Advances in Accounting xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

Advances in Accounting

journal homepage: www.elsevier.com/locate/adiac

How will the new lease accounting standard affect the relevance of lease asset accounting?

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ABSTRACT

We extend Williamson's (1973, 1987) transaction economics research to leased assets to help explain why some assets are acquired by capital lease and the use of other assets is acquired by operating lease. We look for evidence that capital leases are used for higher asset specificity assets and operating leases are used for lower asset specificity assets. Specifically, we find that returns on capital lease assets exceed the returns on operating lease assets. That the nature of capital lease assets differs from operating lease assets suggests that the lease standard SFAS 13 better categorizes assets under lease. The new lease standard ASU 2016-02 allows only one category for lease assets. From this we conclude that ASU 2016-02 will potentially have an adverse effect on the relevance of lease asset accounting.

1. Introduction

1.1. How leased assets may differ

This study involves the relation between the accounting for leased assets and the underlying nature of leased assets. The study begins by linking the lease accounting categories of capital and operating as specified in SFAS 13 to the Williamson (1973, 1987) conceptual framework of asset specificity. In the Williamson framework, lease accounting categories link to asset specificity because firms will tend to acquire assets with greater asset specificity through lease financing arrangements (capital lease assets) and will obtain the use of assets with lower specificity through rental agreements (operating lease assets). We test the lease accounting link to asset specificity with a sample of firms reporting both capital and operating leases with results generally in support. We discuss the implications of the results in the context of a potential loss of relevant information from the adoption of ASU 2016-02 that requires the capitalization of all non-cancelable long term leases. In particular, the results suggest a potential loss in the relevance of lease asset accounting.

The concept of asset specificity is useful in explaining why firms own certain assets but not others (Williamson 1973, 1987). A specialized stamping machine for a firm producing automobile panels is a common Williamson example of a high specificity asset. In the Williamson context, the firm reduces transaction costs by vertically integrating (by constructing and owning) the stamping machine. The stamping machine is idiosyncratic to the firm as it is crucial to the firm's operations while having little value away from the firm. In contrast, other assets useful to the firm's operations, such as forklifts, are not firm idiosyncratic but rather have generalizable value across many types of firms. Again in the Williamson context, the firm reduces transaction costs with a market transaction to rent the forklift. Ownership is not a benefit over renting for a firm needing the use of a forklift.

It is not controversial that a firm producing automobile panels will be more likely to own the stamping machine and more likely to rent a forklift, all other things being equal. In support, a recent study finds that buildings with higher asset specificity are more likely to be owned and buildings with lower asset specificity are more likely to be leased (Wong, Wong and Jeter 2016). Thus, a firm's method of obtaining the use of an asset will reflect the idiosyncratic nature of the asset to the firm's operations.

We extend the notion that the nature of an asset influences how firms acquire the use of leased assets. The current accounting standard applicable to leases (SFAS No. 13) can be viewed as reflecting the ownership versus renting dichotomy. Under SFAS No. 13, lease contracts that transfer the *"risks and benefits"* (para. 60) inherent in the ownership of property from lessors to lessees are equivalent to asset ownership. Therefore lease arrangements that are fundamentally purchase financing agreements are accounted for as if they are asset purchases (capital lease assets). Lease arrangements that are simply the use of an asset through a rental agreement are accounted as such (operating lease assets). Accordingly, we expect differences between assets recorded as capital leases and assets recorded as operating leases consistent with the tendency of firms to own higher specificity assets and to

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https://doi.org/10.1016/j.adiac.2018.07.004
Received 3 May 2018; Received in revised form 5 July 2018; Accepted 6 July 2018
0882-6110/ © 2018 Published by Elsevier Ltd.

rent lower specificity assets.[1]

We look for differences in asset idiosyncrasies between capital and operating lease assets in a broad sample of firms with both capital and operating leases recorded under SFAS No. 13.[2] We estimate operating lease asset values from the disclosures of future rental payments required by SFAS No. 13. While capital lease assets are recorded under SFAS No. 13, lessee firms are not required to provide values for the assets recorded as operating leases. Thus, we estimate operating lease asset values that would be reported on the balance sheet if the operating leases had been treated as capital leases from their inception. Because there is no widely accepted method of capitalizing operating leases, we employ several alternative methods proposed by prior academic literature (Dhaliwal, Seung, and Neamtiu 2011, Imhoff, Lipe, and Wright 1991, Jennings and Marques 2012 and Graham and King 2013).

Leased assets in the sample account for approximately 19.04% of total net operating assets of which approximately 13% are leases recorded as capital and approximately 87% are leases recorded as operating. The amount and type of leasing varies across the industries represented in the sample in ways consistent with the Williamson context.[3] On average, firms in higher asset specificity industries (e.g., paper and allied product manufacturers, petroleum refining and primary metal industries manufacturers, etc.) have the lowest ratios of leased assets to total property plant and equipment suggesting a propensity to own rather than to lease assets. Also on average, firms in lower asset specificity industries (e.g., miscellaneous retail, apparel and accessory stores and engineering, accounting and management consulting companies) have the highest ratios of leased assets to total property, plant and equipment suggesting a propensity to lease rather than to own assets. In addition, operating leases for firms in retail industries (e.g., apparel and accessory stores, miscellaneous retail stores and eating and drinking places) are the largest proportion of total leased assets. In contrast, operating leases for firms in manufacturing industries (e.g., oil and gas extraction, paper and allied products manufacturers, and electronic and other electrical manufacturers) are the smallest proportion of operating lease assets. Overall, these findings are consistent with firms that have higher asset specificity tend to use leases to finance the acquisition of assets (i.e., capital leases) as well as to own their assets.

Because idiosyncratic assets should have more operating value to a firm, we look for evidence of differences in the operating returns attributable to capital lease assets and operating lease assets. Results of regressions indicate that operating profitability attributable to capital lease assets is significantly greater than operating profitability attributable to operating lease assets. To connect the difference in returns to the Williamson context we introduce measures of asset risk and asset specificity that should affect whether assets are idiosyncratic to firms and therefore the tendency for capital leases. We capture asset risk with a measure of uncertainty, which refers to the uncertainty about the state of nature, such as natural events and technological conditions or the action of other economic actors. We proxy for uncertainty with the volatility of revenues and operating cash flow. We capture asset specificity, which refers to the requirement for specialized/customized production process or facilities to uniquely satisfy a specific market demand. We proxy for asset specificity with measures of industry concentration and capital intensity. Our results show that our measures of uncertainty are related to returns from capital lease assets but not related to returns from operating lease assets. Our results also show that the returns from both capital lease assets and operating lease assets are related to industry concentration but only the returns on capital lease assets are related to capital intensity. Taken together, our results provide support that capital lease assets differ from operating lease assets.

1.2. How ASU 2016-02 could affect relevance

What are the implications for lease accounting if assets accounted for as capital leases and assets accounted for as operating leases fundamentally differ in their nature to the firm? The current accounting standard applicable to leases (SFAS No. 13) allows reporting flexibility to distinguish between idiosyncratic assets as capital and non-idiosyncratic assets as operating.[4] For outside readers of financial statements, the distinction between capital lease assets and operating lease assets may be informative to the extent that knowledge of asset types has relevance. Relevance refers to accounting information that is useful for decision making. Relevance is a preferable accounting quality as accounting usefulness is a fundamental objective for accounting information (FASB Concepts Statement 6). Our results indicating that capital lease assets have higher returns than do operating lease assets suggest the distinction between the two may have relevance.

But there are many criticisms of SFAS No. 13, and in response the FASB has issued ASU 2016-02.[5] ASU 2016-02 eliminates operating lease treatment for all non-cancellable leases that extend over more than one year.[6] In essence, ASU 2016-02 focuses on the similarity in the nature of lease liabilities. All lease obligations are fundamentally similar in that they require future payments of interest and principal. Thus, ASU 2016-02 promotes comparability in debt obligations. Comparability refers to similar economic events measured and reported in a similar manner across different firms. Comparability is a preferable accounting quality because it enables financial statement users to identify the real similarities and differences in economic events

[1] Firms are motivated to lease assets for a variety of reasons including taking advantage of tax benefits and avoiding risks of asset obsolescence (Graham, Lemmon, and Schallheim 1998; Myers, Dill, and Bautista 1976; Smith and Wakeman 1985; Ross, Westerfield, and Jaffe 1996). Regardless of the motivations, we believe higher specificity asset leases will tend to be accounted for as capital leases.

[2] We analyze firms with both capital and operating leases to mitigate potential self-selection issues that can arise when recognition and disclosure do not occur simultaneously (Bratten, Choudhary, and Schipper 2013).

[3] As well as other studies on transaction cost economics and asset specificity (Sutcliffe and Zaheer 1998; Williamson 1973, 1987, Brickley, Smith, Zimmerman, Zhang and Wang 1997, Finucane, 1988, Krishnan and Moyer 1994, Riordan and Williamson 1985 and Wong, Wong, and Jeter 2016).

[4] To assist lessee firms to assess whether risks and benefits of ownership have been substantially obtained, SFAS No. 13 sets forth the following four criteria: (1) ownership is transferred by the end of the lease term; (2) lease term contains a purchase option at a price sufficiently below fair value such that the lessee firm is expected to exercise the option; (3) the lease term equals or exceeds 75% of the lease asset's economic life; and (4) the present value of the lease payments equals or exceeds 90% of the fair value of the asset. If any one of the four criteria is met, a lease is classified as a capital lease, whereby the lessee firm would recognize a lease asset and corresponding liability on the balance sheet. The lease asset is depreciated like any other long-term asset. The lease liability is amortized like debt and the lease payments are separated into interest and principal. A lease that does not meet any of the criteria is classified as an operating lease and payments are expensed.

[5] Critics of SFAS No. 13 note that the four criteria allow firms to structure contracts to avoid recording a capital lease liability (Imhoff and Thomas 1988). It is a compelling argument that SFAS No. 13 allows firms to avoid recording substantial future obligations that are essentially debt-like in all other respects (Bowman 1980). The Securities and Exchange Commission (SEC) estimated that in 2006 approximately 63% of all U.S. issuers report operating leases and a total of $1.25 trillion in undiscounted non-cancelable future cash flow obligations associated with operating leases did not appear on their balance sheets (SEC 2006).

[6] For public lessee firms, ASU 2016-02 will become effective for fiscal years and interim periods within those fiscal years beginning after December 15, 2018. Thus ASU 2016-02 becomes effective January 1, 2019 for lessee firms with calendar year ends.

between firms (Brochet, Jagolinzer and Riedl 2013, De Franco, Kothari and Verdi 2011 and Kim, Kraft and Ryan 2013).

Comparability and relevance are two characteristics of accounting information that, along with reliability and consistency, define high quality accounting information (FASB, 2016a,b). However some accounting standards designed to achieve greater comparability can reduce relevance if the standards restrict firms' ability to reflect their economic idiosyncrasies (Schipper 2003 and Schipper and Vincent 2003). Because lease accounting involves both asset and liability recognition and ASU 2-16-02 forces comparability on both, it is unclear how ASU 2016-02 will ultimately affect the overall relevance of lease accounting. If reporting flexibility under SFAS No. 13 is primarily exploited to avoid debt recognition (Agoglia, Doupnik and Tsakumis 2011, Dye 2002, Nelson, Elliott, Tarpley 2002 and Reither 1998) then ASU 2016-02 will improve relevance. At the same time, if reporting flexibility under SFAS No. 13 conveys information about asset idiosyncrasies (Ahmed 1996, Healy and Palepu 1993, Holthausen 1990, Hunt, Moyer and Shevlin 2000, Sankar and Subramanyam 2001, Schipper 1989 and Subramanyam 1996) then ASU 2016-02 will negatively affect relevance. We provide evidence that under SFAS No. 13, capital lease assets and operating lease assets are economically different. In this regard, we illustrate one of the many challenges that standard setters face when developing accounting standards; in this case the trade-off that can occur between comparability and relevance.

Our paper adds to prior research by providing evidence on the relevance of lease *asset* disclosure under SFAS No. 13. Prior literature documents mixed results on whether market participants consider the accounting for operating lease assets to be relevant (Ge, Imhoff and Lee 2008, Ely 1995 and Dhaliwal, Lee and Neamtiu 2011). On the one hand it may be that market participants are inefficient in their information processing and, consequently, their assessments of risk and return do not fully capture the economic substance of operating lease assets (Daniel, Hirshleifer and Subrahmanyam 1998, Hirshliefer and Teoh 2003, Lakonishok, Shleifer and Vishny 1994 and Schipper 2007). On the other hand, it may be that operating leases represent the use of low idiosyncratic assets that do not have the potential for excess returns. In this regard, the economic substance of operating lease assets cannot influence market participants' assessments of risk and return. The results in this study support the latter interpretation. We provide evidence that the lease assets under capital leases provide more value-relevant information (i.e., greater associations to core operation returns as well as risks) than do assets under operating leases.

We provide a new perspective on lease accounting and, in particular, on ASU 2016-02.[7] ASU 2016-02 will have two distinct effects for financial statement users, one effect relative to lease *liability* accounting and another effect relative to lease *asset* accounting.[8] There is considerable agreement that the comparability and relevance of lease *liability* accounting should improve under ASU 2016-02 (e.g., FASB ASU 2016-02 Section C). Nevertheless, it is unclear how the comparability and relevance of lease *asset* accounting will be affected by ASU 2016-02.

The remainder of the paper is organized as follows: Section 2 presents our research methods, Section 3 presents the results of our analyses and Section 4 presents our concluding remarks.

2. Research methods and data

2.1. Estimating the operating lease asset

While capital lease asset values ($LEASEAT^{Capital}$) are readily obtained from lessee firm balance sheets, operating lease asset values ($LEASEAT^{Operating}$) are not because SFAS No. 13 does not require lessee firms to provide the values for the assets under operating lease accounting. Because capital lease values are calculated as the present value of future minimum capital lease payments, a reasonable estimate of the value of an operating lease asset is also the present value of future minimum operating lease payments.[9] SFAS No. 13 requires data on non-cancelable operating lease commitments for each of the following five years and a summary undiscounted value for the commitments after five years. Following Imhoff, Lipe, and Wright (1991), we assume the summary value over the remainder of the lease term. We estimate the remaining lease term as (*Total commitments after year five*)/(*Year five lease payment*). In effect, the year five commitment becomes an annuity for the remainder of the lease term.[10]

Present values are derived using firm and year specific interest rates calculated by dividing interest expense by total long term debt (current portion included). We set interest rates to the median two-digit SIC code interest rate for the few firms with zero or missing interest expense. Some lessee firms also combine both interest expense and interest income with the result that some interest rates appear abnormally low and some appear abnormally high. Winsorizing interest rates at the 1 and 99 percentiles results in mean and median interest rates of approximately 5%.[11]

2.2. Theoretical model

The purpose of the study is to examine the core operating returns contributed by $LEASEAT^{Capital}$ and $LEASEAT^{Operating}$. We measure core operating returns with return on net operating assets (*RNOA*). Although variations exist (e.g., Penman 2011), prior studies typically examine *RNOA* by studying the relationship between operating income (*OIBDP*) and average net operating assets (*NOA*), such that[12]

$$OIBDP = RNOA \times NOA \quad (1)$$

OIBDP equals operating income before depreciation, rent and interest expense. Depreciation, rent and interest expense are not deducted because they are not independent of the accounting treatment for leased

[7] Note that the focus on lease *asset* accounting is different from the majority of prior research on leases that focus on lease liability accounting (Altamuro, Johnston, Pandit and Zhang 2014, Andrade, Henry and Nanda 2016, Ge, Imhoff and Lee 2008 and Lim, Mann, and Mihov 2014).

[8] Our distinction between the relevance of lease *asset* disclosure and the relevance of lease *liability* disclosure parallels prior literature that distinguish operating risk and financing risk (Ely 1995, Dhaliwal, Lee and Neamtiu 2011 and Nissim and Penman 2001, 2003).

[9] Some lease terms include guaranteed residual values. Guaranteed residual values are considered a part of the minimum lease payments present valued to obtain capital lease asset values. SFAS No. 13 does not require firms to disclose guaranteed residuals for operating leases. Due to this inconsistent disclosure requirement, our estimate of operating lease asset may not necessarily represent the 'true' operating lease assets.

[10] As shown in Graham and King (2013), it is common that the values of the minimum lease payments decline over the life of lease. Therefore, in an untabulated analysis, we deploy two alternative methods to allocate the fifth year summary value to future years. First, we assume a 10% decline in lease payments after year five. Second, we allocate the summary value based on a sum-of-the-years' digits procedure. Compared to the fifth year annuity, the alternative methods result in larger asset estimates as amounts are moved to earlier years. Our statistical inferences are insensitive to these alternatives.

[11] We test the sensitivity of our main results with three alternative discount rate measurements. First, consistent with Dhaliwal, Seung, and Neamtiu (2011) and Jennings and Marques (2012), we set the discount rate at 10% for all the firm-year observations in our sample. Second, we use annual Moody's AAA corporate bond interest rate, ranging from 3.67% to 7.62% over the sample period (http://www.federalreserve.gov/releases/h15/data.htm). Third, we employ industrial average interest rate based on three-digit SIC codes. The results do not qualitatively change with respect the above alternative measurements.

[12] See the Appendix for detailed variable definitions.

assets. *NOA* equals operating assets including property, plant and equipment, capital lease assets and estimated operating lease assets (i.e., $LEASEAT^{Operating}$) less operating liabilities. *NOA* is calculated by reformatting the balance sheet so that operating activities are separated from financing activities. Reformatting the balance sheet facilitates separation of operating performance from financing performance (Penman, 2011). All balance sheet items are calculated as yearly averages ((beginning value + ending value)/2).

To allow rates of return to vary across different types of assets, we disaggregate *NOA* into recorded capital lease assets ($LEASEAT^{Capital}$), estimated operating lease assets ($LEASEAT^{Operating}$), property, plant, and equipment ($PP\&E$) and other operating assets ($OTHERAT$). Disaggregating RNOA into the separate assets and substituting into Eq. (1) yields:

$$OIBDP = \alpha_1 LEASEAT^{Capital} + \alpha_2 LEASEAT^{Operating} + \alpha_3 PP\&E + \alpha_4 OTHERAT \quad (2)$$

Thus by construction, the α parameters represent the accounting rates of return generated by the different assets including recorded assets (i.e., capital lease assets, property plant and equipment, and other assets) and unrecorded assets (i.e., operating lease assets).

2.3. Empirical model

We operationalize Eq. (2) by adding an intercept, scaling by *NOA*, and adding controls for growth prospects (i.e., market-to-book ratio (*MTB*)), firm size (i.e., natural log of net operating assets (*LNOA*)), and industry and year fixed effects such that (firm and time subscripts suppressed for brevity):

$$RNOA = \beta_0\left(\frac{1}{NOA}\right) + \beta_1\left(\frac{LEASEAT^{Capital}}{NOA}\right) + \beta_2\left(\frac{LEASEAT^{Operating}}{NOA}\right) + \beta_3\left(\frac{PP\&E}{NOA}\right) + \beta_4\left(\frac{OTHERAT}{NOA}\right) + \beta_5 MTB + \beta_6 LNOA + Industry\ and\ Year\ Fixed\ Effects \quad (3)$$

The coefficient β_1 on ($LEASEAT^{Capital}/NOA$) represents the average accounting return attributable to capital lease assets and the coefficient β_2 on ($LEASEAT^{Operating}/NOA$) represents the average accounting return attributable to operating lease assets. If capital leases are more likely to be used to acquire idiosyncratic assets than are operating leases, we expect returns attributable to capital lease assets to be greater than returns attributable to operating lease assets (i.e., $\beta_1 > \beta_2$).

2.4. The sample

The sample selection process, summarized in Panel A of Table 1, begins with all observations in the Compustat North America file database over the period from 2000 to 2015. The sample period begins in 2000 because prior to 2000 Compustat did not contain the summary value for operating lease commitments after the fifth year.[13] We exclude firm-years without capital lease assets or five years of future operating lease obligations. For ease of interpretation, we exclude firms-years with negative operating income before depreciation. Finally, we exclude firm-years with missing data or negative values for either net operating assets, net book value of property, plant and equipment, or shareholders' equity. The final sample consists of 13,117 firm-year observations for 2920 firms.

Panel B of Table 1 presents the sample distribution by year and panel C of Table 1 presents the sample distribution by two-digit SIC code industry. Panel B shows that sample observations are distributed evenly over the sample period. The year 2000 has the most observations with 882 and the year 2011 has the least observations with 766. Panel C shows that the sample is reasonably well distributed across industry groups although four industries [business services (10.21%), electronic and other electrical products (6.95%), communications (6.40%) and chemicals and allied products manufacture (6.05%)], comprise almost one-third (29.61%) of the sample. All other individual industry groups contain < 5% of the firm years in the sample.

2.5. Descriptive statistics

Table 2 presents summary statistics for the variables used in the later analyses. Means are larger than medians in all cases suggesting some large values. The mean (median) values equal 0.2704 (0.1944) for return on net operating assets (*RNOA*), 2.7397 (1.9358) for market-to-book ratio (*MTB*) and 6.9849 (6.9339) for the natural log of total net operating assets (*LNOA*). Compared to all firms reported during the sample period on Compustat the sample firms are more profitable (higher *NROA*), have more growth opportunities (higher *MTB* ratio) and report more assets (larger *LNOA*). Turning to our main variables of interest, total lease assets (*LEASEAT/NOA*) equal 19.04% of total net operating assets. Of the 19.04% share of net operating assets, approximately 87% (16.62% / 19.04%) represent operating lease assets ($LEASEAT^{Operating}/NOA$) and 13% (2.42% / 19.04%) represent capital lease assets ($LEASEAT^{Capital}/NOA$).

Fig. 1 presents the ratio of total lease assets (including capital lease assets as reported and operating lease assets as estimated) over property, plant, and equipment excluding capital lease assets. The ratio varies across industries in a manner consistent with Wong, Wong, and Jeter (2016). Firms requiring highly specific assets in their operations are more likely to own, rather than to lease, those assets. Specifically, firms in high asset specificity (more capital intensive) industries (e.g., paper and allied products manufacturers, petroleum refining, and primary metal manufacturers) have the lowest ratio of leased assets to property plant and equipment suggesting a propensity to own rather than lease assets. Firms in low asset specificity (less capital intensive) industries (e.g., miscellaneous retail, apparel & accessory stores, and engineering & accounting & management, etc.) have a greater reliance on lease assets.

Fig. 2 presents the relative magnitude of capital and operating lease assets relative to total capital and operating lease assets for the major industries in our sample. Across all industries > 70% of lease assets are operating lease assets with variation in the percentages in somewhat predictable ways. The lesser asset specificity retail industries (e.g., apparel and accessory stores, miscellaneous retail, and eating and drinking places) have the highest percentages of operating leases. The higher asset specificity manufacturing industries (e.g., oil and gas extraction, paper and allied products manufactures, and electronic and other electrical manufacturers) have the lowest percentages of operating lease assets. Taken together, the two figures are consistent with asset ownership (capital leases) corresponding to industries with firm-idiosyncratic assets, and renting of assets corresponding to industries where assets are not firm-idiosyncratic.

Table 3 presents Pearson correlation coefficients for the variables in Table 3. By construction, the variables ($LEASEAT^{Capital}/NOA$) ($\tau = 0.38$) and ($LEASEAT^{Operating}/NOA$) ($\tau = 0.97$) are positively correlated with (*LEASEAT/NOA*) ($\tau = 0.41$ and $\tau = 0.97$). Only ($LEASEAT^{Capital}/NOA$) and ($LEASEAT^{Operating}/NOA$) appear together in regressions and the correlation coefficient between them equals 0.16. The variables (*OTHERAT/NOA*) and (*MTB*) are also positively correlated with the (*LEASEAT/NOA*) variable ($\tau_p = 0.41$ and $\tau_p = 0.36$), and the variable ($PP\&E/NOA$) is positively correlated with the variable (*LNAT*) ($\tau = 0.33$). No other correlation coefficients are greater than + − 0.20. The primary concern is the potential for collinearity between the explanatory variables affecting statistical inferences of our regression

[13] There is no data related to minimum lease payments after the 5 years of minimum lease payment disclosures for approximately 90% of the cases prior to 2000. Regression results including the small number of firm-year observations prior to year 2000 are qualitatively similar to the results reported later.

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Table 1
Sample selection and sample distribution.

Sample selection procedure	Firm-year observations	distinct firms
Panel A. Sample Selection		
Initial Sample: All firm-year observations in the Compustat North America file over the period 2000 to 2015.	169,108	22,593
Exclude: Firm-year observations without capital lease assets or a minimum of five years of future non-cancelable operating lease obligations disclosed in footnotes to calculate operating lease assets.	(147,383)	(17,622)
Exclude: Firm-year observations with negative operating income before depreciation.	(3570)	(999)
Exclude: Firm-year observations with missing data or negative value of net operating assets, net book value of property, plant, and equipment, or shareholders' equity.	(5038)	(1052)
Final sample	**13,117**	**2920**

Year	n	Percentage	Cumulative percentage
Panel B. Sample distribution by year			
2000	882	6.72	6.72
2001	816	6.22	12.95
2002	772	5.89	18.83
2003	800	6.10	24.93
2004	840	6.40	31.33
2005	824	6.28	37.62
2006	858	6.54	44.16
2007	840	6.40	50.56
2008	835	6.37	56.93
2009	829	6.32	63.25
2010	804	6.13	69.38
2011	766	5.84	75.22
2012	828	6.31	81.53
2013	836	6.37	87.90
2014	818	6.24	94.14
2015	769	5.86	100.00
All years	**13,117**	**100.00**	

Industry	Frequency	Percentage	Cumulative percentage
Panel C. Sample distribution by industry			
Business Services	1339	10.21	10.21
Electronic & Other Electrical	911	6.95	17.16
Communications	840	6.40	23.56
Chemicals & Allied Products Mfrs	794	6.05	29.61
Industrial & Commercial Machine	646	4.92	34.53
Measuring & Analyzing Instrum	586	4.47	39.00
Food & Kindred Products Mfrs	481	3.67	42.67
Health Services	447	3.41	46.08
Eating & Drinking Places	425	3.24	49.32
Miscellaneous Retail	359	2.74	52.06
Transportation Equipment Mfrs	347	2.65	54.71
Wholesale Trade-durable Goods	328	2.50	57.21
Oil & Gas Extraction	304	2.32	59.53
Engineering & Accounting & Mg	285	2.17	61.70
Food Stores	274	2.09	63.79
General Merchandise Stores	268	2.04	65.83
Petroleum Refining & Related	247	1.88	67.71
Transportation By Air	238	1.81	69.52
Electric Gas & Sanitary Service	230	1.75	71.27
Wholesale Trade-nondurable Go	208	1.59	72.86
Paper & Allied Products Mfrs	186	1.42	74.28
Amusement & Recreation Service	179	1.36	75.64
Printing Publishing & Allied	156	1.19	76.83
Fabricated Metal Products Mfr	152	1.16	77.99
Apparel & Other Finished Prod	145	1.11	79.10
Primary Metal Industries Mfrs	142	1.08	80.18
Rubber & Miscellaneous Plastic	140	1.07	81.25
Apparel & Accessory Stores	139	1.06	82.31
Automotive Dealers & Service	139	1.06	83.37
Motor Freight Transportation	135	1.03	84.40
Other Industry	2047	15.59	100.00
All industries	**13,117**	100.00	

Panel A summarizes the sample selection process. Panels B and C report the sample distribution by year and by industry group based on two-digit SIC codes.

Table 2
Descriptive statistics.

Variable	Mean	25th	Median	75th	STD. DEV.
RNOA	0.2704	0.1260	0.1944	0.2999	0.3103
$LEASEAT^{Capital}/NOA$	0.0242	0.0020	0.0068	0.0225	0.0492
$LEASEAT^{Operating}/NOA$	0.1662	0.0356	0.0871	0.2235	0.1940
PP & E/NOA	0.4698	0.1796	0.3882	0.6838	0.3617
OTHERAT/NOA	1.1461	0.4851	0.9725	1.4367	1.2979
MTB	2.7397	1.1828	1.9358	3.2161	2.7994
LNAT	6.9849	5.4348	6.9339	8.5837	2.2581

Notes: This table presents the summary statistics for the variables used in the later regression analyses. *RNOA* equals return on net operating assets,; *NOA* equals net operating assets; $LEASEAT^{Capital}$ equals capital lease assets; $LEASEAT^{Operating}$ equals estimated operating lease assets; *PP & E* equals property, plant and equipment excluding capitalize lease assets; *OTHERAT* equals the remaining other operating assets; *MTB* equals the market-to-book ratio; and *LNOR* equals the natural logarithm of net operating assets.
See the appendix for detailed variable definitions. All continuous variables are winsorized at the 1st and 99th percentiles.

each representing a different version of Eq. (3). Column (1) presents regression results when ($LEASEAT^{Capital}/NOA$) but not ($LEASEAT^{Operating}/NOA$) is included and column (2) presents results when($LEASEAT^{Operating}/NOA$) but not ($LEASEAT^{Capital}/NOA$) is included. The purpose for columns (1) and (2) is to show how ($LEASEAT^{Capital}/NOA$) and ($LEASEAT^{Operating}/NOA$) directly relate to operating profitability, apart from each other. Column (3) reports regression results including both lease variables. The adjusted R^2 is about 62% and the overall model F-statistic exceeds 170 (i.e., is highly significant) for all three regressions.

Columns (1) and (2) show positive and highly significant coefficients on the lease asset variables ($LEASEAT^{Capital}/NOA$) (β_1 = .4655, p-value < 0.01) and ($LEASEAT^{Operating}/NOA$) (β_2 = .0945, p-value < 0.01). The coefficients for both lease asset variables remain positive and highly significant when the variables are included together in the regression shown in column (3) (($LEASEAT^{Capital}/NOA$) (β_1 = .4593, p-value < 0.01) and ($LEASEAT^{Operating}/NOA$) (β_2 = .0916, p-value < 0.01)). F-tests testing for differences between coefficients indicate that

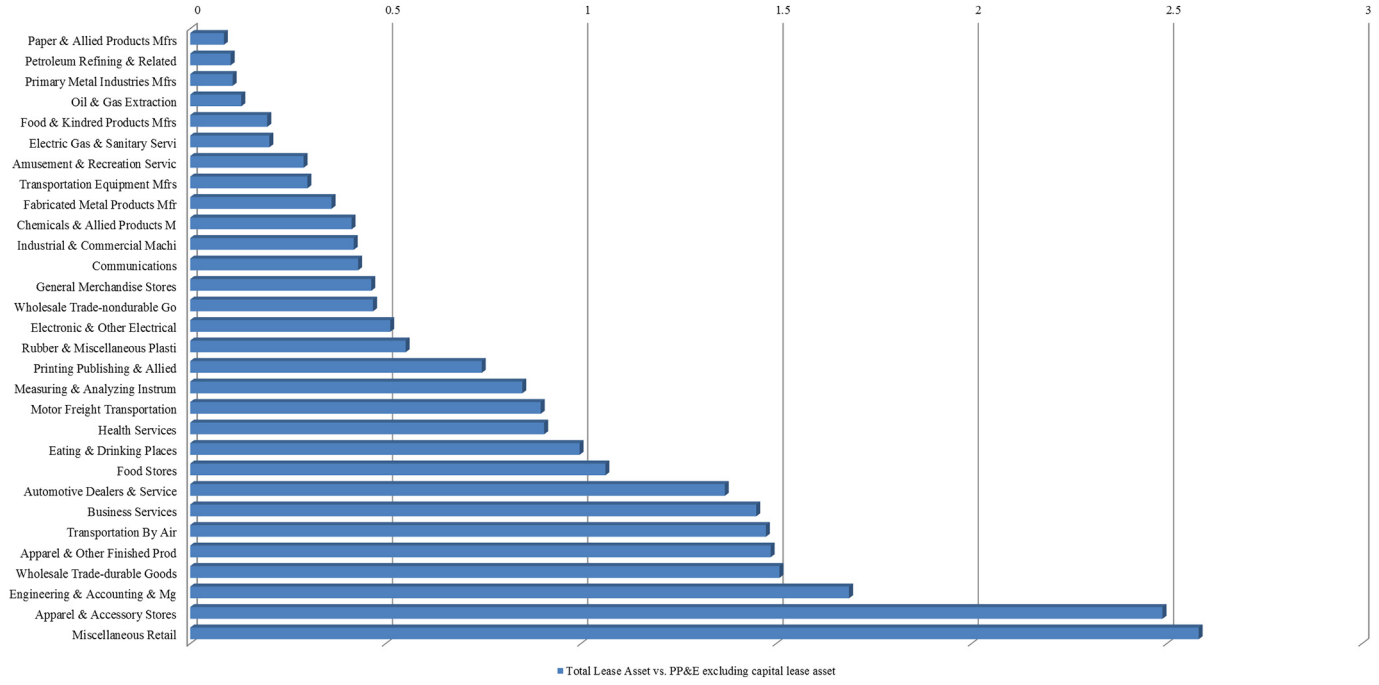

Fig. 1. Total lease assets relative to PP&E.
Note: This figure presents the ratio of total lease assets (including capital lease assets as reported and operating lease assets as estimated) to property, plant and equipment (excluding capital lease assets). Operating lease assets equal the present value of the future minimum operating lease obligations as reported and as estimated after the fifth year.

results. As no correlations between the regression variables exceed 0.41, multicollinearity does not appear to be an issue in our data.

3. Empirical results

3.1. Main results

Main regression results are presented in Table 4, where the significance levels reported are based on standard errors that are adjusted for firm clustering effects and the industry fixed effect is based on two-digit SIC code classification.[14,15] Table 4 reports results in three columns

the β_1 coefficient ($LEASEAT^{Capital}/NOA$) is greater than the β_2 coefficient ($LEASEAT^{Operating}/NOA$) (F = .3677, p-value < 0.01), the β_3 coefficient (*PP & E/NOA*) (F = .3063, p-value < 0.01) and the β_4 coefficient (*OTHERAT/NOA*) (F = .3789, p-value < 0.01). The β_2 coefficient ($LEASEAT^{Operating}/NOA$) is significantly smaller than the β_3 coefficient (*PP & E/NOA*) (F = −.0614, p-value < 0.05) and insignificantly different from the coefficient on property, plant, and equipment (p-value > 0.10), but insignificantly different from the β_4 coefficient (*OTHERAT/NOA*) (F = .0112, p-value > 0.10).

We further test whether the overall fit of the main regression model would be affected if the coefficients on ($LEASEAT^{Capital}/NOA$) and ($LEASEAT^{Operating}/NOA$) are restricted to be equal. The purpose of the

[14] In un-tabulated sensitivity tests, we substitute firm-level clustering and industry and year fixed effects with firm and year fixed effects and industry-level clustering. Our results remain qualitatively unchanged.

[15] Statistical inference remains similar if industry fixed effect is based on

(*footnote continued*)
Fama-French 48 industry classification (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_48_ind_port.html).

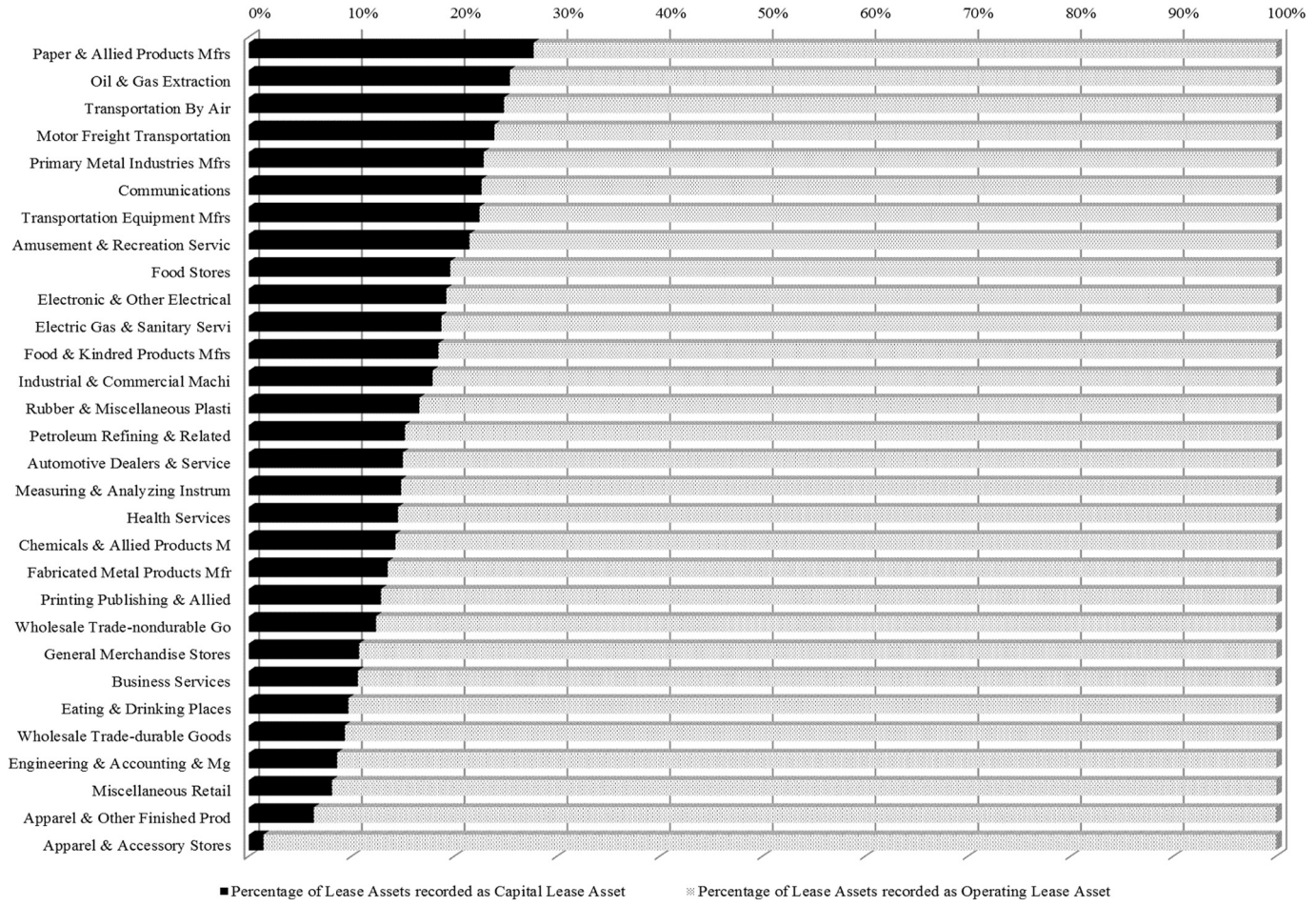

Fig. 2. Capital lease assets relative to operating lease assets.
Note: This figure presents the percentage of total lease assets accounted as capital lease assets as reported and operating lease assets. Operating lease assets equal the present value of the future minimum operating lease obligations as reported and estimated after the fifth year.

Table 3
Pearson correlation coefficients.

	Variable	(1)	(3)	(4)	(5)	(6)	(7)	(8)
(1)	*RNOA*	1.00						
(3)	$LEASEAT^{Capital}/NOA$	0.13***	1.00					
(4)	$LEASEAT^{Operating}/NOA$	0.07***	0.16***	1.00				
(5)	*PP & E/NOA*	0.18***	0.14***	−0.09***	1.00			
(6)	*OTHERAT/NOA*	0.41***	0.06***	0.04***	0.06***	1.00		
(7)	*MTB*	0.36***	0.06***	0.12***	0.03***	0.08***	1.00	
(8)	*LNAT*	0.02*	−0.08***	−0.19***	0.33***	0.06***	0.04***	1.00

Two-Tailed Test: *p < 0.10, **p < 0.05, ***p < 0.01.
Notes: This table presents the summary statistics for the variables used in the later regression analyses. *RNOA* equals return on net operating assets, *NOA* equals net operating assets; $LEASEAT^{Capital}$ equals capital lease assets; $LEASEAT^{Operating}$ equals estimated operating lease assets; *PP & E* equals property, plant and equipment excluding capitalize lease assets; *OTHERAT* equals the remaining other operating assets; *MTB* equals the market-to-book ratio; and *LNOR* equals the natural logarithm of net operating assets.
See the appendix for detailed variable definitions. All continuous variables are winsorized at the 1st and 99th percentiles.

restriction is to test whether the results would be influenced if capital and operating leases were combined as will be required by ASU 2016-02. The un-tabulated results show that the equality restriction negatively affects the overall goodness of fit of the regression (*LR* χ^2 statistics = 51.94, p-value < 0.01) but does not affect the coefficient of determination (R^2).

Overall, the above results indicating that returns generated by capital lease assets and property plant and equipment are greater than returns generated from operating lease assets and other assets suggest that capital lease assets differ from operating lease assets. The results also suggest that capital lease assets differ from property plant and equipment although that may result because property plant and equipment includes is a summary measure of many different types of assets. Returns from operating lease assets appear to generate no greater returns than do other assets. The results also suggest that by allowing only one category of lease assets, the new lease standard could reduce the relevance of lease asset accounting.

Table 4
Contribution to operating profitability from different types of assets.

	Dependent variable = *RNOA*		
	(1)	(2)	(3)
$1/NOA$	−0.1094	−0.0890	−0.1449
$LEASEAT^{Capital}/NOA$	0.4655***		0.4593***
$LEASEAT^{Operating}/NOA$		0.0945***	0.0916***
$PP\&E/NOA$	0.1521***	0.1626***	0.1530***
$OTHERAT/NOA$	0.0826***	0.0820***	0.0804***
MTB	0.0340***	0.0337***	0.0334***
$LNAT$	−0.0117***	−0.0116***	−0.0108***
Industry fixed effect	Incl.	Incl.	Incl.
Year fixed effect	Incl.	Incl.	Incl.
N	13,117	13,117	13,117
F-Statistics (P-value)	179.82 (<0.001)	174.10 (<0.001)	183.10 (<0.001)
R^2	0.6258	0.6243	0.6268
R_{adj}^2	0.6233	0.6219	0.6244
Difference between Coefficient Estimates:			
1) $LEASEAT^{Capital}/NOA - LEASEAT^{Operating}/NOA$			0.3677***
2) $LEASEAT^{Capital}/NOA - PP\&E/NOA$			0.3063***
3) $LEASEAT^{Capital}/NOA - OTHERAT/NOA$			0.3789***
4) $LEASEAT^{Operating}/NOA - PP\&E/NOA$			−0.0614**
5) $LEASEAT^{Operating}/NOA - OTHERAT/NOA$			0.0112

Two-Tailed Test: *p < 0.10, **p < 0.05, ***p < 0.01.
Note: This table reports the results for different version of the following regression models: $NOA = \beta_0\left(\frac{1}{NOA}\right) + \beta_1\left(\frac{LEASEAT^{Capital}}{NOA}\right) + \beta_2\left(\frac{LEASEAT^{Operating}}{NOA}\right) + \beta_3\left(\frac{PP\&E}{NOA}\right) + \beta_4\left(\frac{OTHERAT}{NOA}\right) + \beta_5 MTB + \beta_6 LNAT + Industry\ and\ Year\ Fixed\ Effect$.
We estimate each model using ordinary least square regression and report the results in columns (1) and (2). Standard errors are adjusted for firm clustering effects. *RNOA* equals return on net operating assets, *NOA* equals net operating assets; $LEASEAT^{Capital}$ equals capital lease assets; $LEASEAT^{Operating}$ equals estimated operating lease assets; *PP & E* equals property, plant, and equipment excluding capitalize lease assets; *OTHERAT* equals the remaining other operating assets; *MTB* equals the market-to-book ratio; and *LNOR* equals the natural logarithm of net operating assets.
See the appendix for detailed variable definitions. All continuous variables are winsorized at the 1st and 99th percentiles.

3.2. Ownership risk associated with uncertainty and bargaining power

In this section, we explore whether the results presented in the previous section are accentuated by factors contributing to asset ownership risk. Asset ownership risk is a factor that affects the purchase - rent decision in the transaction economics literature and the Williamson context. Asset ownership risk arises from many interrelated factors and the rational behavior of potential owners and sellers. Consider again the auto stamping machine example. Recall that the stamping machine has little use away from the auto manufacturer. An outside producer of the machine would not want to lease the asset to the manufacturer without a guarantee of a higher return to compensate for the risk that the auto manufacturer will not be successful. From the auto manufacturer's perspective, the higher return demanded by the outside supplier causes asset ownership to be less costly and the return from the machine higher. Consequently, the manufacturer will rationally choose to own the machine outright or acquire through a capital lease (vertically integrate) rather than rent the machine through an operating lease (acquire through the outside market). The opposite is true of the forklift. An outside producer of the forklift does not have asset ownership risk and so does not require a higher return in compensation. Without the added compensation for asset ownership risk the use of the forklift is less costly to the manufacturer if the forklift is rented rather than owned.

3.2.1. Uncertainty

The above example describes asset ownership in terms of the underlying nature of the asset. The specialized machine has different asset specificity qualities than does the forklift. However, asset ownership risk will also be conditioned on characteristics of the manufacturer. For example, the risk that the auto manufacturer will not be successful is a characteristic of the manufacturer contributing to the producer of the machine's asset ownership risk. It follows that the greater the uncertainty about the auto manufacturer's future operations the greater the machine producer's asset ownership risk and consequently the likelihood of buying or leasing.[16] Thus, we expect that asset returns will be associated with firms' uncertainty.

We look for an association between uncertainty and asset returns by

[16] And consequently the likelihood of buying or leasing. In this context, uncertainty refers to the unpredictability of future states of nature including technological innovations and changes in economic factors within the limits of firms successful enough to not be approaching bankruptcy (Sutcliffe and Zaheer 1998, Williamson 1973, 1987). A firm nearing bankruptcy would likely not be able to buy or to lease.

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Table 5
Effect of uncertainty on the asset contributions to operating profitability

	Dependent variable = *RNOA*	
	(1)	(2)
$1/NOA$	−0.1601	−0.1457
$LEASEAT^{Capital}/NOA$	0.1876**	0.2779***
$LEASEAT^{Operating}/NOA$	0.0854***	0.0917***
$UNCERTAIN_{Revenue}$	0.0216*	
$UNCERTAIN_{Revenue} \times (LEASEAT^{Capital}/NOA)$	0.5689***	
$UNCERTAIN_{Revenue} \times (LEASEAT^{Operating}/NOA)$	−0.0027	
$UNCERTAIN_{CashFlow}$		0.0411***
$UNCERTAIN_{CashFlow} \times (LEASEAT^{Capital}/NOA)$		0.3554**
$UNCERTAIN_{CashFlow} \times (LEASEAT^{Operating}/NOA)$		−0.0076
$PP\&E/NOA$	0.1480***	0.1474***
$OTHERAT/NOA$	0.0765***	0.0757***
MTB	0.0329***	0.0327***
$LNAT$	−0.0099***	−0.0085***
Industry fixed effect	Incl.	Incl.
Year fixed effect	Incl.	Incl.
N	13,117	13,117
F-Statistics (P-value)	165.89 (<0.001)	168.91 (<0.001)
R^2	0.6294	0.6300
R_{adj}^2	0.6269	0.6275

Two-Tailed Test: *p < 0.10, **p < 0.05, ***p < 0.01.

Notes: This table reports the results for the following regression model: $RNOA = \beta_0\left(\frac{1}{NOA}\right) + \beta_1\left(\frac{LEASEAT^{Capital}}{NOA}\right) + \beta_2\left(\frac{LEASEAT^{Operating}}{NOA}\right) + \beta_3 UNCERTAIN + \beta_4 UNCERTAIN \times \left(\frac{LEASEAT^{Capital}}{NOA}\right) + \beta_5 UNCERTAIN \times \left(\frac{LEASEAT^{Operating}}{NOA}\right) + \beta_6\left(\frac{PP\&E}{NOA}\right) + \beta_7\left(\frac{OTHERAT}{NOA}\right) + \beta_8 MTB. + \beta_9 LNAT + Industry\ and\ Year\ Fixed\ Effect$

We estimate each model using ordinary least square regression and report the results in columns (1) and (2). Standard errors are adjusted for firm clustering effects. *RNOA* equals return on net operating assets; *NOA* equals net operating assets, $LEASEAT^{Capital}$ equals capital lease assets; $LEASEAT^{Operating}$ equals estimated operating lease assets; *PP & E* equals property, plant and equipment excluding capitalize lease assets; *OTHERAT* equals the remaining other operating assets; *MTB* equals the market-to-book ratio; *LNOR* equals the natural logarithm of net operating assets; and *UNCERTAIN* equals either a sales revenue volatility indicator variable ($UNCERTAIN_{Revenue}$) or a cash flow volatility indicator variable ($UNCERTAIN_{CashFlow}$).
See the appendix for detailed variable definitions. All continuous variables are winsorized at the 1st and 99th percentiles.

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Table 6
Effect of bargaining power on the asset contributions to operating profitability.

	Dependent variable = *RNOA*	
	(1)	(2)
$1/NOA$	−0.1366	−0.1165
$LEASEAT^{Capital}/NOA$	0.3533***	0.2717***
$LEASEAT^{Operating}/NOA$	0.0723**	0.0391
$BARGAIN_{MarketPower}$	−0.0451***	
$BARGAIN_{MarketPower} \times (LEASEAT^{Capital}/NOA)$	0.5242**	
$BARGAIN_{MarketPower} \times (LEASEAT^{Operating}/NOA)$	0.0792**	
$BARGAIN_{GrossMargin}$		0.0241**
$BARGAIN_{GrossMargin} \times (LEASEAT^{Capital}/NOA)$		0.5172***
$BARGAIN_{GrossMargin} \times (LEASEAT^{Operating}/NOA)$		0.3777***
$PP\&E/NOA$	0.1537***	0.1478***
$OTHERAT/NOA$	0.0803***	0.0794***
MTB	0.0332***	0.0303***
$LNAT$	−0.0108***	−0.0146***
Industry fixed effect	Incl.	Incl.
Year fixed effect	Incl.	Incl.
N	13,117	13,117
F-Statistics (P-value)	176.02 (<0.001)	166.87 (<0.001)
R^2	0.6282	0.6435
R_{adj}^2	0.6257	0.6411

Two-Tailed Test: *p < 0.10, **p < 0.05, ***p < 0.01.

Note: This table reports the results for the following regression model: $RNOA = \beta_0\left(\frac{1}{NOA}\right) + \beta_1\left(\frac{LEASEAT^{Capital}}{NOA}\right) + \beta_2\left(\frac{LEASEAT^{Operating}}{NOA}\right) + \beta_3 BARGAIN + \beta_4 BARGAIN \times \left(\frac{LEASEAT^{Capital}}{NOA}\right) + \beta_5 BARGAIN \times \left(\frac{LEASEAT^{Operating}}{NOA}\right) + \beta_6\left(\frac{PP\&E}{NOA}\right) + \beta_7\left(\frac{OTHERAT}{NOA}\right) + \beta_8 MTB + \beta_9 LNAT.$

+ *Industry and Year Fixed Effect*

We estimate each model using ordinary least square regression and report the results in columns (1) and (2). Standard errors are adjusted for firm clustering effects. *RNOA* equals return on net operating assets; *NOA* equals net operating assets; $LEASEAT^{Capital}$ equals capital lease assets; $LEASEAT^{Operating}$ equals estimated operating lease assets; *PP & E* equals property, plant and equipment excluding capitalize lease assets; *OTHERAT* equals the remaining other operating assets; *MTB* equals the market-to-book ratio; *LNOR* equals the natural logarithm of net operating assets; and *BARGAIN* equals either an industry concentration variable ($BARGAIN_{MarketPower}$) or high gross margin variable ($BARGAIN_{GrossMargin}$).

See the appendix for detailed variable definitions. All continuous variables are winsorized at the 1st and 99th percentiles.

modifying Eq. (3) to include future operating uncertainty and interactions with lease assets such that

$$RNOA = \beta_0\left(\frac{1}{NOA}\right) + \beta_1\left(\frac{LEASEAT^{Capital}}{NOA}\right) + \beta_2\left(\frac{LEASEAT^{Operating}}{NOA}\right) + \beta_3 UNCERTAIN + \beta_4 UNCERTAIN \times \left(\frac{LEASEAT^{Capital}}{NOA}\right) + \beta_5 UNCERTAIN \times \left(\frac{LEASEAT^{Operating}}{NOA}\right) + \beta_6\left(\frac{PP\&E}{NOA}\right) + \beta_7\left(\frac{OTHERAT}{NOA}\right) + \beta_8 MTB + \beta_9 LNAT + Industry\ and\ Year\ Fixed\ Effect \quad (4)$$

We proxy for uncertainty with two measures of performance volatility, lessee sales revenue volatility ($UNCERTAIN_{Revenue}$) and lessee cash flow volatility ($UNCERTAIN_{CashFlow}$), and create indicator variables equaling one if the firm is in the highest one-third of the firms in terms of sales or cash flow volatility.

The results from Eq. (4) are presented in Table 5. Column (1) presents results when ($UNCERTAIN_{Revenue}$) is the uncertainty variable and column (2) presents results when ($UNCERTAIN_{CashFlow}$) is the uncertainty variable. Across the two columns, the adjusted R^2 value is approximately 63%, and the overall model F-statistic exceeds 165. Compared to the results in Table 4 of the regressions without uncertainty variables the coefficients on the intercept ($\beta_0 = -0.1601$ and -0.1457, Table 5 vs $\beta_0 = -0.1449$, Table 4), operating lease assets ($\beta_2 = 0.0854$ and 0.0917, Table 5 vs $\beta_2 = 0.0916$, Table 4), PP&E ($\beta_6 = 0.1489$ and 0.1474, Table 5 vs $\beta_3 = 0.1530$, Table 4) and other assets ($\beta_7 = 0.0765$ and 0.0757, Table 5 vs $\beta_4 = 0.0804$, Table 4) are largely similar in magnitude. In addition, the coefficients on capital lease assets are lower and more similar sized to the coefficients on property plant and equipment ($\beta_1 = 0.1876$ and 0.2779 vs 0.1480 for $\beta_6 = 0.1480$ and 0.1474) than was the case in Table 4 ($\beta_1 = 0.4593$ vs $\beta_3 = 0.1480$). Finally, coefficients on the two uncertainty-capital lease asset interaction variables are positive and significant ($\beta_4 = 0.5689$ and 0.3554) while the coefficients on the two uncertainty-operating lease asset interaction variables are negative and insignificant ($\beta_5 = -0.0027$ and -0.0076).

The results shown in Table 5 suggest that uncertainty is connected to the returns from capital lease assets. That connection of uncertainty to capital asset returns suggests additional support that assets under capital lease differ from assets under operating lease, consistent with the Williamson context. As uncertainty in the buying/leasing firm's future operations increases so does the return required by the seller/renter.

3.2.2. Bargaining power

The above results indicate that asset ownership risk is conditioned on characteristics of the asset and on characteristics of the buying/leasing firm. We now consider characteristics of the business relationship between the manufacturer and the supplier. Specifically and again in the Williamson context, we consider the supplier's asset ownership risk when the manufacturer has a stronger bargaining position. We expect that as the manufacturer's bargaining position strengthens the ownership risk for suppliers of high specificity assets will also increase. A manufacturer with bargaining power will reduce the return needed by the supplier to compensate for the ownership risk of an asset with specificity. Consequently the manufacturer's bargaining power can accentuate the risk of ownership for the supplier and therefore the likelihood of transferring the risk to the manufacturer. Thus, consistent with our earlier contentions, we expect that asset returns will be associated with firms' bargaining power.

We look for an association between bargaining power and asset returns by replacing uncertainty in Eq. (4) with bargaining position such that

$$RNOA = \beta_0\left(\frac{1}{NOA}\right) + \beta_1\left(\frac{LEASEAT^{Capital}}{NOA}\right) + \beta_2\left(\frac{LEASEAT^{Operating}}{NOA}\right) + \beta_3 BARGAIN + \beta_4 BARGAIN \times \left(\frac{LEASEAT^{Capital}}{NOA}\right) + \beta_5 BARGAIN \times \left(\frac{LEASEAT^{Operating}}{NOA}\right) + \beta_6\left(\frac{PP\&E}{NOA}\right) + \beta_7\left(\frac{OTHERAT}{NOA}\right) + \beta_8 MTB + \beta_9 LNAT + Industry\ and\ Year\ Fixed\ Effect \quad (5)$$

We proxy for bargaining position with industry dominance ($BARGAIN_{MarketPower}$) and with industry pricing power ($BARGAIN_{GrossMargin}$). We expect that bargaining power will be more likely for the firms with the highest market share in their industry as measured by the Herfindahl-Hirschman Index.[17] We also expect that bargaining power will be more likely for the firms with the highest gross margins in their industry.

The results are presented in Table 6. Column (1) presents results when $BARGAIN_{MarketPower}$ is the bargaining power variable and column (2) presents results when $BARGAIN_{GrossMargin}$ bargaining power variable. The adjusted R^2 value is approximately 63% for the regression shown in column (1) and approximately 64% for the regression shown in column (2). The overall model F-statistic exceeds 167 for both regressions.

The results presented in column (1) of Table 6 indicate that the coefficients on the capital lease asset variable and on the operating lease asset variable are both different from zero ($\beta_1 = 0.3533$ and $\beta_2 = 0.0723$) with both coefficients less than their counterparts in Table 4. Interestingly, both coefficients on the lease assets-market power interaction variables ($\beta_4 = 0.5242$ and $\beta_5 = 0.0792$) are positive and significant suggesting returns on capital lease assets and operating lease assets are higher for firms with bargaining power. An F test (untabulated) indicates that the capital lease asset interaction coefficient is significantly larger than the operating lease asset interaction coefficient. In column (2) of Table 6, the coefficient on the capital lease asset variable is positive and significant ($\beta_1 = 0.2717$) while the coefficient on the operating lease asset variable is positive but not different than zero ($\beta_2 = 0.0391$). Similar to the results shown in column (1) the coefficients on the lease assets bargaining power interaction variables are positive and significantly different from zero ($\beta_4 = 0.5172$ and $\beta_5 = 0.3777$). An F test (untabulated) again indicates that the capital lease asset interaction coefficient is significantly larger than the operating lease asset interaction coefficient.

The results shown in Table 6 suggest that for firms with bargaining power, as measured by relative market share and gross margin, both capital lease assets and operating lease assets have higher returns. However, returns for capital lease assets are higher than for operating lease assets.

4. Concluding remarks

Our results present consistent evidence that returns from capital lease assets exceed returns from operating lease assets. Our results also present consistent evidence that the differences in returns generated by capital lease assets and operating lease assets are related to underlying asset ownership risks. The results support our contention that capital lease assets and operating lease assets have fundamentally different characteristics. Stated differently, under the accounting for leases under

[17] The Herfindahl-Hirschman Index is typically used as a measure of the relative concentration within an industry. The index is calculated by summing the squared market shares of each firm in an industry. We use the Herfindahl-Hirschman Index methodology here to rank firm's market shares within industries.

SFAS No. 13, capital lease accounting reflects a different type of asset than does operating lease accounting.

Our results are important for two reasons. First, the results suggest that lessee lease accounting generally complies with the underlying economic objective of SFAS No. 13. Capital lease accounting, intended to capture when lease agreements are substitutes for asset purchase agreements, appears to do so. Operating lease accounting, intended to capture when lease agreements are essentially rental agreements, also appears to do so. Therefore, the lease accounting procedures of SFAS No. 13 appear to be on average representationally faithful to the underlying economics of leases and, by definition, relevant in providing useful information to investors and creditors. Second, our results also suggest that the new lease standard ASU 2016-02, that allows recording only one leased asset type, will not be on average representationally faithful to the underlying economics of lease assets and therefore less relevant in providing useful information regarding the assets to investors and creditors. However, lease accounting is complicated in that it involves recording leased assets and lease liabilities. The relevance of lease asset accounting under SFAS No. 13 is likely more than offset is lost by the loss of relevance when firms structure lease contracts so as to not report lease liabilities. Consequently, a loss of lease asset relevance under ASU 2016-02, as compared to SFAS No. 13, may be offset by the gain of lease liability relevance.

Appendix A. Appendix

Variable definitions
(by alphabetic order)

Variable	Definition
$LEASEAT^{Capital}$	Yearly average of capital lease assets (COMPUSTAT Item: *DCLO*).
$LEASEAT^{Operating}$	Yearly average of operating lease assets calculated as the present value of the future minimum operating lease obligations as reported (COMPUSTAT Item: *MRC*1 *to MRC*5) and the summary value for obligations after the fifth year (COMPUSTAT Item: *MRCA*). We make an assumption that the firm continues to make lease payments at the year five level for the remainder of the lease term. We estimate the remaining lease term as (*Total payment after year five*)/(*Year five lease payment*). Discount rates are derived using firm and year specific interest rates calculated by dividing interest expense by total long term debt (current portion included). Discount rates are set equal to the median interest rate for the other firms in the same two-digit SIC code if interest expense equals zero or is missing.
LEASEAT	Sum **of**$LEASEAT^{Capital}$ and $LEASEAT^{Operating}$
LNOA	Natural logarithm of the yearly average of total net operating assets.
MTB	Market value of common equity (COMPUSTAT Item: *PRCC_F* × *CSHO*) divided by book value of common equity (COMPUSTAT Item: *CEQ*).
NOA	Yearly average net operating assets (COMPUSTAT Item: *AT* – *CHE* – *ACDO* – *ACODO* – *IVAO* – *ALDO* – *AODO*) minus operating liabilities (COMPUSTAT ITEM: *LT* – *DLC* – *DLTT* – *MIB*) plus $LEASEAT^{Operating}$.
OTHERAT	Yearly average of other assets calculated by subtracting as assets less PP&E and capital lease assets (COMPUSTAT Item: *AT* − *PPENT*).
PP & E	Yearly average property, plant, and equipment less capital lease assets (COMPUSTAT Item: *PPENT* − *DCLO*).
$BARGAIN_{MarketPower}$	An indicator variable equaling one if the value of a firm's SIC two-digit industrial Herfindahl-Hirschman Index is in the upper tercile of the sample and zero otherwise.
$BARGAIN_{GrossMargin}$	An indicator variable equaling one if a firm's gross margin is in the upper tercile of firms in the same two-digit SIC industry and zero otherwise. Gross margin equals one minus cost of goods sold divided by sales (COMPUSTAT Item: COGS/*SALE*).
$UNCERTAIN_{Cash\ Flow}$	An indicator variable that equals one if the five year standard deviation of operating cash flow (COMPUSTAT Item: *OANCF*) scaled by average net operating assets (*NOA*) is in the upper tercile of firms in the same SIC two-digit industry and zero otherwise.
$UNCERTAIN_{Revenue}$	Indicator variable that equals one if the five year standard deviation of sales revenue (COMPUSTAT Item: *SALE*) scaled by average net operating assets (*NOA*) is in the upper tercile of firms in the same SIC two-digit industry and zero otherwise.

References

Agoglia, C. P., Doupnik, T. S., & Tsakumis, G. T. (2011). Principles-based versus rules-based accounting standards: The influence of standard precision and audit committee strength on financial reporting decisions. *The Accounting Review, 86*(3), 747–767.

Ahmed, K. (1996). Disclosure policy choice and corporate characteristics: A study of Bangladesh. *Asia-Pacific Journal of Accounting, 3*(1), 183–203.

Altamuro, J. M., Johnston, R., Pandit, S., & Zhang, H. (2014). Operating leases and credit assessments. *Contemporary Accounting Research, 31*(2), 551–580.

Andrade, S., Henry, E., & Nanda, D. (2016). *The impact of operating leases and purchase obligations on credit market prices.* Working PaperUniversity of Miami.

Bowman, R. (1980). The debt equivalent of leases: An empirical investigation. *The Accounting Review,* (April), 237–252.

Bratten, B., Choudhary, P., & Schipper, K. (2013). Evidence that market participants assess recognized and disclosed items similarly when reliability is not an issue. *The Accounting Review, 88*(4), 1179–1210.

Brickley, J. A., Smith, C. W., Zimmerman, J. L., Zhang, Z., & Wang, C. (1997). *Managerial economics and organizational architecture.* Chicago Ill: Irwin.

Brochet, F., Jagolinzer, A. D., & Riedl, E. J. (2013). Mandatory IFRS adoption and financial statement comparability. *Contemporary Accounting Research, 30*(4), 1373–1400.

Daniel, K., Hirshleifer, D., & Subrahmanyan, A. (1998). Investor psychology and security market under and overreactions. *The Journal of Finance, 53*(6), 1839–1885.

De Franco, G., Kothari, S. P., & Verdi, R. S. (2011). The benefits of financial statement comparability. *Journal of Accounting Research, 49*(4), 895–931.

Dhaliwal, D., Lee, H. S., & Neamtiu, M. (2011). The impact of operating leases on firm financial and operating risk. *Journal of Accounting, Auditing & Finance, 26*(2), 151–197.

Dye, R. A. (2002). Classifications manipulation and Nash accounting standards. *Journal of Accounting Research, 40*(4), 1125–1162.

Ely, K. (1995). Operating lease accounting and the Market's assessment of equity risk. *Journal of Accounting Research, 33*(2), 397–415.

Financial Accounting Standards Board (2016a). *Accounting Standards Update No. 2016-02. Retrieved November 28, 2016, from FASB Accounting Standards Codification database.*

Financial Accounting Standards Board (2016b). *Statements of Financial Accounting Standards No. 13: Accounting for Leases. Retrieved November 28, 2016, from FASB Accounting Standards Codification database.*

Finucane, T. J. (1988). Some empirical evidence on the use of financial leases. *Journal of Financial Research, 11*(4), 321–333.

Ge, W., Imhoff, E., & Lee, L. (2008). *Is recognition of operating leases necessary?* Working paperUniversity of Michigan.

Graham, R. C., & King, R. D. (2013). Decision usefulness of whole-asset operating lease capitalizations. *Advances in Accounting, 29*(1), 60–73.

Graham, J. R., Lemmon, M. L., & Schallheim, J. S. (1998). Debt, leases, taxes, and the endogeneity of corporate tax states. *The Journal of Finance, 53*(1), 131–162.

Healy, P. M., & Palepu, K. G. (1993). The effect of firms' financial disclosure strategies on stock

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prices. *Accounting Horizons, 7*(1), 1–11.
Hirshleifer, D., & Teoh, S. H. (2003). Limited attention, information disclosure, and financial reporting. *Journal of Accounting and Economics, 36*(1–3), 337–386.
Holthausen, R. W. (1990). Accounting method choice: Opportunistic behavior, efficient contracting, and information perspectives. *Journal of Accounting and Economics, 12*(1–3), 207–218.
Hunt, A., Moyer, S., & Shevlin, T. (2000). *Earnings volatility, earnings management, and equity value.* Working PaperUniversity of Washington.
Imhoff, E. A., Jr, Lipe, R. C., & Wright, D. W. (1991). Operating leases: Impact of constructive capitalization. *Accounting Horizons, 5*(1), 51.
Jennings, R., & Marques, A. (2012). Amortized cost for operating lease assets. *Accounting Horizons, 27*(1), 51–74.
Kim, S., Kraft, P., & Ryan, S. G. (2013). Financial statement comparability and credit risk. *Review of Accounting Studies, 18*(3), 783–823.
Krishnan, V. S., & Moyer, C. R. (1994). Bankruptcy costs and the financial leasing decision. *Financial Management, 23*(2), 31–42.
Lakanishok, J., Shleifer, A., & Vishny, R. W. (1994). Contrarian investment, extrapolation, and risk. *The Journal of Finance, 49*(5), 1541–1578.
Lim, S., Mann, S. C., & Mihov, V. T. (2014). *Market recognition of the accounting disclosure and economic benefit of operating leases: Evidence from borrowing costs and credit ratings.* Working PaperTexas Christian University.
Myers, S. C., Dill, D. A., & Bautista, A. J. (1976). Valuation of financial lease assets. *The Journal of Finance, 31*(3), 799–819.
Nelson, M. W., Elliott, J. A., & Tarpley, R. L. (2002). Evidence from auditors about Managers' and Auditors' earnings management decisions. *The Accounting Review, 77*(1), 175–202.
Nissim, D., & Penman, S. H. (2001). Ratio analysis and equity valuation: From research to practice. *Review of Accounting Studies, 6*(1), 109–154.
Nissim, D., & Penman, S. H. (2003). Financial statement analysis of leverage and how it informs about profitability and price-to book ratios. *Review of Accounting Studies, 8*(4), 531–560.
Penman, S. H. (2011). *Financial statement analysis and security valuation.* New York: McGraw-Hill.
Reither, C. L. (1998). What are the best and the worst accounting standards? *Accounting Horizons, 12*(3), 283–292.
Riordan, M. H., & Williamson, O. E. (1985). Asset specificity and economic organization. *International Journal of Industrial Organization, 3*(4), 365–378.
Ross, S. A., Westerfield, R. W., & Jaffe, J. F. (1996). *Corporate finance.* Homewood Il: Irwin.
Sankar, M. R., & Subramanyam, K. R. (2001). Reporting discretion and private information communication through earnings. *Journal of Accounting Research, 39*(2), 365–386.
Schipper, K. (1989). Commentary on earnings management. *Accounting Horizons, 3*(4), 91–102.
Schipper, K. (2003). Principles-based accounting standards. *Accounting Horizons, 17*(1), 61–72.
Schipper, K. (2007). Required disclosures in financial reports. *The Accounting Review, 82*(2), 301–326.
Schipper, K., & Vincent, L. (2003). Earnings quality. *Accounting Horizons, 17*(1), 97–110.
Smith, C. W., Jr., & Wakeman, L. M. (1985). Determinants of corporate leasing policy. *The Journal of Finance, 40*(3), 898–908.
Subramanyam, K. R. (1996). The pricing of discretionary accruals. *Journal of Accounting and Economics, 22*(1), 249–281.
Williamson, O. E. (1973). Markets and hierarchies: Some elementary considerations. *The American Economic Review, 63*(2), 316–325.
Williamson, O. E. (1987). Transaction cost economics: The comparative contracting perspective. *Journal of Economic Behavior & Organization, 8*(4), 617–625.
Wong, J., Wong, N., & Jeter, D. C. (2016). The economics of accounting for property leases. *Accounting Horizons, 30*(2), 239–254.