 12.73 percent (or 894) represent the manufacturing, other, services, and wholesale and retail industries, respectively, while less than 10 percent of the total sample represents the construction industry based on Panel B of Table 1. The industry distribution

is generally similar between the two listing statuses, though listed firms tend to be in the service industry (19.97%), while unlisted firms tend to be in wholesale & retail and other industries (12.73% and 14.65%, respectively).

### ***Logistic Regression Model: Hypothesis 1***

To analyze the effect of listing status on lease accounting, we construct the logistic regression model shown in Equation (1). The dependent variable is a dummy for lease accounting, *DL*, equal to one if a firm records with an operating lease, and zero otherwise. Since the dependent variable is a dummy variable, we use a logistic regression model to test Hypothesis 1.

The test variable in Equation (1) is an indicator variable for listing status, *LIST*, equal to one for unlisted firms and zero for listed firms. Previous studies show that unlisted companies tend to make opportunistic decisions more often than listed ones, and provide lower-quality accounting information (Cloyd et al. 1996, Ball and Shivakumar 2005,

Burgstahler et al. 2006, Hope et al. 2013, Nam 2010). Therefore, we predict a significantly positive coefficient on *LIST*.

Equation (1) also includes control variables for factors that are known to affect a firm’s choice of its lease accounting treatment based on previous studies: Leverage (*LEV*), effective tax rate (*TAX*), free cash flow (*FCF*), return on assets (*ROA*), capital intensity (*CI*), size (*SIZE*), earnings management are proxied by performance-adjusted discretionary accruals (*PADA*), and industry and year dummies.

$$DL_i = \alpha_0 + \alpha_1 LIST_i + \alpha_2 LEV_i + \alpha_3 TAX_{i,t} + \alpha_4 FCF_i + \alpha_5 ROA_i + \alpha_6 CI_i + \alpha_7 SIZE_i + \alpha_8 PADA_i + \Sigma IND + \Sigma YD + \varepsilon \dots\dots\dots(1)$$

where,

- DL<sub>i</sub>*: A dummy variable which equals 1 for a firm recording with an operating lease and 0 otherwise
- LIST<sub>i</sub>*: A dummy variable which equals 1 for unlisted firms and 0 for listed firms
- LEV<sub>i</sub>*: Leverage (= total liability/ total asset)
- TAX<sub>i,t</sub>*: Effective income tax rate (= income tax/net income before taxes)
- FCF<sub>i</sub>*: Free cash flow [= ((cash flow from operations)-(cash flow from investing activities))/total asset]
- ROA<sub>i</sub>*: Return on assets (= net income/ total assets)
- CI<sub>i</sub>*: Total assets per capital (natural logarithm of intangible assets divided by the number of employees)

*SIZE<sub>i</sub>*: Firm size (natural logarithm of total asset)

*PADA<sub>i</sub>*: Performance-adjusted discretionary accruals (based on Kothari et al. 2005)

*ΣIND*: Industry dummy

*ΣYD*: Year dummy

*ε*: Error

**Ordinary Lease Square (OLS) Regression Model: Hypothesis 2**

Although Equation (1) can reveal how the listing status affects a firm’s choice of its accounting method for its lease transactions, it does not consider the magnitude of the lease amounts. To test the effects of the listing status on the amounts of the operating leases in terms of the total debt, we build an OLS regression model in Equation (2). We replace the dependent variable in Equation (1), *DL*, with the variable *LEASE* (the ratio of operating leases to total financing). Thus, compared to Equation (1), in which the dependent variable is a firm’s choice of lease accounting method, Equation (2) has a continuous dependent variable. All other variables are identical to those in Equation (1). To control for heteroscedasticity and firm clustering effects, we calculate all *t*-values using robust standard errors following Peterson (2009). As with Equation (1), this study expects a significantly positive coefficient on the test variable *LIST*.

$$LEASE_i = \alpha_0 + \alpha_1 LIST_i + \alpha_2 LEV_i + \alpha_3 TAX_{i,t} + \alpha_4 FCF_i + \alpha_5 ROA_i + \alpha_6 CI_i + \alpha_7 SIZE_i + \alpha_8 PADA_i + \Sigma IND + \Sigma YD + \varepsilon \dots\dots\dots(2)$$

where, *LEASE<sub>i</sub>*: Operating lease level.

We obtain the dependent variable in Equation (2), *LEASE*, following Shin's method (2015). *First*, we measure the financial value of financing from operating leases by the present value of the lease payments, based on the annual 3-year maturity yield rate from the Bank of Korea, as follows:

$$PVOL = \text{Lease payments (reported on the income statement)} \times PVIFA \text{ for a 5-year period,}$$

where PVOL is the Present Value of the Operating Lease payments and PVIFA is the Present Value Interest Factor of Annuity.

*Second*, we calculate the ratio of the operating leases to debt as the ratio of the present value of the operating lease to total debts. Although Shin (2015) defines *LEASE* as the ratio of the present value of the operating lease to total financing (the sum of the total debt and the market value of common stock), we include only the total debts in the denominator since the market value of common stock is not available for unlisted firms:

$$LEASE = \frac{PVOL}{PVOL + \text{total debt}}$$

Table 2. **Descriptive Statistics**

<b>Panel A: Listed firms (N=1,442 observations, sample period = 2001–2013)</b>					
<b>Variable</b>	<b>Mean</b>	<b>Median</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<i>DL</i>	0.261	0.000	0.440	0.000	1.000
<i>LEASE</i>	0.005	0.000	0.016	0.000	0.176
<i>LEV</i>	0.527	0.551	0.187	0.081	0.959
<i>TAX</i>	0.145	0.208	0.314	-1.289	1.007
<i>FCF</i>	0.147	0.126	0.169	-0.359	0.718
<i>ROA</i>	0.035	0.033	0.097	-0.223	0.345
<i>CI</i>	18.839	18.843	1.370	13.615	22.469
<i>SIZE</i>	26.012	25.722	1.684	22.818	29.649
<i>PADA</i>	0.000	0.003	0.083	-0.473	0.323

## Results

### *Descriptive Statistics*

Table 2 reports the descriptive statistics of the key variables in Equations (1) and (2) for listed and unlisted firms in Panels A and B, respectively. For *DL*, listed companies have a mean value of 0.261; that is, on average, 26.1 percent of listed firms choose operating leases. Unlisted firms have a mean value of 0.628; that is, 62.8 percent of unlisted firms choose operating leases. Similarly, the mean for *LEASE* is higher for unlisted firms (0.014) than for listed firms (0.005). These statistics show that unlisted firms choose operating leases more often and have a higher ratio of operating leases compared to listed firms.

We observe differences in the mean values for several variables based on the listing status. For *CI* and *SIZE*, listed firms have a higher mean value compared to unlisted firms (18.839 vs. 18.440 for *CI* and 26.012 vs. 24.247 for *SIZE*). In contrast, the mean values of *LEV*, *TAX*, and *ROA* are larger



Table 2. *Continued***Panel B: Unlisted firms (N=5,581 observations, sample period = 2001–2013)**

Variable	Mean	Median	Std. Dev.	Min	Max
<i>DL</i>	0.628	1.000	0.483	0.000	1.000
<i>LEASE</i>	0.014	0.005	0.026	0.000	0.801
<i>LEV</i>	0.606	0.644	0.203	0.081	0.959
<i>TAX</i>	0.187	0.204	0.249	-1.289	1.007
<i>FCF</i>	0.148	0.127	0.186	-0.359	0.718
<i>ROA</i>	0.050	0.038	0.080	-0.223	0.345
<i>CI</i>	18.440	18.574	1.607	13.615	22.469
<i>SIZE</i>	24.247	23.952	1.065	22.818	29.649
<i>PADA</i>	0.000	0.000	0.094	-0.475	0.460

**Notes:**

*Variables definitions* are as follows:

$DL_t$  = a dummy variable which equals 1 for a firm recording an operating lease and 0 otherwise,  $LIST_t$  = a dummy variable which equals 1 for unlisted firms and 0 for listed firms in year  $t$ ,  $LEV_t$  = leverage (= total liability/ total asset) in year  $t$ ,  $TAX_{t-1}$  = effective income tax rate (= income tax/net income before taxes) in year  $t-1$ ,  $FCF_t$  = free cash flow [= (cash flow from operations) - (cash flow from investing activities)]/total asset] in year  $t$ ,  $ROA_t$  = return on assets (= net income/total assets) in year  $t$ ,  $CI_t$  = total assets per capital (natural logarithm of intangible assets divided by the number of employees) in year  $t$ ,  $SIZE_t$  = firm size (natural logarithm of total asset) in year  $t$ ,  $PADA_t$  = performance adjusted discretionary accruals (based on Kothari et al. 2005) in year  $t$ .

for unlisted firms than for listed firms (0.606 vs. 0.527 for *LEV*, 0.187 vs. 0.145 for *TAX*, and 0.050 vs. 0.035 for *ROA*). The results based on the mean values of each variable by listing status mostly hold when using the median values (See Panels A and B of Table 2).

**Correlation Analysis**

Table 3 shows the Pearson correlations between the main variables in Equations (1) and (2). The results for unlisted companies appear above the diagonal and those for listed companies below the diagonal. The correlation coefficients between the dependent variables *DL* and *LEV*, *CI*, and *SIZE* for listed companies are -0.264, -0.311, and -0.360, respectively, all significant at the 1 percent level. The correlation coefficient between *DL*

and *TAX* is -0.044, significant at the 10 percent level.

On the other hand, the correlation coefficients for unlisted companies between *DL* and *LEASE*, *FCF*, *CI*, and *SIZE* are -0.177, -0.131, -0.120, and -0.342, respectively, all significant at the 1 percent level. The coefficients between *DL* and *TAX* (*ROA*) are 0.058 (0.053), both positive and significant at the 1 percent level.

The correlation coefficients based on *LEASE* are similar to those between *DL* and the other variables. For listed companies, the correlation coefficients between *LEASE* and *LEV*, *CI*, and *SIZE* are -0.278, -0.245, and -0.270, respectively, all significant at the 1 percent level. The correlation coefficient between *LEASE* and *ROA* is 0.080, positive and significant at 1 percent level. For unlisted

Table 3. Correlation Matrix

Variable	<i>DL</i>	<i>LEASE</i>	<i>LEV</i>	<i>TAX</i>	<i>FCF</i>	<i>ROA</i>	<i>CI</i>	<i>SIZE</i>	<i>PADA</i>
<b><i>DL</i></b>	<b>1.000</b>	0.395 (0.000)	-0.177 (0.000)	0.058 (0.000)	-0.131 (0.000)	0.053 (0.000)	-0.120 (0.000)	-0.342 (0.000)	0.024 (0.078)
<b><i>LEASE</i></b>	0.492 (0.000)	<b>1.000</b>	-0.360 (0.000)	0.051 (0.000)	-0.043 (0.001)	0.093 (0.000)	-0.145 (0.000)	-0.252 (0.000)	-0.009 (0.512)
<b><i>LEV</i></b>	-0.264 (0.000)	-0.278 (0.000)	<b>1.000</b>	-0.015 (0.256)	-0.037 (0.006)	-0.353 (0.000)	0.119 (0.000)	0.076 (0.000)	0.036 (0.007)
<b><i>TAX</i></b>	-0.044 (0.094)	-0.038 (0.150)	-0.027 (0.310)	<b>1.000</b>	-0.012 (0.363)	0.033 (0.015)	-0.051 (0.000)	-0.018 (0.174)	0.003 (0.835)
<b><i>FCF</i></b>	0.019 (0.464)	0.034 (0.203)	-0.163 (0.000)	-0.016 (0.538)	<b>1.000</b>	0.343 (0.000)	0.075 (0.000)	0.029 (0.030)	-0.589 (0.000)
<b><i>ROA</i></b>	0.012 (0.658)	0.080 (0.002)	-0.343 (0.000)	0.030 (0.259)	0.396 (0.000)	<b>1.000</b>	-0.117 (0.000)	-0.042 (0.002)	0.004 (0.757)
<b><i>CI</i></b>	-0.311 (0.000)	-0.245 (0.000)	0.352 (0.000)	0.040 (0.124)	-0.119 (0.000)	-0.107 (0.000)	<b>1.000</b>	0.327 (0.000)	0.025 (0.062)
<b><i>SIZE</i></b>	-0.360 (0.000)	-0.270 (0.000)	0.351 (0.000)	0.087 (0.001)	-0.112 (0.000)	-0.048 (0.067)	0.648 (0.000)	<b>1.000</b>	0.021 (0.116)
<b><i>PADA</i></b>	-0.012 (0.662)	-0.030 (0.252)	0.075 (0.005)	-0.009 (0.738)	-0.592 (0.000)	-0.023 (0.390)	0.093 (0.000)	0.024 (0.355)	<b>1.000</b>

**Notes:**

Table 3 reports the Pearson correlation between the main variables. The results for unlisted companies appear above the diagonal and those for listed companies below the diagonal. The corresponding *p*-values appear underneath the correlation coefficients.

Please refer to Table 2 for variable definitions.

companies, the correlation coefficients between *LEASE* and *LEV*, *FCF*, *CI*, and *SIZE* are -0.360, -0.043, -0.145, and -0.252, all significant at the 1 percent level. Those between *LEASE* and *TAX* (*ROA*) are 0.051 (0.093), and positive and significant at the 1 percent level.

### ***Differences in Mean and Median Values***

Table 4 reports the univariate results based on the *t*-test for differences in mean

values and the *Wilcoxon* test for differences in median values of the main variables based on their listing status (listed firms vs unlisted firms) in Panel A, and based on lease accounting (capital lease vs. operating lease) in Panel B. The differences in mean values for *DL*, *Lease*, *LEV*, *TAX*, *ROA*, *CI*, and *SIZE* between listed and unlisted firms in Panel A are -0.367, -0.009, -0.079, -0.042, -0.015, 0.399, and 1.765, respectively, all significant at the 1 percent level. Thus, on average, unlisted firms tend to choose an operating lease more frequently and have higher operating

Table 4. Mean and Median Difference

## Panel A: Listed firms vs. Unlisted firms

Variable	Mean			Median		
	Listed firms	Unlisted firms	Diff. ( <i>t</i> -value)	Listed firms	Unlisted firms	Diff. ( <i>z</i> -value)
<i>DL</i>	0.261	0.628	-0.367***	0.000	1.000	-1.000***
<i>LEASE</i>	0.005	0.014	-0.009***	0.000	0.005	-0.005***
<i>LEV</i>	0.527	0.606	-0.079***	0.551	0.644	-0.093***
<i>TAX</i>	0.145	0.187	-0.042***	0.208	0.204	0.004**
<i>FCF</i>	0.147	0.148	-0.001	0.126	0.127	-0.001
<i>ROA</i>	0.035	0.050	-0.015***	0.033	0.038	-0.005***
<i>CI</i>	18.839	18.440	0.399***	18.843	18.574	0.269***
<i>SIZE</i>	26.012	24.247	1.765***	25.722	23.952	1.770***
<i>PADA</i>	0.000	0.000	0.000	0.003	0.000	0.003
N	1,442	5,581		1,442	5,581	

*Notes:* Mean comparisons and median comparisons are based on *t*-tests and *Wilcoxon* tests, respectively. \*\*\*, \*\*, and \* denote significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

lease levels, leverage, tax rates and performance, while listed firms are likely to be larger and more capital intensive. The results based on differences in the medians are similar to those based on the differences in the means, except for *TAX*. The differences in *DL*, *Lease*, *LEV*, *TAX*, *ROA*, *CI*, and *SIZE* in terms of the median values between listed and unlisted firms are -1.000, -0.005, -0.093, 0.004, -0.005, 0.269, and 1.770, respectively, all significant at the 1 percent level. The exception, *TAX* is significant at the 5 percent level.

The differences in mean and median values between firms choosing capital leases and those choosing operating leases in Panel B are significant at the 1 percent level for all the variables with the exception of one (*PADA*). The differences in mean (median) values for *LIST*, *Lease*, *LEV*, *TAX*, *FCF*, *ROA*, *CI*, and *SIZE* are -0.242 (0.000), -0.021 (-0.012), 0.055 (0.048), -0.028 (-0.008), 0.037 (0.026), -0.011 (-0.008), 0.552 (0.368), and 1.214 (1.062), respectively, all significant at the 1 percent level.

Table 4. *Continued*

## Panel B: Capital Lease vs. Operating Lease

Variable	Mean			Median		
	Capital Lease	Operating Lease	Diff. ( <i>t</i> -value)	Capital Lease	Operating Lease	Diff. ( <i>z</i> -value)
<i>LIST</i>	0.661	0.903	-0.242***	1.000	1.000	0.000***
<i>LEASE</i>	0.000	0.021	-0.021***	0.000	0.012	-0.012***
<i>LEV</i>	0.620	0.565	0.055***	0.643	0.595	0.048***
<i>TAX</i>	0.163	0.191	-0.028***	0.200	0.208	-0.008***
<i>FCF</i>	0.168	0.131	0.037***	0.140	0.114	0.026***
<i>ROA</i>	0.041	0.052	-0.011***	0.032	0.040	-0.008***
<i>CI</i>	18.827	18.275	0.552***	18.847	18.479	0.368***
<i>SIZE</i>	25.280	24.066	1.214***	24.927	23.865	1.062***
<i>PADA</i>	-0.002	0.001	-0.003	0.001	0.000	0.001
N	3,140	3,883		3,140	3,883	

*Notes:* Mean comparisons and median comparisons are based on *t*-tests and Wilcoxon tests, respectively. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

**Logistic Regression Result**

Table 5 shows the logistic regression results after running Equation (1) over 7,023 firm-years.<sup>3</sup> The fitness of Equation (1) is expressed by *Wald X*<sup>2</sup>, which has a value of 1,561.182, significant at the 1 percent level. This shows that this regression model is a good fit.<sup>4</sup> On the other hand, *PseudoR*<sup>2</sup>—which indicates the explanatory power of Equation

(1)—is 33.2 percent. The coefficient estimate on the test variable *LIST* is 0.483, significant at the 1 percent level. This result indicates that unlisted companies are more likely to choose an operating lease compared to listed companies, supporting Hypothesis 1. The results for all the control variables except for *CI* are significant at the 5 percent level or better in the predicted direction. The coefficient estimates on *LEV*, *TAX*, *FCF*, *ROA*,

<sup>3</sup> All regression analyses include industry (“*IND*”) and year dummies (“*YD*”), though for brevity, the results are not reported here.

<sup>4</sup> The un-tabulated results show that the variable with the highest variance influence factor (VIF) in Table 4 is *FCF*, which is 2.014. Statistically, a VIF value of 10 or higher indicates a serious problem with multicollinearity; thus, a multicollinearity problem in this study seems remote.

Table 5. Logistics Regression Results

$$\text{Model: } DL_t = \alpha_0 + \alpha_1 LIST_t + \alpha_2 LEV_t + \alpha_3 TAX_{t-1} + \alpha_4 FCF_t + \alpha_5 ROA_t + \alpha_6 CI_t + \alpha_7 SIZE_t + \alpha_8 PADA_t + \Sigma IND + \Sigma YD + \varepsilon$$

Dependent variable: <i>DL</i>			
Variable	Pred. sign	Coefficient	Wald $X^2$ -value
<i>Intercept</i>	+/-	18.867	521.98***
<i>LIST</i>	+	0.483	28.05***
<i>LEV</i>	+/-	-2.044	146.28***
<i>TAX</i>	+/-	0.508	20.19***
<i>FCF</i>	-	-1.595	49.24***
<i>ROA</i>	+/-	1.235	8.35***
<i>CI</i>	-	0.003	0.02
<i>SIZE</i>	-	-0.768	536.62***
<i>PADA</i>	+/-	-1.027	6.12**
$\Sigma IND$			Included
$\Sigma YD$			Included
<i>Wald <math>X^2</math></i>			1,561.18***
<i>Pseudo <math>R^2</math></i>			0.332
<i>N</i>			7,023

**Notes:**

Explanatory power and fitness of the logistics regression model are expressed by *Pseudo.  $R^2$*  and *Wald  $X^2$* . \*\*\*, \*\* and \* denote significance at 1 percent, 5 percent, 10 percent levels, respectively (two-tailed). Please refer to Table 2 for variable definitions.

*SIZE*, and *PADA* are -2.044, 0.508, -1.595, 1.235, -0.768, and -1.207, respectively, suggesting that firms with lower leverage, a higher tax rate, lower capital intensity, better performance, smaller size, and lower earnings management tend to select operating leases more often than capital leases.

***OLS Regression Result (Cluster-Adjusted)***

Table 6 reports the results based on the cluster-adjusted OLS regression model (Equation (2)).<sup>5</sup> The *F*-value for the model based on Equation (2) is 17.75 and signifi-

<sup>5</sup> All t-values in Table 6 are calculated using robust standard errors to control for heteroskedasticity and firm clustering effects (Petersen 2009).

Table 6. OLS Regression Results (Cluster-Adjusted)

Model: $LEASE_i = a_0 + a_1LIST_i + a_2LEV_i + a_3TAX_{i,t} + a_4FCF_i + a_5ROA_i + a_6CI_i + a_7SIZE_i + a_8PADA_i + \Sigma IND + \Sigma YD + \varepsilon$			
Dependent variable: <i>LEASE</i>			
Variable	Pred. sign	Coefficient	t-value
<i>Intercept</i>	+/-	0.138	13.46***
<i>LIST</i>	+	0.003	2.11**
<i>LEV</i>	+/-	-0.040	-8.77***
<i>TAX</i>	+/-	0.003	3.31***
<i>FCF</i>	-	-0.005	-2.44**
<i>ROA</i>	+/-	-0.003	-0.48
<i>CI</i>	-	-0.001	-1.63
<i>SIZE</i>	-	-0.004	-9.48***
<i>PADA</i>	+/-	-0.004	-0.93
$\Sigma IND$		Included	
$\Sigma YD$		Included	
<i>F-value</i>		17.75***	
<i>Adj. R<sup>2</sup></i>		0.199	
<i>N</i>		7,023	

**Notes:** Explanatory power and fitness of the OLS regression model are expressed by *Adj. R<sup>2</sup>* and *F-value*. \*\*\*, \*\* and \* denote significance at 1%, 5%, 10% levels, respectively (two-tailed).

All *t*-values are reported using robust standard errors to correct any heteroskedasticity problems and firm clustering effects.

Please refer to Table 2 for variable definitions.

cant at the 1 percent level, demonstrating the fitness of Equation (2). The explanatory power of Equation (2), expressed by *Adj. R<sup>2</sup>*, is 19.9 percent. The variable of interest, the coefficient on the test variable *LIST*, is 0.003 and significant at the 5 percent level. The result for the test variable *LIST* reveals that unlisted companies are more likely to have a higher ratio of operating leases to total debt, which supports Hypothesis 2. The results for the control variables are mostly similar to those based on Equation (1), except for *ROA*

and *PADA*. The variables *ROA* and *PADA* become insignificant. The coefficients on *LEV*, *TAX*, *FCF*, and *SIZE* are -0.040, 0.003, -0.005, and -0.004, respectively.

Taken together, we find strong support for both hypotheses. After controlling for factors that affect a firm's lease accounting method, unlisted firms tend to choose operating leases more often than capital leases, compared to listed firms. Furthermore, operating lease level (the ratio of operating leases to total financing) are higher in unlisted firms

than in listed firms. These results may be driven by the characteristics of unlisted firms. Due to the unavailability of financing through selling stocks or bonds in an open public market, unlisted firms tend to depend heavily on debt, especially private debt, which can motivate unlisted firms to choose operating leases more often than capital leases in order to avoid increasing their debt to equity ratio. In addition, a firm's size significantly affects the results; smaller firms are more likely to prefer operating leases to capital leases. Since unlisted firms are in general smaller than listed firms, the results may be partly driven by the small firm size of the unlisted firms.

## Conclusion

This study investigates the effect of the listing status on the choice of the accounting method for lease transactions, and the ratio of operating leases to total debt. Previous studies (Cloyd et al. 1996, Ball and Shivakumar 2005, Nam 2010) found that unlisted companies tend to engage in opportunistic behavior more often than listed firms do, which results in lower-quality financial reporting. Based on these previous studies, we hypothesize that unlisted companies would lean toward operating leases to take advantage of the unrecorded liability effect and have a higher ratio of operating leases. The sample consists of 7,023 firm-year observations that recorded either a capital lease or an operating lease, but not both, over a 13-year period from 2001 to 2013.

From the analyses, we find that unlisted firms are more likely to choose an operating

lease and have a higher ratio of operating leases, supporting both hypotheses. The results reveal that unlisted firms have a much higher tendency to use operating leases compared to listed firms. Considering that unlisted firms tend to have lower accounting quality, this result may imply that unlisted firms may use operating leases as a means of off-balance sheet financing to decrease the cost of borrowing or to meet some debt covenants.

Our findings offer several significant contributions to the current accounting literature. First, the results can help investors, especially lenders, become aware of unrecorded liabilities through lease accounting in unlisted firms. Second, it seems that the current lease accounting rules based on K-GAAP accounting standards for unlisted firms should be revised to adopt the IFRS rules that apply to listed firms. Finally, this study can provide additional empirical evidence on the relationships between firms' listing status and the choice of lease accounting methods for both academics and regulatory bodies.

Although this paper is the first to examine the relationships between listing status and accounting methods for lease transactions, some omitted variables may affect the dependent variables. In addition, this study applied the 3-year term Treasury bond yield rate from the Bank of Korea to calculate the present value of an operating lease rather than using the actual interest rate for borrowings applied to each individual company, which may have reduced the accuracy of the results. However, these limitations are common to most empirical studies.

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