Did the Recognition of Operating Leases Cause a Decline in Equity Valuations?

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ABSTRACT

We examine whether investors react to a significant change in financial statements absent a significant change in underlying economics. Beginning in 2019, ASC 842 requires the recognition of operating leases, which were previously only disclosed in the footnotes. This change in accounting standard has no effect on firms' economics but results in firms with significant operating leases recognizing a considerable increase in debt. We find that firms with significant operating leases, on average, earn negative returns around the initial recognition of their operating leases. For example, firms above the 95th percentile of operating lease intensity experience a mean abnormal return of -5.50% during the two weeks around their first quarter 2019 earnings announcements. Our results suggest that the higher information processing costs inherent in disclosed versus recognized information can lead to mispricing, even in the case of a common and well-known accounting distortion.

Keywords: fundamental analysis; market efficiency; leases; information processing costs; disclosure versus recognition; financial statement analysis; ASC 842

JEL Classification: G10; G12; G14; M40; M41; M48

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1. Introduction

Off-balance sheet rental commitments represent a longstanding and well-known accounting distortion that requires financial statement users to adjust the reported financial statements for understated debt and understated assets.[1] Beginning in 2019, a change in the lease accounting standard eliminates the need to adjust for unrecognized leases. The new lease accounting standard, ASC 842, requires the recognition (on the balance sheet) of leases that were previously only disclosed in the footnotes to the financial statements (i.e., operating leases). For firms with significant operating leases, this results in a significant increase in both debt and assets along with a worsening in their financial ratios (e.g., debt-to-equity ratio, return on assets, asset turnover, and current ratio). Although this change in accounting disclosure regulation affects firms' balance sheets, it does not affect firms' underlying economics. Thus, this change in accounting standard allows us to examine whether equity investors were adequately adjusting for the use of operating leases prior to ASC 842 as one would expect under the efficient markets hypothesis (e.g., Fama 1970) and whether the operating lease footnote disclosure imposed significant information processing costs on equity investors (e.g., Blankespoor, deHaan, and Marinovic 2020).

We examine how the equity market reacts to firms' initial recognition of their operating leases after the implementation of ASC 842.[2] The initial recognition of operating leases should not represent new information to investors who had been efficiently processing the operating lease footnote disclosure prior to ASC 842.[3] If equity investors efficiently processed this disclosure, then

[1] The idea of considering off-balance sheet leases in security analysis goes back to at least Graham and Dodd (1934). Contemporary textbooks that provide examples of adjustments for off-balance sheet leases include: Koller, Goedhart, and Wessels (2010), Damodaran (2012), Palepu and Healy (2013), Holthausen and Zmijewksi (2014), Wahlen, Baginski, and Bradshaw (2015), and Easton, McAnally, Sommers, and Zhang (2018). Some contemporary textbooks mention the off-balance sheet treatment of operating leases but do not provide examples of adjustments for off-balance sheet leases (e.g., Penman 2010; Lundholm and Sloan 2019).

[2] We examine the reaction in the equity market rather than the debt market because credit rating agencies adjust for operating leases (Kraft 2015) and because the corporate bond market might be more efficient than the equity market (Chordia, Goyal, Nozawa, Subrahmanyam, and Tong 2017).

[3] The fiscal year 2018 10-K not only contains the operating lease footnote disclosure but also discloses management's estimate of the impact of ASC 842 on future financial statements (i.e., management discloses its

we should not find a significant equity market reaction when firms first begin recognizing their operating leases (i.e., around their first quarter 2019 earnings announcements). This follows from the fact that although the accounting change affects the amounts firms show on their balance sheets, it does not affect firms' risk or future cash flows. However, if equity investors had been inefficiently processing this disclosure, then we should find a negative equity market reaction when firms first recognize significant operating leases under ASC 842. In this inefficient processing case, the accounting change gets incorrectly interpreted as new information that makes high operating lease firms appear riskier due to the worsening of their financial ratios (e.g., large increases in their reported leverage).

In general, prior research suggests that equity prices reflect sophisticated financial statement analysis. Equity investors seem to understand the valuation implications of differences in accounting methods, changes in accounting methods, and disclosed but unrecognized accounting information.[4] With respect to unrecognized leases, Imhoff, Lipe, and Wright (1993) and Ely (1995) find that equity investors seem to capitalize unrecognized leases in assessing a firm's risk. Bratten, Choudhary, and Schipper (2013) conclude that equity investors process unrecognized leases (i.e., operating leases) and recognized leases (i.e., capital leases) similarly due to their similar associations with proxies for the cost of equity. Overall, prior research suggests that equity investors adjust for operating leases and thus firms' recognition of their operating leases should not affect equity prices. However, the change in the lease accounting standard gives us the opportunity to examine this issue with a more direct research design that better allows for causal inference.

estimate of the amounts to be recognized on its 2019Q1 balance sheet). We find no evidence of a relation between operating lease intensity and abnormal stock returns around the 2018 10-K filing date (untabulated).

[4] See Kothari (2001) for a review, relevant studies include: Ball (1972), Kaplan and Roll (1972), Beaver and Dukes (1973), Sunder (1975), Dhaliwal (1986), Dhaliwal, Guenther, and Trombley (1999) and Jin, Merton, and Bodie (2006).

While textbooks explain adjusting for operating leases, we explore the possibility that the marginal equity investor did not adequately adjust for operating leases before ASC 842. We view information processing costs (e.g., Ball 1992; Blankespoor, deHaan, and Marinovic 2020) as potentially large enough to have prevented equity prices from fully reflecting the information in operating lease footnote disclosures. The preference for off-balance sheet leases (e.g., Imhoff and Thomas 1988) suggests that managers view the information processing costs related to operating leases as significant. Consistent with higher information processing costs, neither the information needed to make an adjustment nor an adjustment itself were widespread (i.e., data providers did not provide a "canned" adjustment, likely requiring users to obtain the firm's 10-K and adjust themselves). In an American Accounting Association Presidential Scholar address, Sloan (2019) suggests that quantitative investors use financial ratios in their trading strategies but do not always conduct careful fundamental analysis like adjusting for operating leases. Anecdotal evidence also suggests that equity investors may not have been properly adjusting for operating leases. The CEO of AMC Entertainment Holdings Inc. linked a decline in his firm's stock price to ASC 842 and Li (2019a) expressed the concern that ASC 842 would lead to firms with significant operating leases being screened out by quantitative funds and indexes that use debt-to-equity ratios to rank companies, such as the MSCI Quality index.[5]

We find that firms with significant unrecognized leases (based on their operating lease footnote disclosure for fiscal year 2018), on average, have lower stock returns during the 3- and 11-day windows around their first quarter 2019 earnings announcements (i.e., at the time that the previously disclosed leases first become recognized). For example, firms above the 95th percentile of operating lease intensity experience a mean abnormal return of -5.50% (t-statistic = -4.08) during the 11-day

[5] The AMC earnings conference call was held on August 8, 2019. A complete transcript of the call is available at: https://www.fool.com/earnings/call-transcripts/2019/08/08/amc-entertainment-holdings-inc-amc-q2-2019-earning.aspx.

window around their first quarter 2019 earnings announcements.[6] This represents the worst performance around first quarter earnings announcements in our 24 year sample period for firms in the top 5% of the operating lease intensity distribution. Comparing the mean abnormal return in 2019 to the mean abnormal return in each of the previous 23 years, we find that the mean abnormal return in 2019 was worse at the 5% (10%) significance level in 22 (23) of the 23 years. Using a difference-in-difference research design that controls for risk, we continue to find that the negative relation between operating leases and abnormal earnings announcement returns for the first quarter of 2019 is unusual compared to this relation in first quarter earnings announcements of prior years. The relation is most negative in 2019 and significantly more negative in 2019 at the 1% significance level than all but two of the previous 23 years (1999 and 2000).

Like Michels (2017), our setting and research design allows for the drawing of causal inference in the area of disclosure versus recognition.[7] We view the possibility of a concurrent shock (e.g., Leuz and Wysocki 2016) as the main threat to our ability to draw a causal inference. A concurrent shock concerns us because of the near simultaneous reporting of first quarter 2019 earnings announcements and the concentration of high operating lease intensity within the retail industry. While our main result is robust to the inclusion of industry fixed effects and holds for both the retailers and non-retailers subsamples, the economic significance for retailers is about five times greater than that for non-retailers. On the one hand, this makes sense as retailers exhibit much more variation in the use of operating leases compared to other industries, but on the other hand it raises

[6] The magnitude of this market reaction seems plausible considering the significant deterioration in the financial ratios for these firms in the first quarter of 2019 due to adopting ASC 842. For example, the median debt-to-equity ratio for this group of firms increases from 0.34 to 1.51, consistent with Imhoff, Lipe, and Wright (1991) and Sloan (2019).

[7] Distinguishing between how investors process disclosed versus recognized accounting information has been a challenging area for researchers (e.g., Bernard and Schipper 1994; Michels 2017). Michels (2017) exploits plausibly exogenous variation in accounting due to natural disasters and finds a greater market reaction to recognized versus disclosed information.

the concern that some other concurrent industry shock correlated with the use of operating leases explains much of our findings.

We view the increase in trade tensions between the United States and China as the most plausible concurrent shock as trade tensions frequently made headlines in 2019. Inconsistent with retailers' reliance on Chinese imports representing a correlated omitted variable, we do not find a positive relation between operating lease intensity and a dependence on Chinese imports for merchandise. Furthermore, we find that a hedge portfolio based on operating lease intensity (long the top 10% of firms based on operating lease intensity and short firms with zero operating leases) generates significantly negative Fama and French (2015) five-factor alphas during the April through June 2019 period (i.e., when firms first recognize their operating leases) even after controlling for the returns on additional portfolios meant to proxy for risk related to trade tensions with China (i.e., a portfolio of U.S. firms with significant revenues from China and a portfolio of retailers with significant imports from China). In other words, the negative abnormal earnings announcement returns to high operating lease firms do not seem to be driven by concurrent trade tensions between the United States and China. While this does not rule out the possibility that some other concurrent shock or chance explains the negative abnormal returns to high operating lease firms around their first quarter 2019 earnings announcements, our results are consistent with the theory that disclosure processing costs reduce price informativeness (e.g., Grossman and Stiglitz 1980; Verrecchia 1982) and that a recognition regime increases price informativeness relative to a disclosure regime (Barth, Clinch, and Shibano 2003).

To address the concern that our analyses rely on our estimates of what firms recognize on their balance sheets due to ASC 842, we repeat our analysis on the retailers subsample after hand-collecting the operating lease amounts actually recognized by these firms (i.e., the right-of-use operating lease asset from retailers' 10-Qs for their first quarter of 2019). We find similar results using what retailers actually recognized compared to our estimates based on the 2018 operating lease

footnote disclosure.[8] We also examine the possibility that the change in lease accounting standard creates confusion leading to a negative market reaction that later gets corrected. We do not find any evidence of a reversal in the four weeks subsequent to the 11-day earnings announcement window and the operating lease hedge portfolio does not recover from its decline during the April – June 2019 period by the end of 2019.

We contribute to the literatures on market efficiency and disclosure versus recognition by showing that the higher information processing costs inherent in disclosed versus recognized accounting information can lead to equity mispricing, even in the case of a common and well-known accounting distortion. Michels (2017) finds that investors may not adequately use footnote disclosures for infrequent transactions such as subsequent events. We extend this finding to footnote disclosures related to a common transaction (i.e., operating leases).[9] Consistent with Blankespoor, deHaan, and Marinovic (2020), our findings suggest that disclosure processing costs are an important consideration in the study of equity markets. Our results suggest that, even for equity investors, the disclosure processing costs related to operating leases were surprisingly high. By eliminating these disclosure processing costs, ASC 842 provides a significant benefit to financial statement users. Our results support Sloan (2019) which argues that the change in lease accounting: "is a good example of how improved accounting rules can better reflect economic reality and so protect investors who rely on simple accounting ratios."

2. Background and Hypothesis Development

[8] In our hand-collected sample, the amounts actually recognized and our estimates have a Pearson (Spearman) correlation of 0.94 (0.95).

[9] Other studies that find valuation differences between disclosed and recognized items (e.g., Davis-Friday, Folani, Liu, and Mittelstaedt 1999; Ahmed, Kilic, and Lobo 2006; Yu 2013; Müller, Riedl, and Sellhorn 2015) apply to arguably more complex and/or less well-known issues in financial accounting (e.g., pensions and derivatives).

ASC 842 requires public firms to recognize operating lease assets and operating lease liabilities "for fiscal years beginning after December 15, 2018, and interim periods within those fiscal years." Thus, these operating lease assets and liabilities first appear on balance sheets for the first quarter of fiscal year 2019.[10] Prior to ASC 842 (i.e., under SFAS 13), information on operating leases was only disclosed in the footnotes of the 10-K. In this footnote, firms provided their operating lease commitments for each of the next five years and the total of all operating lease commitments beyond the fifth year. Investors could use this disclosure along with some assumptions to capitalize the present value of the firm's operating lease commitments.[11] Financial statement analysis and equity valuation textbooks such as Koller, Goedhart, and Wessels (2010), Damodaran (2012), Palepu and Healy (2013), Holthausen and Zmijewksi (2014), Wahlen, Baginski, and Bradshaw (2015), and Easton, McAnally, Sommers, and Zhang (2018) all provide examples of adjusting a firm's financial statements for operating leases. The new lease standard, ASC 842, eliminates the need for investors to adjust for operating leases.

Adjusting the financial statements was necessary to correct for accounting distortions arising from the off-balance sheet treatment of operating leases under SFAS 13. For firms with significant operating leases, adjusting their balance sheets makes their financial ratios more comparable to other firms.[12] Without adjusting, the lower reported assets and liabilities of firms with significant operating leases results in them appearing to have healthier financial ratios (e.g., Imhoff, Lipe, and Wright 1991; Sloan 2019). The unadjusted financial statements of firms with significant operating

[10] We view the possibility of early adoption and/or late adoption as very unlikely to affect our findings. In the process of hand-collecting the samples that we use in tables 3 and 10, we found only one early adopter and four late adopters (e.g., emerging growth companies can delay the adoption of new accounting standards until those standards apply to private companies) out of 240. We exclude these five observations from our samples.
[11] Investors must assume the appropriate discount rate to use and depending on their capitalization approach may need to assume the specific timing of all operating lease payments occurring beyond the fifth year.
[12] We view a related adjustment to the income statement as relatively unimportant in comparison to the balance sheet adjustment. For the 132 firms with a first-digit SIC code of 5 in our sample, we examined their 2018 10-Ks and found that none of them disclosed that ASC 842 would materially impact their future income or cash flows.

leases can show lower risk due to a lower debt-to-equity ratio, higher profitability from a higher return on assets, better liquidity because of a higher current ratio, and better asset productivity through a higher asset turnover. Imhoff, Lipe, and Wright (1991) show that the average return on assets falls by 34% and the average debt-to-equity ratio increases by 191% after capitalizing the operating leases for a small sample of firms with high operating leases. Thus, adjusting for operating leases has a large impact on the financial ratios of firms with significant operating leases.

A failure to adjust for the use of operating leases could have led equity investors to overvalue firms with significant operating leases. To the extent that investors conducted their valuations on a relative basis without any adjustment for operating leases (i.e., "taking accounting numbers at face value"), firms with high operating leases would have appeared more attractive and valuable (Sloan 2019). These firms also would have appeared more valuable to quantitative investors that used unadjusted financial ratios in their models and to investors that screened companies based on unadjusted financial ratios (Sloan 2019). The positive relation between the cost of equity and leverage (e.g., Modigliani and Miller 1958; Hamada 1972) suggests that high operating lease firms appeared safer due to their lower unadjusted leverage ratios. By appearing safer, the overvaluation of high operating lease firms could have resulted from investors incorrectly using cost of equity estimates that were too low.

In an efficient market, investors adjust the financial statements for relevant footnote disclosures. Thus, prior to ASC 842, investors should have used the operating lease footnote disclosure to adjust the financial statements. The resulting financial ratios would not suffer from comparability issues and would not mislead investors regarding firm risk. The newly recognized operating lease assets and liabilities under ASC 842 should not surprise investors as they should approximate the amounts that investors had been calculating using the operating lease footnote disclosure. The newly recognized amounts on 2019Q1 balance sheets should also not surprise investors because firms typically disclosed in their fiscal year 2018 10-K the estimated impact of ASC 842 on their upcoming

financial statements.[13] Therefore, under an efficient market the new accounting standard should not affect equity valuations. We state our hypothesis in null form as follows:

H_0: The recognition of operating leases did not affect equity valuations.

Kothari (2001) reviews early research on the relation between accounting method differences and equity valuation. Consistent with the efficient markets hypothesis (Fama 1970), many studies suggest sophisticated financial statement analysis on the part of investors with respect to differences in depreciation methods (Beaver and Dukes 1973), differences in inventory methods (Dhaliwal, Guenter, and Trombley 1999), the expensing of research and development costs (Dukes 1976), off-balance sheet pension liabilities (Dhaliwal 1986), and off-balance sheet operating leases (Imhoff, Lipe, and Wright 1993; Ely 1995). Gonedes and Dopuch (1974), Lev and Ohlson (1982), and Kothari (2001) review studies on accounting method changes and market efficiency. These studies frequently examine the impact on securities prices from changes in depreciation and inventory methods.[14] Kothari (2001) concludes that: "the announcement effects of accounting method changes are generally small." Overall, the prior literature on market efficiency with respect to accounting methods and method changes suggests that we should not find a reaction to high operating lease firms recognizing their operating leases on their balance sheets.

Lipe (2001) reviews the early literature on operating leases and Spencer and Webb (2015) review the more recent literature on operating leases. Lipe (2001) concludes: "the main finding from past research is that academics and analysts are well aware that leases provide lessees with off-balance-sheet financing." Consistent with this conclusion, studies such as Imhoff, Lipe, and Wright (1993),

[13] For the 132 firms with a first-digit SIC code of 5 in our sample, we hand-collected their 2018 10-Ks and their 2019Q1 10-Qs. 115 of the 132 (87%) firms disclosed a point or range estimate for the right-of-use asset and/or the operating lease liability that they were going to recognize on their 2019Q1 balance sheet. The disclosed estimates in 2018 10-Ks and the amounts actually recognized in 2019Q1 10Qs (both scaled by total assets) have a Pearson (Spearman) correlation of 0.97 (0.99).

[14] Studies on accounting method changes and market efficiency include Ball (1972), Kaplan and Roll (1972), Archibald (1972), Sunder (1973, 1975), Brown (1980), Comiskey (1971), Harrison (1977), and Ricks (1982).

Ely (1995), and Caskey and Ozel (2019) find an association between risk and off-balance sheet leases. Also, consistent with an association between risk and off-balance sheet leases, Altman, Halderman, and Narayanan (1977) find that capitalizing operating leases improves the predictions from their bankruptcy prediction model. In the debt market, Altamuro, Johnston, Pandit, and Zhang (2014) and Kraft (2015) find that adjustments for operating leases better explain loan spreads. While in the equity market, Dhaliwal, Lee, and Neamtiu (2011) and Bratten, Choudhary, and Schipper (2013) find positive associations between operating leases and proxies for the cost of equity.

Potentially consistent with investors inefficiently processing operating lease footnote disclosures, Dhaliwal, Lee, and Neamtiu (2011) find that operating leases (compared to capital leases) have a weaker association with proxies for the cost of equity. However, Bratten, Choudhary, and Schipper (2013) question the results in Dhaliwal, Lee, and Neamtiu (2011) and conclude that disclosed items (i.e., operating leases) are not processed differently from recognized items (i.e., capital leases) because they find operating leases and capital leases to have similar associations with cost of equity proxies. Yet, Bratten, Choudhary, and Schipper (2013) also conclude that investors place less weight on operating leases (compared to capital leases) when the operating lease disclosure is "less reliable."[15] In contrast to these two relative association studies, the change in lease accounting standard allows for a more direct assessment of whether equity investors under-weighted operating lease footnote disclosures in their equity valuations. The exogenous change in the lease accounting standard allows us to use a short-window event study approach and a difference-in-difference approach to assess whether the recognition of operating leases led to a decline in equity valuations.

For the change in the lease accounting standard to affect equity valuations, investors must not have been properly adjusting for operating leases prior to ASC 842. The overvaluation for high

[15] Bratten, Choudhary, and Schipper (2013) argue that firms with a high operating lease payment beyond the fifth year (as a proportion of total operating lease payments) have a less reliable operating lease disclosure because of greater uncertainty in computing the present value of the total of all operating lease payments occurring beyond the fifth year.

operating lease firms would then get corrected around the time of the accounting change as the apparent worsening of these firms' financial ratios comes as a surprise to investors. We view information processing costs (e.g., Ball 1992; Blankespoor, deHaan, and Marinovic 2020) as potentially high enough to prevent equity prices from fully reflecting the use of operating leases. Investors would have needed to incur non-trivial awareness, acquisition, and integration costs (e.g., Blankespoor, deHaan, Wertz, and Zhu 2019) to adjust for operating leases prior to ASC 842.

Awareness and acquisition costs play a role because neither the information needed to make the adjustment nor the adjustment itself (e.g., a "canned" adjustment) are widespread. Many financial statement users, particularly individual investors, would have needed to obtain the firm's 10-K to find the operating lease footnote disclosure. Inconsistent with this occurring frequently, Loughran and McDonald (2017) document that, around its filing, the average (median) 10-K is only downloaded 28.4 (9) times from the U.S. Security and Exchange Commission's servers.[16] Also consistent with investors' arguably questionable information gathering practices, the most common firm specific web page visited on Yahoo Finance after the firm's summary home page is the firm's message board rather than the firm's financial statements or financial ratios (Lawrence, Ryans, and Sun 2017).[17] Even if investors seek financial statements or financial ratios, Yahoo Finance does not provide users with firms' operating lease disclosures and does not make any adjustments to the financial statements or financial ratios for operating leases. Overall, the awareness and acquisition costs prior to ASC 842 were potentially significant.

Integration costs play a role because even when an intermediary collects the relevant operating lease information for investors, the investor must still take the time and effort to make an adjustment themselves. Compustat, an example of a data provider that collects the information in the operating

[16] Loughran and McDonald (2017) examine the number of downloads by "non-robots" on the date of the 10-K filing and on the following day.
[17] Yahoo Finance is the most popular financial website according to Lawrence, Ryans, and Sun (2017).

lease footnote disclosure, does not make any adjustment and leaves the adjustment to the user. Value Line, an independent investment research firm, provides a one-year rental amount for uncapitalized leases, but does not make any adjustment for operating leases.

Consistent with managers recognizing that information processing costs are non-trivial, the case study by Palepu (1987) indicates that managers may be skeptical of the ability of financial statement users to adjust for accounting distortions. The prevalence and managerial preference for unrecognized (operating) leases over recognized (capital) leases suggests that this general skepticism may apply specifically to operating leases.[18] Imhoff and Thomas (1988) show that firms shifted to unrecognized, operating leases after SFAS 13 required the capitalization of capital leases. Moreover, Cornaggia, Franzen, and Simin (2013) document a significant increase in operating leases and a concurrent decrease in capital leases over time. Dechow, Ge, Larson, and Sloan (2011) suggest the use of operating leases indicates management's focus on financial statement window-dressing (i.e., improving the appearance of their financial statements). These findings are consistent with managers believing (perhaps correctly) that unrecognized leases lower their firm's cost of capital and thus increase the value of their firm.[19]

Anecdotal evidence also suggests that ASC 842 may affect equity valuations. The CEO of AMC Entertainment Holdings Inc. addressed ASC 842 during their second quarter 2019 earnings conference call. During the call, he linked the decline in his firm's stock price since their first quarter 2019 earnings announcement (on May 8, 2019) to ASC 842 and blames the financial data providers, specifically Bloomberg, Capital IQ, and FactSet, for classifying the newly recognized

[18] We recognize that influencing debt contracts and executive compensation (e.g., Watts and Zimmerman 1986) and tax laws or firm characteristics like risk and volatility (Caskey and Ozel 2019) represent other explanations for the use of operating leases.

[19] Comiran (2014) concludes that firms which lobbied against the new lease accounting standard did so due to the potential costs of implementation and not due to potential effects on the cost of capital. However, we view cost of capital arguments as unlikely to appear in comment letters because this argument essentially requires the manager to concede that their firm is overvalued (i.e., that their firm is benefitting from a cost of capital that is too low due to the off-balance sheet treatment of operating leases under SFAS 13).

leases as debt.[20] He argued that his firm now seems less attractive (due to the increase in leverage) to the algorithmic traders and traditional human asset managers that rely on these data providers. Li (2019a) also expressed the concern that ASC 842 would lead to firms with significant operating leases being screened out by quantitative funds, such as the MSCI Quality index, that use debt-to-equity ratios to rank companies.

3. Data

3.1 Measuring Operating Lease Intensity

Under SFAS 13, firms must disclose their future operating lease payments in the footnotes to their annual financial statements.[21] We obtain data on firms' 10-K operating lease footnote disclosures from the Compustat annual file. We follow Copeland, Koller, and Murrin (2000) and capitalize the first year's operating lease payment (*MRC1*) as a perpetuity. Our measure of a firm's operating lease intensity, *OpLeases*, equals the firm's first future annual operating lease payment (*MRC1*) capitalized as a perpetuity using the 10-year high quality market corporate bond par yield at the beginning of the calendar year as the discount rate.[22] We scale the value of this perpetuity by the firm's total assets to capture a firm's operating lease intensity. We view this approach as an easily replicable indicator of the extent to which a firm relies on operating leases in their operations.

The more common approach of discounting each of the five operating lease payments (i.e., *MRC1*, *MRC2*, *MRC3*, *MRC4*, and *MRC5*) and the thereafter payment (i.e., *MRCTA*) understates the

[20] The Compustat quarterly file includes the current operating lease liability in short-term debt (*DLCQ*) and the long-term operating lease liability in long-term debt (*DLTTQ*). Li (2019a) indicates that Bloomberg Terminal and FactSet classifies the operating lease liabilities as debt, but that Refinitiv classifies them as non-debt liabilities.
[21] Although firms now recognize operating leases on their balance sheets under ASC 842, firms continue to disclose their future operating lease payments for each of the next five years and thereafter as they did under SFAS 13.
[22] We obtain the 10-year high quality market corporate bond par yield (*HQMCB10YRP*) from the FRED website of the Federal Reserve Bank of St. Louis, available at: https://fred.stlouisfed.org/series/HQMCB10YRP.

use of operating leases for firms that are later in the life of their leases and will renew their leases.[23] Another advantage of our approach is that it does not depend on *MRCTA*. Bratten, Choudhary, and Schipper (2013) assert that *MRCTA* is less reliable and Altamuro, Johnston, Pandit, and Zhang (2014) indicate that *MRCTA* is often missing in Compustat prior to the year 2000. In order to avoid these issues with likely lease renewals and *MRCTA*, we treat *MRC1* as a perpetuity.

A disadvantage of the perpetuity approach is that it overstates the magnitude of operating leases because it assumes the assets being leased have an infinite life. Rather than the perpetuity approach from Copeland, Koller, and Murrin (2000), Koller, Goedhart, and Wessels (2010) recommend capitalizing operating leases using a declining perpetuity approach where the rate of decline is the straight-line depreciation rate of the leased asset (i.e., $\frac{1}{Asset\ Life}$). While this approach will yield lower and more realistic estimates, it requires an estimate of asset lives and in the end only differs from the perpetuity approach by a constant (assuming the same asset life assumption is applied to all firms) and therefore would not impact any of our analyses.

An alternative rule of thumb is to multiply rent expense (or next year's operating lease commitment) by eight (e.g., Koller, Goedhart, and Wessels 2010; Li 2019a; Caskey and Ozel 2019). Our approach capitalizes the first year's operating lease payment for 2019 using a multiplier (or capitalization rate) of about 25 (i.e., $\frac{1}{0.0406} \approx 25$).[24] Our discount rate for 2019 of 4.06% and an asset life of 11.75 years represents one set of assumptions that results in a multiplier of 8 (i.e., $\frac{1}{0.0406+\frac{1}{11.75}} \approx 8$). While our approach for calculating *OpLeases* for 2019 is approximated by $\frac{MRC1 \times 25}{AT}$, an alternative multiplier, such as $\frac{MRC1 \times 8}{AT}$, only differs by a constant. Thus, our results are robust to using any alternative multiplier. While the exact multiplier matters in terms of estimating a specific

[23] Consistent with firms renewing their operating leases, in untabulated analyses, we find that $MRC1_t$ rather than $MRC5_t$ has a stronger correlation with $MRC1_{t+4}$ (which is the amount that $MRC5_t$ should be predicting). In other words, current levels are better predictors (than current expectations of future levels) of future levels.
[24] The 10-year high quality market corporate bond par yield (*HQMCB10YRP*) on January 1, 2019 was 4.06%.

capitalization amount for a particular firm-year, it does not matter for the purposes of our analyses because the scaling of a variable does not affect the conclusions drawn from ordinary least squares regressions (assuming the application of the same multiplier to all firms from the same year).[25]

We use *OpLeases* in most of our analyses because we want to use a measure that could have been computed (i.e., available to investors) before the earnings announcements (i.e., before recognition of the operating leases) and because the Compustat quarterly file does not provide the right-of-use operating lease asset or the operating lease liability that firms recognized on their 2019Q1 balance sheets. Rather than providing these newly recognized amounts, Compustat includes them within property, plant, and equipment (*PPENTQ*), short-term debt (*DLCQ*), and long-term debt (*DLTTQ*). We hand-collect the operating lease amounts actually recognized on 2019Q1 balance sheets for high operating lease firms (firms in the top 10% of the *OpLeases* distribution) and for firms with a first-digit SIC code of 5. For the high operating lease firms, we use the hand-collected amounts to document the significant impact of operating lease recognition on the balance sheets and financial ratios of these firms (section 3.4). For the firms with a first-digit SIC code of 5, we use the hand-collected amounts to perform analyses (section 4.6) using an alternative measure of operating lease intensity, *ROU_Asset*, which is the hand-collected right-of-use operating lease asset that firms first recognize on their 2019Q1 balance sheets, scaled by total assets. Consistent with *OpLeases* being a measure that varies with what firms actually recognize, the Pearson (Spearman) correlation between *ROU_Asset* and *OpLeases* is 0.94 (0.95).

3.2 Control Variables and Sample

Appendix 1 provides detailed variable descriptions. We obtain first quarter earnings announcement dates (*RDQ*) from the Compustat quarterly file and daily stock returns from CRSP.

[25] Allowing the multiplier to vary across firms within a given year, would require ad hoc assumptions about each firm's cost of debt for the incremental borrowing needed for the leased assets and about the length of each firm's leases while taking likely renewals into consideration.

We compute buy and hold abnormal returns by compounding the firm's daily returns and subtracting the compounded return for the CRSP value-weighted index over the same trading days. We examine abnormal return windows of 3- and 11-trading days with the variables, $Ret_{[-1, +1]}$ and $Ret_{[-5,+5]}$, respectively. A shorter window, such as three days, provides a more direct link with the firm's recognition of its operating leases. A longer window, such as eleven days, allows for both a delayed reaction and an anticipation of the recognition, but also increases the concern that other events occurring during the window, and not the recognition of operating leases, explains any abnormal returns.[26] A delayed reaction could occur if investors are slow to react to the worsening in financial ratios or if the balance sheet is not included in the earnings announcement press release but only provided later in the firm's 10-Q filing.[27] An anticipation of the recognition in the few days before a firm's earnings announcement could occur due to information transfer from other high operating lease firms in the same industry.[28]

We collect analyst-based earnings surprises from IBES to control for the contemporaneous first quarter earnings news. We use the Compustat annual file to measure firm size, market-to-book ratio, asset growth, profitability, debt-to-equity ratio, and earnings volatility which we use as controls for risk (e.g., Fama and French 1992; Cooper, Gulen, and Schill 2008; Novy-Marx 2013).[29] To reduce the effects of small firms, illiquid firms, and bid-ask bounce we require firms at their previous fiscal year end to have a market capitalization above the tenth percentile of NYSE firms and a stock price

[26] Johnson and So (2018) recommend a longer window to avoid microstructure issues with shorter windows.
[27] Although firms do not always provide balance sheets at their earnings announcements (Chen, DeFond, and Park 2002), the practice has increased over time. Beaver, McNichols, and Wang (2020) find that 71% of balance sheet items are disclosed in earnings announcements in 2016. In our 2019 sample of first quarter earnings announcements, our 11-trading day return window centered on the earnings announcement date also contains the 10-Q filing date 78% of the time.
[28] The information transfer literature documents that firms' stock prices react to the earnings announcements of peer firms in the same industry (e.g., Foster 1981; Han and Wild 1990; Freeman and Tse 1992; Ramnath 2002; Thomas and Zhang 2008).
[29] Following Fama and French (1992) we exclude firms with negative book equity due to the difficulty in interpreting negative market-to-book ratios (and negative debt-to-equity ratios).

greater than $5 per share (e.g., Jegadeesh and Titman 2001; Zhang 2006).[30] We require firms to have fiscal year ends of December, January, or February because these are the first firms to report under the new lease accounting standard.[31] Our sample consists of 1,779 first quarter 2019 earnings announcements and 32,995 first quarter earnings announcements from years before operating leases became recognized on balance sheets (1996 – 2018). We begin our comparison sample in 1996 to ensure that investors can access operating lease footnote disclosures in 10-Ks through the SEC EDGAR website.

3.3 Descriptive Statistics

Table 1 presents descriptive statistics for our sample of first quarter earnings announcements. We present the descriptive statistics for first quarter 2019 earnings announcements in panel A. In panel B, we present the descriptive statistics for first quarter earnings announcements from 1996 through 2018. Our measure of operating lease intensity, *OpLeases*, has a lower mean in 2019 (0.28) compared to the mean from 1996 - 2018 (0.32). While a decline in the use of operating leases in the last 10-K before recognition potentially merits future research, it should not affect our study because it represents old news (i.e., we measure *OpLeases* from 10-K disclosures but examine returns at the following earnings announcement).[32]

For the 1996 – 2018 period, consistent with an earnings announcement premium, the means for the abnormal returns centered on firms' earnings announcement dates, $Ret_{[-1, +1]}$ and $Ret_{[-5, +5]}$ are 0.39% and 0.52%, respectively.[33] For 2019, the mean market reaction around earnings

[30] We use the NYSE market capitalization breakpoints from Kenneth French's data library: https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.
[31] Thus, these firms will have first quarters that end in March, April, or May and will typically announce their first quarter earnings in the months of April, May, or June.
[32] Potential explanations for a decrease in the future operating lease payments disclosed in fiscal year 2018 10-Ks include: a decrease in investment in operating leases for economic reasons, a shift away from operating leases due to the imminent removal of the favorable accounting treatment, and/or managers delaying operating lease renewals (or changing their assumptions about renewals) in 2018 to reduce the amount to be recognized in 2019.
[33] The earnings announcement premium literature finds that, on average, firms earn positive abnormal returns around their earnings announcements (e.g., Ball and Kothari 1991; Cohen, Dey, Lys, and Sunder 2007; Barber, De George, Lehavy, and Trueman 2013; Savor and Wilson 2016).

announcements was negative. The means for the abnormal returns in 2019 for the 3- and 11-day windows are -0.49% and -0.21%, respectively. Comparing the means between panels A and B for the other variables indicates that 2019 firms are larger, have higher market-to-book ratios, lower asset growth, lower profitability, and lower earnings volatility.

Table 2 presents the distribution of our main variable of interest, *OpLeases*, across industries. We use the first digit of firms' Standard Industrial Classification (SIC) codes to group firms into industries. Firms with a first-digit SIC code of 5 (retailers), on average, have the greatest operating lease intensity with a mean for *OpLeases* of 1.29. Firms with a first-digit SIC code of 6 (financials), on average, have the lowest operating lease intensity with a mean for *OpLeases* of 0.05. The extremely high level of *OpLeases* among retailers concerns us because it raises the possibility that a negative relation between *OpLeases* and abnormal stock returns could be due to a negative shock to the retail industry that just happens to coincide with the recognition of operating leases in April through June of 2019 (e.g., an escalation in trade tensions between the United States and China). To deal with this concern, in later analyses we report results using industry fixed effects, we also report separate results for retailers and non-retailers, and in our portfolio time series analysis we control for the returns to a portfolio of retailers that UBS identifies as having the greatest percentage of their merchandise imported from China.

3.4 Univariate Results

Table 3 documents the impact of operating lease recognition on the balance sheets and financial ratios for high operating lease firms. We define high operating lease firms as firms in either the top 1%, 5% or 10% of the *OpLeases* distribution for 2019. For these firms we hand-collect the operating lease amounts recognized on their balance sheets from their 2019Q1 10-Qs. Table 3 presents the mean and median increase in total assets and total liabilities for these firms. The median increase in total assets (total liabilities) for firms in the top 1%, 5%, and 10% of the operating lease distribution is 67% (252%), 46% (107%), and 19% (51%), respectively. The significant increases in total assets

and total liabilities lead to significant changes to these firms' financial ratios. Table 3 also presents the debt-to-equity ratio, return on assets, the current ratio, and asset turnover for these firms with and without the recognition of operating leases. The ratios without operating lease recognition represent much stronger performance and financial health than the ratios with the recognition of operating leases (Imhoff, Lipe, and Wright 1991). For example, for firms in the top 5% of the *OpLeases* distribution in 2019, the median debt-to-equity ratio rises from 0.34 to 1.51, the median return on assets falls from 5.40% to 4.35%, the median current ratio decreases from 1.73 to 1.34, and the median asset turnover drops from 1.74 to 1.15. Table 3 also shows the market reaction around these firms' 2019Q1 earnings announcements. We find that the magnitude of the market reactions across these three groups of firms parallel the extent to which their balance sheets and financial ratios were impacted by the recognition of operating leases. The mean 3-day (11-day) reaction for firms in the top 1%, 5%, and 10% of the operating lease distribution is -6.11% (-12.34%), -3.53% (-5.50%), and -2.10% (-3.10%), respectively.

Because high operating lease firms are potentially riskier and more volatile firms (Caskey and Ozel 2019), we provide context on how the market reaction in 2019 compares to prior years in Figure 1. In this figure, we plot the mean of $Ret_{[-5,+5]}$ and its 95% confidence interval by year. Specifically, each year we take the top 5% of the *OpLeases* distribution (based on the 10-K for the previous fiscal year) and compute the mean 11-day abnormal market reaction at the earnings announcement for the first fiscal quarter. The -5.50% mean abnormal return at the 2019Q1 earnings announcement represents the worst performance for firms in the top 5% of the *OpLeases* distribution around first quarter earnings announcements in our 24 year sample period. Comparing the mean abnormal return

in 2019 to the mean abnormal return in each of the previous 23 years, we find that the mean abnormal return in 2019 was worse at the 5% (10%) significance level in 22 (23) of the 23 years.[34]

Table 4 presents Spearman and Pearson correlations for the 2019 sample in panel A and for the 1996 – 2018 sample in panel B. We find a significantly negative relation between operating lease intensity and abnormal returns around first quarter earnings announcements in 2019, as shown in panel A. The Pearson (Spearman) correlations between *OpLeases* and $Ret_{[-1, +1]}$ and $Ret_{[-5, +5]}$ are -0.10 and -0.15 (-0.10 and -0.14), respectively. All four of these correlations are significant at the 1% level. In contrast, panel B shows little correlation between operating lease intensity and earnings announcement abnormal returns for the 1996-2018 period. The four correlations range from -0.01 to 0.01 and none are significantly negative. Like figure 1, the difference in correlations between panel A and panel B suggests that the negative correlation between operating lease intensity and abnormal earnings announcement returns might be unique to 2019. We examine this formally later with our difference-in-difference estimation in table 6.

4. Multivariate Results

4.1 Operating Lease Intensity and Abnormal Earnings Announcement Returns

Table 5 presents the results of our multivariate analysis of the relation between operating lease intensity and first quarter 2019 abnormal earnings announcement returns. We control for the earnings news and for firm characteristics (size, market-to-book, asset growth, and profitability) that prior research suggests are related to stock returns (e.g., Fama and French 1992; Cooper, Gulen, and Schill 2008; Novy-Marx 2013). We also control for leverage and earnings volatility (e.g., Dichev

[34] For brevity, we do not present figures for the top 1% or the top 10% of the *OpLeases* distribution, which are similar to figure 1. For the top 1% (10%), the mean of -12.34% (-3.10%) in 2019 is worse at the 5% significance level than 22 (21) of the previous 23 years.

and Tang 2009) because Caskey and Ozel (2019) find that high operating leases are riskier and more volatile. We estimate the following model for columns 1 and 2 of table 5:

$$Ret_{[-X,+X]} = \text{Intercept} + \beta_1 OpLeases + \beta_2 ESurp + \beta_3 Size + \beta_4 MB + \beta_5 Inv + \beta_6 Prof + \beta_7 Debt + \beta_8 EVol + \varepsilon \quad (1)$$

In columns 3 and 4, we estimate equation (1) after adding industry fixed effects based on firms' one-digit SIC code.[35] We examine a three-day return window, $Ret_{[-1, +1]}$, in columns 1 and 3 and an 11-day return window, $Ret_{[-5, +5]}$, in columns 2 and 4.

We find a significantly negative relation between operating lease intensity and abnormal 2019Q1 earnings announcement returns across all four columns of table 5. The coefficient on *OpLeases* is significant at the 1% level in columns 1, 2, and 4 and significant at the 5% level in column 3. The coefficients and t-statistics for the industry fixed effects columns (i.e., columns 3 and 4) are similar to the ones in the columns without industry fixed effects (i.e., columns 1 and 2). In terms of interpreting the economic significance of these results, given that the standard deviation for *OpLeases* is 0.52, a one (two) standard deviation change in *OpLeases* suggests an abnormal return of -0.73% (-1.46%) over a 3-day window and an abnormal return of -1.40% (-2.81%) over an 11-day window, holding all else constant. Unsurprisingly, the strongest relation with earnings announcement abnormal returns across all four columns belongs to the earnings surprise.

4.2 Difference-in-Difference Estimation

The previous table indicates that the firms with the greatest operating lease intensity, on average, experienced significant market value declines around the first recognition of their operating leases. We now examine the possibility that high operating lease intensity firms, on average, consistently experience lower stock returns around their first quarter earnings announcements. In other words, if high operating lease firms usually experience market declines around their first quarter earnings

[35] The analysis in table 5 is robust to the use of industry fixed effects based on the Fama-French 49 industry classifications for the 11-day window but not for the 3-day window.

announcements, then the fact that this tendency also occurs in 2019 would prevent us from attributing a decline in market values at that time to the recognition of operating leases. To test this possibility, we use a difference-in-difference research design and estimate the following model on all first quarter earnings announcements from 1996 – 2019:

$$Ret_{[-X,+X]} = Intercept + \beta_1 Y2019 + \beta_2 OpLeases + \beta_3 OpLeases \times Y2019 + \beta_4 ESurp + \beta_5 Size + \beta_6 MB + \beta_7 Inv + \beta_8 Prof + \beta_9 Debt + \beta_{10} EVol + \varepsilon \quad (2)$$

Y2019 equals one for first quarter 2019 earnings announcement and zero for first quarter earnings announcements from 1996 – 2018. *OpLeases* × *Y2019*, our main variable of interest, is the interaction between our continuous treatment variable, *OpLeases*, and our post-period indicator, *Y2019*.[36] In columns 3 and 4 of table 6, we present the results of model (2) after adding industry fixed effects based on one-digit SIC code.[37]

The interaction term, *OpLeases* × *Y2019*, is statistically significant at the 1% level in all four columns of table 6. The magnitudes of the coefficients on the interaction term are economically significant and consistent with the coefficients on *OpLeases* in table 5. We conclude that the negative relation between operating lease intensity and first quarter earnings announcement abnormal returns in 2019 is uncommon compared to the 1996 – 2018 period.[38] If there is not some other concurrent shock that could explain this, our finding is consistent with the recognition of operating leases causing a decline in the equity valuations of firms with significant operating leases, on average.

The analysis in table 6 compares whether the relation between operating lease intensity and Q1 earnings announcement abnormal returns in 2019 differs from their average relation in 1996 –

[36] Our difference-in-difference analysis is robust to using a binary treatment variable (e.g., an indicator variable equal to one for firms in the top 10% of the operating lease intensity distribution and equal to zero otherwise) instead of our continuous treatment variable, *OpLeases*.

[37] The analysis in table 6 is robust to the use of industry fixed effects based on the Fama-French 49 industry classifications.

[38] The results in tables 5 and 6 are robust to transforming the independent variables into decile ranks.

2018.[39] Figure 2 provides a visual representation of how the relation in 2019 differs from the relation in each of the 23 individual years from 1996 – 2018. Specifically, figure 2 plots the coefficient estimate for *OpLeases* and its 95% confidence interval from yearly estimations of equation (1) with $Ret_{[-5,+5]}$ as the dependent variable. The coefficient estimate of -0.027 for 2019 is the lowest of the 24 years and is statistically lower at the 5% significance level than 21 of the 23 previous years. Overall, figure 2 (multivariate analysis) is consistent with figure 1 (univariate analysis).

4.3 Retailers and Non-Retailers

Table 7 repeats the same analysis from subsection 4.1 on retail firms (defined as firms with a one-digit SIC code of 5) and non-retail firms (defined as firms that have a one-digit SIC code other than 5). We split the sample in this manner because table 2 showed that firms with a first-digit SIC code of 5 (retailers) tend to have significantly more operating leases. The results for the subsample of retailers appears in columns 1 and 2 and the results for the subsample of non-retailers appears in columns 3 and 4. For the retailers subsample, the coefficient on *OpLeases* is significant at the 5% level for the 3-day window and at the 1% level for the 11-day window. For the non-retailers subsample, the coefficient on *OpLeases* is significant at the 10% level for the 3-day window and at the 5% level for the 11-day window.

The economic significance differs considerably between the retailers and non-retailers. As shown in table 2, the standard deviation of *OpLeases* for retailers (1.15) is about 3.5 times that for non-retailers (0.32). Thus, for non-retailers the coefficient of -0.020 suggests an abnormal return of -0.64% and -1.28% over an 11-day window, for a one and two standard deviation change in *OpLeases*, respectively, holding all else constant. However, for retailers the coefficient of -0.030 suggests abnormal returns of -3.45% and -6.90% over an 11-day window, for a one and two standard deviation change in *OpLeases*, respectively, holding all else constant. Overall, the evidence in table

[39] Our difference-in-difference analysis is robust to using 2018 (or a set of recent years) as our pre-period instead of our 23 year period (1996-2018).

7 supports the existence of a negative relation between operating leases and abnormal returns for first quarter 2019 earnings announcements for both retailers and non-retailers. However, the economic significance for retailers seems to be about five times greater than that for the non-retailers.

4.4 Portfolio Time-Series Analysis

4.4.1 Risk Related to the Fama and French (2015) Five-Factors

In the previous analyses, we examined abnormal stock returns within 3- and 11-day windows around first quarter earnings announcements. In this subsection, we examine the daily returns to an operating lease hedge portfolio during 2019. The operating lease hedge portfolio is a zero-investment portfolio that is long the firms in the top 10% of the *OpLeases* distribution for 2019 and short the firms with a 2019 *OpLeases* value of zero (i.e., firms that do not have operating leases).[40] Figure 3 depicts the cumulative return to the hedge portfolio from April 1, 2019 through December 31, 2019. The figure also depicts the timing of the 2019Q1 earnings announcements for the firms in the top 10% of the *OpLeases* distribution. The figure shows that the hedge portfolio experienced a significant decline around the time that firms first recognized their operating leases (i.e., the second quarter of 2019 and more specifically the month of May 2019). The hedge portfolio exhibits volatility beyond the second quarter of 2019 but never gets above -4.50% and finished 2019 at -6.20%. This suggests that the initial decline around operating lease recognition largely represents a sustained decline in equity valuations for firms with high operating leases.

We next examine whether the returns to the operating lease hedge portfolio can be explained by exposure to risks related to the Fama and French (2015) five-factors. We estimate the following model using daily returns:

$$R_P = Intercept + \beta_1(R_M - R_F) + \beta_2 SMB + \beta_3 HML + \beta_4 RMW + \beta_5 CMA + \varepsilon \qquad (3)$$

[40] The zero-investment hedge portfolio consists of equal-weighted long positions in the 177 firms in the top 10% of the *OpLeases* distribution and equal-weighted short positions in the 319 firms with zero operating leases. We find similar results when using only the return on the long-side of the portfolio instead of the return on the hedge portfolio.

Table 8 presents the results. R_P is the daily return on the operating lease hedge portfolio (R_P). R_M-R_F is the daily return on the value-weighted market portfolio in excess of the daily risk-free rate. *SMB*, *HML*, *RMW*, and *CMA* are the daily returns to diversified portfolios based on the firm characteristics of market capitalization, market-to-book ratio, profitability, and asset growth.[41]

The intercept (or alpha) from these time-series regressions represents the average daily return to the operating lease hedge portfolio that cannot be explained by correlation with contemporaneous daily returns to the market, size, market-to-book, profitability, or investment factor portfolios. In columns 1 through 4, we estimate the model for each of the four calendar quarters in 2019. The -0.14% intercept for the second quarter of 2019 is statistically significant at the 1% level. The -0.14% daily alpha represents a cumulative alpha of -8.82% over the 63 trading days from April through June 2019 (i.e., -0.14% × 63 = -8.82%). The intercepts for the first, third, and fourth calendar quarters of 2019 are -0.03, -0.02, and -0.02, respectively. The alphas for the third and fourth calendar quarters indicate that there is not a continuation or reversal of the initial decline that occurred in the second calendar quarter of 2019 during the third and fourth calendar quarters of 2019. Overall, the negative returns to the operating lease hedge portfolio during the April through June 2019 period cannot be explained by exposure to the Fama and French (2015) five-factors.

We next examine whether the negative alpha earned by the operating lease hedge portfolio in April through June 2019 is unusual relative to April through June periods in prior years. In column 5, we repeat the previous analysis using all daily returns occurring in April through June of all years from 1996 through 2019. To test whether the intercept (alpha) differs in 2019 compared to the other years, we add an indicator variable, *Y2019*, to equation (3). The coefficient of -0.12 on *Y2019* is similar in magnitude to the intercept in column 2 and statistically significant at the 5% level. We

[41] The daily returns on the five-factor portfolios (R_M-R_F, *SMB*, *HML*, *RMW*, and *CMA*) are from Kenneth French's data library: https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

conclude that the negative intercept (or alpha) for the second calendar quarter of 2019 is unusual compared to the second calendar quarters from the 1996 – 2018 period.

4.4.2 Risk Related to Trade Tensions between the United States and China

The key period that we examine, April through June 2019, coincides with increased trade tensions between the United States and China. While we expect the market factor (R_M-R_F) to broadly capture risk related to the trade tensions over the period, it is possible that some firms or industries were disproportionately affected by these trade tensions. To examine this possibility, we add *CHINA* as an additional portfolio return to equation (3). *CHINA* is the daily excess return to the China Exposure Index by Fathom Consulting.[42] This index consists of 25 U.S.-listed firms with more than 15% of their revenues from China.[43] We view the returns on this index as proxying for risk related to trade tensions with China (i.e., days that this index rises (falls) likely correlates with tensions having eased (intensified)). Column 6 of table 8 presents the results with the *CHINA* portfolio added. The intercept in column 6 of -0.14 is not materially different from the intercept in column 2. The insignificant coefficient on *CHINA* indicates that the operating lease hedge portfolio does not load on this portfolio (i.e., the operating lease hedge portfolio does not have significant exposure to a China risk factor based on revenues from China).

The exposure to risk related to trade tensions with China is not limited to firms with revenues from China and may also apply firms that heavily import from China such as some retailers. To examine this possibility, we add *RETAIL* as an additional portfolio return to equation (3). *RETAIL* is the daily excess return on a portfolio of ten retail stocks identified by UBS as most sensitive to trade tensions with China due to the retailers' dependence on sourcing goods from China.[44] According to

[42] Excess return refers to the daily return on the portfolio in excess of the risk free rate.
[43] Daily prices for the China Exposure Index are available through Thomson Reuters' Datastream service.
[44] The list of 10 retailers and the percentage of their merchandise sourced from China is available at: https://www.cnbc.com/2019/05/06/here-are-the-companies-wall-street-is-worried-most-about-if-a-full-blown-trade-war-breaks-out.html.

Li (2019b), UBS identifies the ten retailers as having between 45% and 15% of their merchandise sourced from China. In untabulated results, for these 10 firms we regress our measure of operating lease intensity, *OpLeases*, on the percentage of their merchandise sourced from China. We find a negative coefficient on the percentage of merchandise sourced from China with a t-statistic of -1.84 and a p-value of 0.10. Thus, the analysis of this small sample suggests a negative relation between the use of operating leases and sourcing from China, rather than the positive relation that would be needed to explain our results as being due to exposure to China trade tensions related to the importing of goods from China.

Column 7 presents the results after adding *RETAIL* to equation (3). The intercept of -0.13 remains significantly negative at the 1% significance level. The coefficient on *RETAIL* is significant, indicating a significant correlation between the daily returns on *RETAIL* and our operating lease hedge portfolio. This is not surprising because both portfolios contain a significant number of retailers. *RETAIL* consists of 100% retailers, while the long side of the operating lease hedge portfolio consists of 42% retailers (untabulated).

4.5 Confusion Hypothesis

Confusion represents an alternative explanation for equity market value declines in high operating lease firms around the initial recognition of operating leases. Maurer (2019) reports that the investment bank Credit Suisse suggests that the lease accounting change could lead to confusion because data vendors handled the accounting change differently and investors may not know how their particular data vendor handled the change. This could lead to a potential double counting of the impact of operating leases. Under the confusion hypothesis, the initial reaction represents confusion that should subsequently reverse as the confusion gets corrected. We do not find much support for the confusion hypothesis. Recall that in subsection 4.4, we found no evidence of significantly positive alphas during the third or fourth quarters of 2019 (see columns 3 and 4 of table 8) and the

negative cumulative return on the operating lease hedge portfolio incurred during the second calendar quarter of 2019 largely remains at the end of 2019 (see figure 3).

We further address the confusion hypothesis in table 9. In table 9, we repeat our analysis from table 5 using abnormal return windows that begin after the 11-trading day window centered on the 2019Q1 earnings announcement. In column 1 of table 9, for easy comparison the dependent variable is $Ret_{[-5,+5]}$ which repeats the results initially shown in column 2 of table 5. In columns 2, 3, 4, and 5 the dependent variables are $Ret_{[+6,+16]}$, $Ret_{[+17,+27]}$, $Ret_{[+28,+38]}$, and $Ret_{[+39,+49]}$, respectively (i.e., the abnormal returns over the four 11- day windows after the 11-day window centered on the 2019Q1 earnings announcement). The negative relation between operating leases and abnormal returns is strongest during the [-5, +5] window, consistent with investors reacting to the recognition of operating leases. The significantly negative relation persists into the [+6, +16] and [+17, +27] windows, albeit with much smaller coefficients on *OpLeases* (-0.007 and -0.005 compared to -0.027 for the [-5, +5] window). This suggests that investors were slow to fully react to the recognition of operating leases. It also suggests that the [-1, +1] and [-5, +5] windows used throughout this study potentially understate the equity market reaction to the recognition of operating leases. We find evidence of a statistically significant reversal of the negative relation during the [+28, +38] window, but this small reversal is offset by the small continuation of the negative relation during the next window (i.e., [+39, +49]).

4.6 Recognized Operating Lease Amounts

In previous analyses (with the exception of table 3), we did not examine what firms actually recognized for their operating lease assets and operating lease liabilities in their first quarter 2019 balance sheets. In this subsection, we address the concern that our results could be driven by bias in our measure of operating lease intensity. We hand-collect the operating lease amounts actually recognized (i.e., the right-of-use operating lease asset from retailers' 10-Qs for their first quarter of 2019) for our sample of 132 firms with a first-digit SIC code of 5 (retailers).

In table 10, we repeat our analyses from columns 1 and 2 of table 7, but rather than using *OpLeases* as the independent variable of interest, we use *ROU_Asset* which is the (hand-collected) right-of-use operating lease asset recognized on the 2019Q1 balance sheet scaled by total assets. The t-statistics in table 10 decline a bit compared to table 7. Column 1 (2) is now only significant at the 10% (5%) level. However, the economic significance of the results remain about the same across the two tables given that the standard deviation of *ROU_Asset* for these firms is 0.15 (untabulated) while the standard deviation of *OpLeases* for these firms is 1.15 (see table 2). Thus, a one (two) standard deviation change in *OpLeases* suggests an abnormal return of -2.07% (-4.14%) over a 3-day window and an abnormal return of -3.45% (-6.90%) over an 11-day window, while a one (two) standard deviation change in *ROU_Asset* suggests an abnormal return of -2.25% (-4.50%) over a 3-day window and an abnormal return of -3.30% (-6.60%) over an 11-day window. Overall, we conclude that our results are not driven by potential bias in our estimate of operating lease intensity.

5. Conclusion

The off-balance sheet treatment of operating leases was a well-known accounting distortion that resulted in the appearance of healthier financial ratios for firms using operating leases. To correct this distortion, financial statement users needed to use the operating lease footnote disclosure to adjust the balance sheet for the present value of the firm's future operating lease commitments. The new lease accounting standard, ASC 842, eliminated the need for this adjustment by requiring firms to recognize an operating lease asset and liability on their balance sheets. With operating leases no longer off-balance sheet, firms that had heavily used operating leases appear more highly leveraged and riskier under ASC 842.

We find a negative relation between operating lease intensity and abnormal earnings announcement returns around the time that firms first recognize their operating leases. Using a

difference-in-difference research design, we find that the negative relation between operating lease intensity and abnormal announcement returns appears in 2019 when firms first report under ASC 842 and not before. Our finding is consistent with the recognition of operating leases causing a decline in the equity valuations of firms with significant operating leases, on average. We explore an increase in trade tensions between the United States and China during 2019 as a potential concurrent shock that could explain our finding but find no evidence that this explains our finding. Our finding suggests that equity investors had not been properly adjusting for firms' use of operating leases before ASC 842.

The change in lease accounting standard presented us with an opportunity to assess the market's level of financial statement analysis. If some other concurrent shock or chance cannot explain our results, then it appears that market prices may fail to fully reflect even relatively basic levels of financial statement analysis. Inconsistent with an efficient market, we find that equity investors react to a significant change in financial statements absent a significant change in underlying economic conditions. Our study demonstrates the importance of recognition on the financial statements rather than disclosure in a footnote. We contribute to the literature by documenting that this issue can matter even in the case of a common, longstanding, and well-known accounting distortion. Our results suggest that disclosure processing costs may be larger than they appear and that they can prevent investors from fully incorporating relevant footnote disclosures in their valuations. Accounting standards like ASC 842 can benefit financial statement users by eliminating disclosure processing costs.

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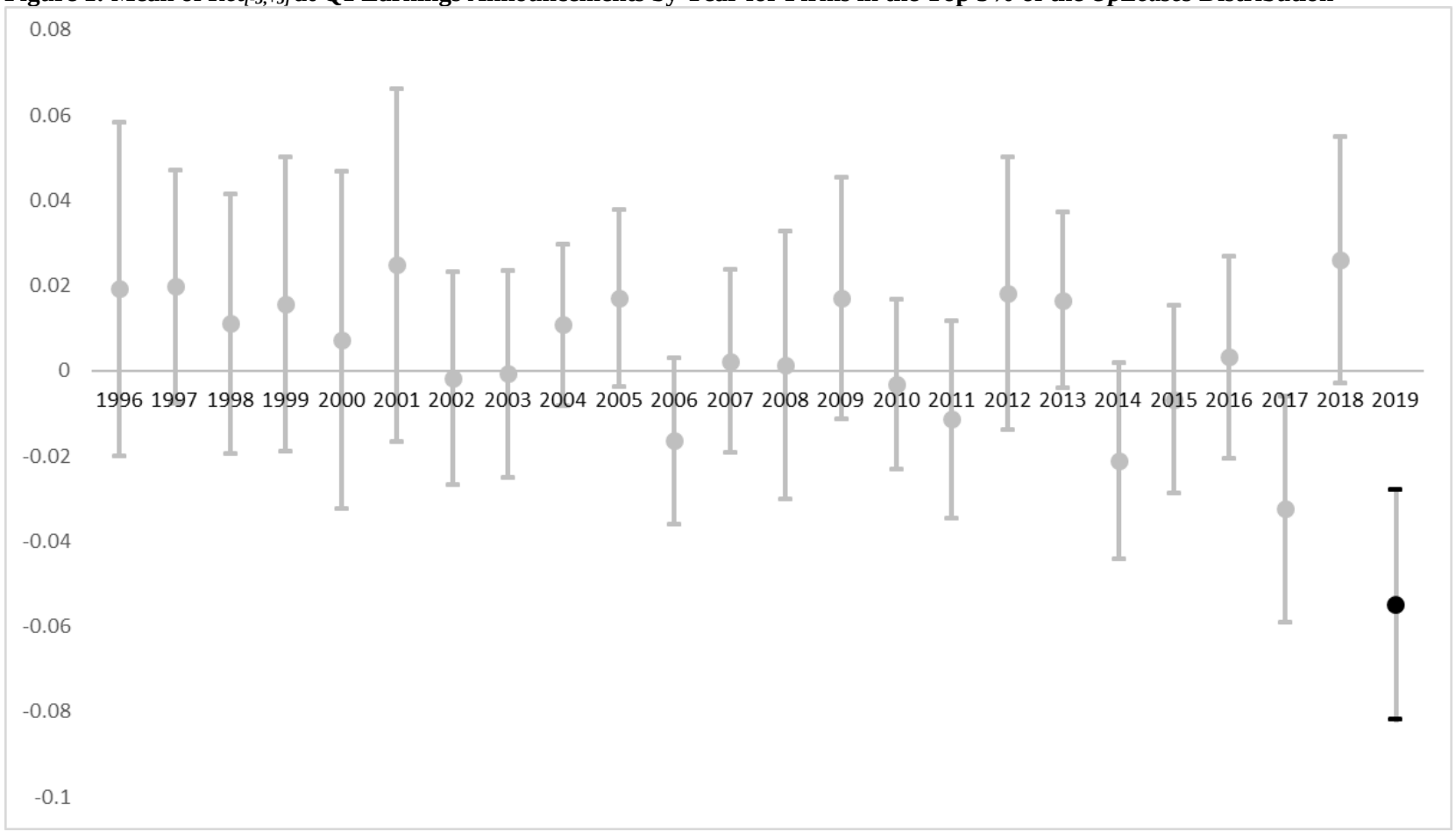
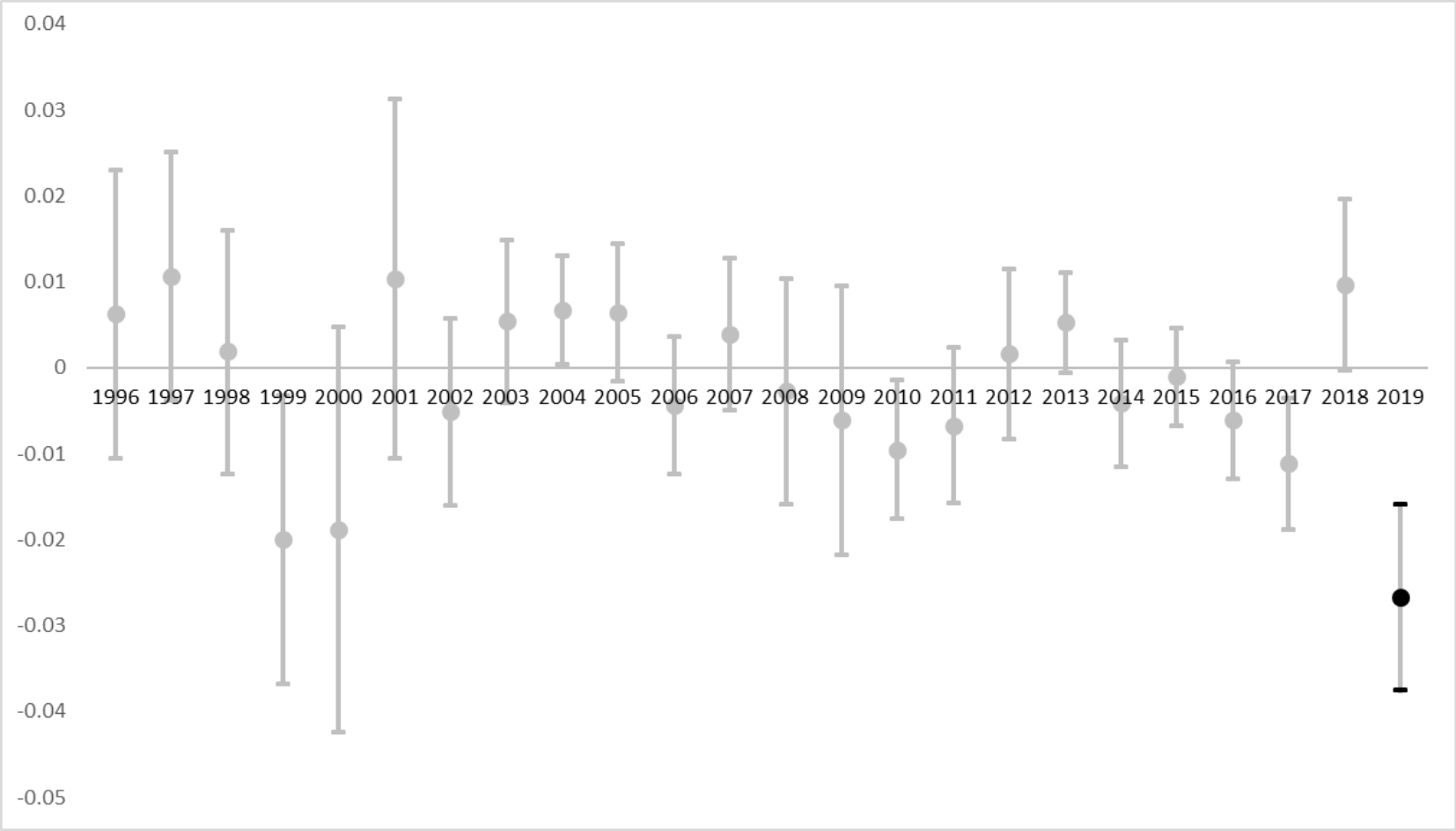
Figure 1: Mean of $Ret_{[-5,+5]}$ at Q1 Earnings Announcements by Year for Firms in the Top 5% of the *OpLeases* Distribution



This figure shows the mean of $Ret_{[-5,+5]}$ at first fiscal quarter earnings announcements by year for firms in the top 5% of the *OpLeases* distribution. $Ret_{[-5,+5]}$ is a firm's buy and hold abnormal returns over an 11-trading day windows (centered on the firm's first fiscal quarter earnings announcement date). *OpLeases* is a firm's operating lease intensity based on the operating lease footnote disclosure from the firm's previous 10-K. The graph presents the mean and its 95% confidence interval for each year. For emphasis, the 2019 mean and its 95% confidence interval limits are in black.

Figure 2: Coefficient Estimates for *OpLeases* from Yearly Regressions of $Ret_{[-5,+5]}$ on *OpLeases* and Controls for Risk



This figure shows the coefficient estimates for *OpLeases* from yearly regressions of $Ret_{[-5,+5]}$ on *OpLeases* and controls for risk. Specifically, we estimate equation (1) for each year from 1996 through 2019 (i.e., $Ret_{[-5,+5]} = \text{Intercept} + \beta_1 OpLeases + \beta_2 ESurp + \beta_3 Size + \beta_4 MB + \beta_5 Inv + \beta_6 Prof + \beta_7 Debt + \beta_8 EVol + \varepsilon$). $Ret_{[-5,+5]}$ is a firm's buy and hold abnormal returns over an 11-trading day windows (centered on the firm's first fiscal quarter earnings announcement date). *OpLeases* is a firm's operating lease intensity based on the operating lease footnote disclosure from the firm's previous 10-K. The graph presents the coefficient estimate for *OpLeases* and its 95% confidence interval for each year. For emphasis, the 2019 coefficient estimate and its 95% confidence interval limits are in black.

Figure 3: Cumulative Hedge Portfolio Return and 2019Q1 Earnings Announcements for High Operating Lease Firms

This figure shows the cumulative return on the operating lease hedge portfolio return (R_p) and the timing of 2019Q1 earnings announcements for firms in the top 10% of the *OpLeases* distribution for 2019. The operating lease hedge portfolio is a zero-investment portfolio that is long the firms in the top 10% of the *OpLeases* distribution for 2019 and short the firms with an *OpLeases* value of zero (i.e., firms that do not have operating leases). The graph plots the cumulative operating lease hedge portfolio return from 4/1/2019 through 12/31/2019.

Table 1: Descriptive Statistics

Panel A: First Quarter 2019 Earnings Announcements						
Variable	N	Mean	Std. Dev.	P25	P50	P75
OpLeases	1,779	0.28	0.52	0.02	0.12	0.30
$Ret_{[-1,+1]}$	1,779	-0.0049	0.0802	-0.0372	0.0003	0.0317
$Ret_{[-5,+5]}$	1,779	-0.0021	0.0960	-0.0449	0.0059	0.0441
ESurp	1,779	0.0003	0.0057	-0.0005	0.0005	0.0019
Size	1,779	11.05	37.71	0.90	2.26	6.92
MB	1,779	3.89	5.68	1.24	2.07	3.88
Inv	1,779	0.14	0.33	-0.01	0.05	0.16
Prof	1,779	0.25	0.42	0.11	0.21	0.34
Debt	1,779	1.26	1.92	0.28	0.73	1.39
EVol	1,779	0.022	0.030	0.005	0.011	0.025
Panel B: First Quarter Earnings Announcements 1996 – 2018						
OpLeases	32,995	0.32	0.59	0.02	0.13	0.33
$Ret_{[-1,+1]}$	32,995	0.0039	0.0763	-0.0310	0.0014	0.0372
$Ret_{[-5,+5]}$	32,995	0.0052	0.1026	-0.0451	0.0011	0.0503
ESurp	32,995	0.0004	0.0068	-0.0004	0.0004	0.0018
Size	32,995	7.19	24.05	0.61	1.49	4.32
MB	32,995	3.65	4.94	1.51	2.28	3.81
Inv	32,995	0.18	0.41	0.00	0.08	0.21
Prof	32,995	0.28	0.40	0.14	0.24	0.36
Debt	32,995	1.19	2.32	0.15	0.57	1.24
EVol	32,995	0.026	0.040	0.005	0.013	0.029

This table presents descriptive statistics for first quarter 2019 earnings announcements (panel A) and for first quarter earnings announcements from 1996 through 2018 (panel B). *OpLeases* is the firm's operating lease intensity. $Ret_{[-1,+1]}$ and $Ret_{[-5,+5]}$ are the firm's buy and hold abnormal returns over 3- and 11-trading day windows, respectively (centered on the firm's first fiscal quarter earnings announcement date). *ESurp* is the firm's analyst-based earnings surprise for the first quarter. *Size* is the firm's market capitalization in billions of dollars at the end of its previous fiscal year. *MB* is the firm's market-to-book ratio at the end of its previous fiscal year. *Inv* is the firm's growth in total assets at the end of its previous fiscal year. *Prof* is the firm's operating profitability at the end of its previous fiscal year. *Debt* is the firm's debt-to-equity ratio at the end of its previous fiscal year. *EVol* is the volatility of the firm's annual earnings over the most recent 5 years (measured at the end of its previous fiscal year). The samples consist of firms that file forms 10-K and 10-Q on the SEC's EDGAR website and that have December, January, or February fiscal year ends. The samples exclude firms with an end of fiscal year stock price less than five dollars, firms with market capitalizations less the NYSE tenth percentile, and firms with a negative book value. *OpLeases, ESurp, MB, Inv, Prof, Debt,* and *EVol* are winsorized at the 1% and 99% levels. More detailed variable descriptions are provided in Appendix 1.

Table 2: Operating Lease Intensity for 2019 by First-Digit of SIC Code

One-Digit SIC Code	Industry Description	N	Mean	Std. Dev.	P25	P50	P75	P90	P99
0	Agriculture, Forestry, and Fishing	1	0.49	NA	0.49	0.49	0.49	0.49	0.49
1	Mining and Construction	99	0.20	0.25	0.03	0.08	0.28	0.49	1.29
2	Manufacturing	263	0.27	0.36	0.08	0.17	0.34	0.57	2.00
3	Manufacturing	313	0.23	0.30	0.10	0.17	0.25	0.35	2.11
4	Transportation, Communications, and Utilities	156	0.18	0.30	0	0.05	0.23	0.52	1.57
5	Wholesale and Retail Trade	132	1.29	1.15	0.32	0.87	2.36	3.30	3.30
6	Finance, Insurance, and Real Estate	542	0.05	0.15	0	0.00	0.03	0.13	0.80
7	Services	218	0.36	0.41	0.13	0.24	0.43	0.76	2.10
8	Services	52	0.56	0.53	0.21	0.42	0.73	1.08	2.97
9	Public Administration and Nonclassifiable	3	0.13	0.07	0.09	0.09	0.21	0.21	0.21
All		1,779	0.28	0.52	0.02	0.12	0.30	0.64	3.30
All except 5		1,647	0.20	0.32	0.01	0.10	0.25	0.49	1.69

This table presents the distribution for *OpLeases* by first-digit SIC code for the first quarter 2019 earnings announcements sample. *OpLeases* is the firm's first year operating lease payment (*MRC1* from its fiscal year 2018 disclosure) capitalized as a perpetuity and scaled by total assets (*AT* from fiscal year 2018). We use the 10-year high quality market corporate bond par yield (*HQMCB10YRP*) of 4.06% on January 1, 2019 as the discount rate for the perpetuity.

Table 3: The Impact of Recognizing Operating Leases on High Operating Lease Firms

	Top 1%		Top 5%		Top 10%	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**
Increase in Assets	73%	67%	46%	46%	30%	19%
Increase in Liabilities	245%	252%	144%	107%	93%	51%
Debt-to-Equity (without)	0.30	0.16	0.75	0.34	1.88	0.38
Debt-to-Equity (with)	2.01	1.71	2.17	1.51	3.12	1.25
ROA (without)	7.01%	7.32%	5.41%	5.40%	2.63%	4.66%
ROA (with)	4.24%	4.61%	3.57%	4.35%	1.71%	3.88%
Current Ratio (without)	2.23	2.19	2.04	1.73	2.35	1.77
Current Ratio (with)	1.42	1.48	1.48	1.34	1.92	1.46
Asset Turnover (without)	2.12	2.12	1.69	1.74	1.50	1.46
Asset Turnover (with)	1.23	1.21	1.16	1.15	1.15	1.10
$Ret_{[-1,+1]}$	-6.11% [-2.29]	-5.49%	-3.53% [-2.92]	-1.79%	-2.10% [-2.53]	-1.17%
$Ret_{[-5,+5]}$	-12.34% [-4.42]	-13.83%	-5.50% [-4.08]	-3.78%	-3.10% [-3.26]	-1.81%
N	18		89		177	

This table presents the mean and median impact of recognizing operating leases on firms in the top 1%, top 5%, and top 10% of the *OpLeases* distribution for 2019. It also presents the mean and median market reactions to the 2019Q1 earnings announcements for these firms. *Increase in Assets* is the hand-collected right-of-use operating lease asset recognized on the 2019Q1 balance sheet divided by 2019Q1 total assets (excluding the right-of-use operating lease asset from total assets). *Increase in Liabilities* is the hand-collected operating lease liability recognized on the 2019Q1 balance sheet divided by 2019Q1 total liabilities (excluding the right-of-use operating lease liability from total liabilities). *Debt-to-Equity* is short-term debt (*DLC*) plus long-term debt (*DLTT*), scaled by common equity (*CEQ*). *ROA* is the sum of income (*IBCOMQ*) for 2019Q1 and the previous three quarters, scaled by total assets (*ATQ*). *Current Ratio* is current assets (*ACTQ*) divided by current liabilities (*LCTQ*). *Asset Turnover* is the sum of revenues (*REVTQ*) for 2019Q1 and the previous three quarters, scaled by total assets (*ATQ*). *With* indicates that the ratio was computed using the reported values from the 2019Q1 balance (i.e., the operating lease asset and liability are recognized). *Without* indicates that the ratio was computed as if the operating lease asset and liability had not been recognized on the 2019Q1 balance sheet (i.e., reported values from Compustat are adjusted for the hand-collected right-of-use operating lease asset and the operating lease liability). $Ret_{[-1,+1]}$ and $Ret_{[-5,+5]}$ are the firm's buy and hold abnormal returns over 3- and 11-trading day windows, respectively (centered on the firm's 2019Q1 earnings announcement date). t-statistics are in brackets.

Table 4: Pearson and Spearman Correlations

Panel A: First Quarter 2019 Earnings Announcements (N=1,779)

Variable	*OpLeases*	$Ret_{[-1,+1]}$	$Ret_{[-5,+5]}$	*ESurp*	*Size*	*MB*	*Inv*	*Prof*	*Debt*	*EVol*
OpLeases	1.00	-0.10***	-0.15***	0.02	-0.05**	0.14***	-0.05**	0.11***	-0.03	0.08***
$Ret_{[-1,+1]}$	-0.10***	1.00	0.84***	0.26***	0.00	0.02	-0.00	-0.04*	0.02	-0.02
$Ret_{[-5,+5]}$	-0.14***	0.81***	1.00	0.18***	-0.00	0.05**	0.03	-0.10***	0.01	-0.01
ESurp	0.04*	0.35***	0.25***	1.00	0.03	-0.00	-0.02	0.08***	-0.02	-0.03
Size	-0.06***	0.01	-0.01	0.03	1.00	0.12***	-0.03	0.12***	0.02	-0.06***
MB	0.41***	-0.02	0.01	-0.05**	0.28***	1.00	0.12***	0.30***	0.37***	0.23***
Inv	-0.05**	0.04	0.07***	-0.03	-0.06**	0.14***	1.00	-0.15***	-0.02	0.28***
Prof	0.20***	-0.10***	-0.16***	0.06**	0.26***	0.29***	-0.11***	1.00	0.47***	-0.18***
Debt	-0.17***	0.05**	0.06***	-0.00	0.12***	-0.03	-0.07***	0.29***	1.00	-0.05**
EVol	0.47***	-0.06**	-0.09***	0.04*	-0.11***	0.31***	0.00	-0.03	-0.18***	1.00

Panel B: First Quarter Earnings Announcements 1996 – 2018 (N=32,995)

Variable	*OpLeases*	$Ret_{[-1,+1]}$	$Ret_{[-5,+5]}$	*ESurp*	*Size*	*MB*	*Inv*	*Prof*	*Debt*	*EVol*
OpLeases	1.00	-0.01	-0.01	0.01	-0.07***	0.10***	-0.04***	0.11***	-0.06***	0.07***
$Ret_{[-1,+1]}$	0.01***	1.00	0.74***	0.24***	-0.01*	0.01	0.00	0.03***	0.01***	-0.03***
$Ret_{[-5,+5]}$	0.01	0.71***	1.00	0.22***	-0.01*	-0.00	0.01*	0.03***	0.01**	-0.03***
ESurp	0.04***	0.36***	0.33***	1.00	0.01*	0.01	-0.02***	0.04***	0.01	-0.01**
Size	-0.13***	-0.02***	-0.01	0.01	1.00	0.07***	-0.03***	0.09***	0.02***	-0.08***
MB	0.31***	-0.01	-0.02***	-0.03***	0.20***	1.00	0.08***	0.40***	0.40***	0.22***
Inv	-0.01**	0.01**	0.00	-0.04***	-0.04***	0.19***	1.00	-0.07***	-0.01	0.20***
Prof	0.14***	0.01***	0.03***	0.03***	0.23***	0.38***	0.03***	1.00	0.46***	-0.15***
Debt	-0.30***	0.01	0.02***	0.01	0.19***	-0.08***	-0.08***	0.22***	1.00	-0.08***
EVol	0.40***	-0.00	-0.02***	0.04***	-0.23***	0.26***	0.03***	-0.12***	-0.33***	1.00

This table presents Pearson (Spearman) correlation coefficients above (below) the diagonal. Panel A (panel B) presents the correlation coefficients for the first quarter 2019 (1996 – 2018) earnings announcements sample. *OpLeases* is the firm's operating lease intensity. $Ret_{[-1,+1]}$ and $Ret_{[-5,+5]}$ are the firm's buy and hold abnormal returns over 3- and 11-trading day windows, respectively (centered on the firm's first fiscal quarter earnings announcement date). *ESurp* is the firm's analyst-based earnings surprise for the first quarter. *Size* is the firm's market capitalization at the end of its previous fiscal year. *MB* is the firm's market-to-book ratio at the end of its previous fiscal year. *Inv* is the firm's growth in total assets at the end of its previous fiscal year. *Prof* is the firm's operating profitability at the end of its previous fiscal year. *Debt* is the firm's debt-to-equity ratio at the end of its previous fiscal year. *EVol* is the volatility of the firm's annual earnings over the most recent 5 years (measured at the end of its previous fiscal year). More detailed variable descriptions are provided in Appendix 1. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Table 5: Association between Operating Lease Intensity and Q1 2019 Earnings Announcement Returns

	(1) $Ret_{[-1,+1]}$	(2) $Ret_{[-5,+5]}$	(3) $Ret_{[-1,+1]}$	(4) $Ret_{[-5,+5]}$
Intercept	-0.0004	0.008**		
	[-0.16]	[2.42]		
OpLeases	-0.014***	-0.027***	-0.012**	-0.023***
	[-3.05]	[-4.84]	[-2.36]	[-3.71]
ESurp	3.79***	3.38***	3.85***	3.45***
	[8.60]	[5.40]	[8.76]	[5.57]
Size	-0.00002	-0.00004	-0.00001	-0.00004
	[-0.55]	[-1.20]	[-0.54]	[-1.07]
MB	0.001**	0.002***	0.001**	0.002***
	[1.97]	[3.91]	[2.43]	[3.86]
Inv	-0.004	0.001	-0.003	-0.001
	[-0.48]	[0.07]	[-0.42]	[-0.10]
Prof	-0.018***	-0.038***	-0.015**	-0.031***
	[-3.25]	[-5.21]	[-2.48]	[-4.17]
Debt	0.002	0.002	0.001	0.001
	[1.47]	[1.46]	[1.00]	[0.76]
EVol	-0.067	-0.176*	0.005	-0.018
	[-0.83]	[-1.84]	[0.05]	[-0.17]
Industry Fixed Effects	No	No	Yes	Yes
Adj. R^2	8.02%	7.91%	8.89%	9.55%
N	1,779	1,779	1,779	1,779

This table presents the results of multivariate regressions with buy and hold abnormal returns around first quarter 2019 earnings announcement dates as the dependent variable. In columns 1 and 3, the dependent variable is $Ret_{[-1,+1]}$, the 3-day window centered on the 2019Q1 earnings announcement date. In columns 2 and 4, the dependent variable is $Ret_{[-5,+5]}$, the 11-day window centered on the 2019Q1 earnings announcement date. *OpLeases* is the firm's operating lease intensity. *ESurp* is the firm's analyst-based earnings surprise for the first quarter. *Size* is the firm's market capitalization at the end of its previous fiscal year. *MB* is the firm's market-to-book ratio at the end of its previous fiscal year. *Inv* is the firm's growth in total assets at the end of its previous fiscal year. *Prof* is the firm's operating profitability at the end of its previous fiscal year. *Debt* is the firm's debt-to-equity ratio at the end of its previous fiscal year. *EVol* is the volatility of the firm's annual earnings over the most recent 5 years (measured at the end of its previous fiscal year). More detailed variable descriptions are provided in Appendix 1. Columns 3 and 4 include one-digit SIC code fixed effects. t-statistics are in brackets. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Table 6: Association between Operating Lease Intensity and Q1 Earnings Announcement Returns Pre- and Post-ASC 842

	(1)	(2)	(3)	(4)
	$Ret_{[-1,+1]}$	$Ret_{[-5,+5]}$	$Ret_{[-1,+1]}$	$Ret_{[-5,+5]}$
Intercept	0.003***	0.005***		
	[5.12]	[5.07]		
Y2019	-0.004**	0.001	-0.004**	0.001
	[-2.28]	[0.32]	[-2.19]	[0.43]
OpLeases	-0.001	-0.002	-0.002**	-0.003**
	[-1.43]	[-1.48]	[-1.99]	[-2.56]
OpLeases × Y2019	-0.014***	-0.027***	-0.014***	-0.027***
	[-3.07]	[-5.02]	[-3.11]	[-5.09]
ESurp	2.66***	3.31***	2.66***	3.30***
	[18.36]	[16.76]	[18.31]	[16.69]
Size	-0.00005***	-0.0001***	-0.00004***	-0.0001***
	[-4.96]	[-5.45]	[-4.22]	[-5.21]
MB	0.0002	0.0001	0.0002	0.00002
	[1.48]	[0.59]	[1.30]	[0.08]
Inv	0.002	0.005**	0.002	0.005**
	[1.39]	[2.52]	[1.26]	[2.47]
Prof	0.001	0.003	0.0004	0.002
	[0.73]	[1.43]	[0.24]	[1.05]
Debt	0.0001	0.0001	0.0002	0.0004
	[0.39]	[0.40]	[1.06]	[1.22]
EVol	-0.057***	-0.080***	-0.063***	-0.089***
	[-3.48]	[-3.51]	[-3.63]	[-3.73]
Industry Fixed Effects	No	No	Yes	Yes
Adj. R^2	5.81%	5.11%	5.86%	5.18%
N	34,774	34,774	34,774	34,774

This table presents the results of multivariate regressions with buy and hold abnormal returns around first quarter earnings announcement dates as the dependent variable. In columns 1 and 3, the dependent variable is $Ret_{[-1,+1]}$, the 3-day window centered on the first fiscal quarter earnings announcement date. In columns 2 and 4, the dependent variable is $Ret_{[-5,+5]}$, the 11-day window centered on the first fiscal quarter earnings announcement date. *Y2019* is an indicator variable equal to one for first quarter 2019 earnings announcements, and zero otherwise. *OpLeases* is the firm's operating lease intensity. *ESurp* is the firm's analyst-based earnings surprise for the first quarter. *Size* is the firm's market capitalization at the end of its previous fiscal year. *MB* is the firm's market-to-book ratio at the end of its previous fiscal year. *Inv* is the firm's growth in total assets at the end of its previous fiscal year. *Prof* is the firm's operating profitability at the end of its previous fiscal year. *Debt* is the firm's debt-to-equity ratio at the end of its previous fiscal year. *EVol* is the volatility of the firm's annual earnings over the most recent 5 years (measured at the end of its previous fiscal year). More detailed variable descriptions are provided in Appendix 1. Columns 3 and 4 include one-digit SIC code fixed effects. t-statistics are in brackets. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Table 7: Association between Operating Lease Intensity and Q1 2019 Earnings Announcement Returns for Retailers and Non-Retailers

	(1)	(2)	(3)	(4)
	One-Digit SIC = 5		One-Digit SIC ≠5	
	$Ret_{[-1,+1]}$	$Ret_{[-5,+5]}$	$Ret_{[-1,+1]}$	$Ret_{[-5,+5]}$
Intercept	-0.004	-0.005	-0.000	0.008**
	[-0.27]	[-0.25]	[-0.03]	[2.39]
OpLeases	-0.018**	-0.030***	-0.011*	-0.020**
	[-2.13]	[-3.05]	[-1.83]	[-2.38]
ESurp	4.22***	4.29**	3.74***	3.26***
	[2.69]	[2.51]	[8.12]	[4.89]
Size	-0.00002	0.00002	-0.00002	-0.0001
	[-0.55]	[0.45]	[-0.68]	[-1.44]
MB	0.003*	0.002	0.001	0.002***
	[1.92]	[1.16]	[1.52]	[3.41]
Inv	-0.0004	0.023	-0.003	-0.0004
	[-0.00]	[0.33]	[-0.43]	[-0.04]
Prof	-0.037	-0.003	-0.017***	-0.040***
	[-1.46]	[-0.11]	[-2.98]	[-5.31]
Debt	0.0001	-0.002	0.002	0.003
	[0.03]	[-0.39]	[1.33]	[1.64]
EVol	0.290	-0.296	-0.080	-0.173*
	[0.39]	[-0.41]	[-1.00]	[-1.78]
Adj. R^2	5.00%	7.08%	7.46%	6.21%
N	132	132	1,647	1,647

This table presents the results of multivariate regressions with buy and hold abnormal returns around first quarter 2019 earnings announcement dates as the dependent variable. In columns 1 and 3, the dependent variable is $Ret_{[-1,+1]}$, the 3-day window centered on the 2019Q1 earnings announcement date. In columns 2 and 4, the dependent variable is $Ret_{[-5,+5]}$, the 11-day window centered on the 2019Q1 earnings announcement date. In columns 1 and 2, the sample is restricted to firms having an SIC code with a first digit equal to 5. In columns 3 and 4, the sample is restricted to firms having an SIC code with a first digit not equal to 5. *OpLeases* is the firm's operating lease intensity. *ESurp* is the firm's analyst-based earnings surprise for the first quarter. *Size* is the firm's market capitalization at the end of its previous fiscal year. *MB* is the firm's market-to-book ratio at the end of its previous fiscal year. *Inv* is the firm's growth in total assets at the end of its previous fiscal year. *Prof* is the firm's operating profitability at the end of its previous fiscal year. *Debt* is the firm's debt-to-equity ratio at the end of its previous fiscal year. *EVol* is the volatility of the firm's annual earnings over the most recent 5 years (measured at the end of its previous fiscal year). More detailed variable descriptions are provided in Appendix 1. t-statistics are in brackets. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Table 8: Contemporaneous Association between Operating Lease Hedge Portfolio Returns and Daily Factor Returns

	(1) R_P	(2) R_P	(3) R_P	(4) R_P	(5) R_P	(6) R_P	(7) R_P
Intercept	-0.03	-0.14***	-0.02	-0.02	-0.003	-0.14***	-0.13***
	[-0.45]	[-3.03]	[-0.32]	[-0.51]	[-0.21]	[-3.02]	[-3.03]
Y2019					-0.12**		
					[-2.22]		
R_M - R_F	0.07	0.20***	0.21***	0.23***	0.15***	0.20**	0.02
	[0.70]	[2.73]	[3.37]	[2.80]	[7.60]	[2.64]	[0.25]
SMB	0.27	0.41***	0.28**	0.49***	0.39***	0.39***	0.25**
	[1.32]	[3.52]	[2.20]	[4.16]	[10.76]	[2.97]	[2.38]
HML	-0.64***	-0.53***	-0.35***	-0.36***	-0.70***	-0.56***	-0.51***
	[-3.93]	[-4.41]	[-2.76]	[-2.74]	[-15.64]	[-4.66]	[-4.15]
RMW	0.07	0.51***	0.95***	1.10***	0.03	0.49***	0.45***
	[0.32]	[3.75]	[4.90]	[4.59]	[0.59]	[3.48]	[3.27]
CMA	-0.08	0.04	0.23	-0.11	0.16**	0.06	-0.07
	[-0.27]	[0.26]	[0.93]	[-0.53]	[2.40]	[0.41]	[-0.45]
CHINA						0.03	
						[0.57]	
RETAIL							0.16***
							[3.07]
Adj. R^2	35.50%	48.87%	43.91%	40.32%	41.35%	48.18%	54.22%
N	61	63	64	64	1,518	63	63
Period	2019Q1	2019Q2	2019Q3	2019Q4	Q2:1996-2019	2019Q2	2019Q2

This table presents the results of time-series regressions of daily contemporaneous operating lease hedge portfolio returns (R_p) on the daily returns to the Fama-French five-factors and the daily returns to two portfolios meant to proxy for exposure to risk related to the U.S. trade tensions with China. The operating lease hedge portfolio is a zero-investment portfolio that is long the firms in the top 10% of the *OpLeases* distribution for 2019 and short the firms with a 2019 *OpLeases* value of zero (i.e., firms that do not have operating leases). In columns 2, 6, and 7, the sample consists of the daily returns during the 63 trading days in the second quarter of 2019 (April – June). In column 5, the sample consists of the daily returns during the 1,518 trading days in April - June for 1996 through 2019. In columns 1, 3, and 4, the sample consists of the daily returns during the first, third, and fourth quarters of 2019, respectively. *Y2019* is an indicator variable for daily returns from 2019, and zero otherwise. R_M - R_F is the daily return on the value-weighted market index less the daily risk-free rate. *SMB* is the daily return on a portfolio of stocks with low market capitalizations in excess of the daily return on a portfolio of stocks with high market capitalizations. *HML* is the daily return on a portfolio of stocks with low market-to-book ratios in excess of the daily return on a portfolio of stocks with high market-to-book ratios. *RMW* is the daily return on a portfolio of stocks with high profitability in excess of the daily return on a portfolio of stocks with low profitability. *CMA* is the daily return on a portfolio of stocks with low asset growth in excess of the daily return on a portfolio of stocks with asset growth. *CHINA* is the daily excess return on the China Exposure Index by Fathom Consulting. *RETAIL* is the daily excess return on a portfolio of 10 retail stocks identified by UBS as most sensitive to U.S. trade tensions with China. t-statistics are in brackets. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Table 9: Association between Operating Lease Intensity and Returns after Q1 2019 Earnings Announcements

	(1)	(2)	(3)	(4)	(5)
	$Ret_{[-5,+5]}$	$Ret_{[+6,+16]}$	$Ret_{[+17,+27]}$	$Ret_{[+28,+38]}$	$Ret_{[+39,+49]}$
Intercept	0.008**	-0.005**	-0.004**	-0.010***	-0.004**
	[2.42]	[-2.22]	[-2.00]	[-4.97]	[-2.41]
OpLeases	-0.027***	-0.007**	-0.005**	0.006*	-0.006*
	[-4.84]	[-2.29]	[-2.15]	[1.76]	[-1.89]
ESurp	3.38***	0.040	-0.023	-0.31	0.55*
	[5.40]	[1.11]	[-0.06]	[-0.66]	[1.67]
Size	-0.00004	0.0001***	-0.00002	0.0001***	-0.00001
	[-1.20]	[2.67]	[-0.74]	[4.58]	[-0.91]
MB	0.002***	0.002***	0.001***	0.00001	0.001**
	[3.91]	[4.82]	[3.13]	[0.02]	[2.31]
Inv	0.001	0.007	0.007	0.001	0.004
	[0.07]	[1.24]	[1.12]	[0.16]	[0.72]
Prof	-0.038***	-0.016**	-0.002	0.003	-0.005
	[-5.21]	[-2.52]	[-0.35]	[0.52]	[-0.89]
Debt	0.002	-0.0001	-0.002***	-0.001	-0.0002
	[1.46]	[-0.13]	[-2.76]	[-0.66]	[-0.19]
EVol	-0.176*	-0.404***	-0.213**	0.204***	-0.170***
	[-1.84]	[-6.08]	[-2.32]	[2.96]	[-2.85]
Adj. R^2	7.91%	4.98%	1.45%	1.21%	1.21%
N	1,779	1,779	1,779	1,779	1,779

This table presents the results of multivariate regressions with buy and hold abnormal returns around and after first quarter 2019 earnings announcement dates as the dependent variable. In column 1, the dependent variable is $Ret_{[-5,+5]}$, the 11-day window centered on the 2019Q1 earnings announcement date. In columns 2, 3, 4, and 5, the dependent variable is the 11-day window beginning 6, 17, 28, and 39 trading days after the 2019Q1 earnings announcement date. *OpLeases* is the firm's operating lease intensity. *ESurp* is the firm's analyst-based earnings surprise for the first quarter. *Size* is the firm's market capitalization at the end of its previous fiscal year. *MB* is the firm's market-to-book ratio at the end of its previous fiscal year. *Inv* is the firm's growth in total assets at the end of its previous fiscal year. *Prof* is the firm's operating profitability at the end of its previous fiscal year. *Debt* is the firm's debt-to-equity ratio at the end of its previous fiscal year. *EVol* is the volatility of the firm's annual earnings over the most recent 5 years (measured at the end of its previous fiscal year). More detailed variable descriptions are provided in Appendix 1. t-statistics are in brackets. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Table 10: Association between Recognized Operating Lease Intensity and Q1 2019 Earnings Announcement Returns for Retailers

	(1)	(2)
	One-Digit SIC = 5	
	$Ret_{[-1,+1]}$	$Ret_{[-5,+5]}$
Intercept	-0.0003	-0.002
	[-0.02]	[-0.10]
ROU_Asset	-0.15*	-0.22**
	[-1.95]	[-2.53]
ESurp	4.09**	4.06**
	[2.62]	[2.38]
Size	-0.00002	0.00003
	[-0.55]	[0.77]
MB	0.003*	0.002
	[1.91]	[1.08]
Inv	0.006	0.03
	[0.08]	[0.47]
Prof	-0.035	-0.003
	[-1.33]	[-0.11]
Debt	-0.0001	-0.001
	[-0.02]	[-0.23]
EVol	0.290	-0.357
	[0.38]	[-0.48]
Adj. R^2	5.78%	7.09%
N	132	132

This table presents the results of multivariate regressions with buy and hold abnormal returns around first quarter 2019 earnings announcement dates as the dependent variable. In column 1, the dependent variable is $Ret_{[-1,+1]}$, the 3-day window centered on the 2019Q1 earnings announcement date. In column 2, the dependent variable is $Ret_{[-5,+5]}$, the 11-day window centered on the 2019Q1 earnings announcement date. In columns 1 and 2, the sample is restricted to firms having an SIC code with a first digit equal to 5. *ROU_Asset* is the right-of-use operating lease asset recognized on the firm's balance (from their 2019Q1 10-Q), scaled by total assets. *ESurp* is the firm's analyst-based earnings surprise for the first quarter. *Size* is the firm's market capitalization at the end of its previous fiscal year. *MB* is the firm's market-to-book ratio at the end of its previous fiscal year. *Inv* is the firm's growth in total assets at the end of its previous fiscal year. *Prof* is the firm's operating profitability at the end of its previous fiscal year. *Debt* is the firm's debt-to-equity ratio at the end of its previous fiscal year. *EVol* is the volatility of the firm's annual earnings over the most recent 5 years (measured at the end of its previous fiscal year). More detailed variable descriptions are provided in Appendix 1. t-statistics are in brackets. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Appendix 1: Variable Descriptions

This appendix provides variable descriptions with source identifiers in bold italics. The main dependent variable ($Ret_{[-X,+X]}$) and the control variable *ESurp* correspond to first quarter earnings announcements for the current fiscal year (e.g., 2019Q1 for the main sample). The main independent variable of interest, *OpLeases*, and the control variables *Size*, *MB*, *Inv*, *Prof*, *Debt*, and *EVol* are calculated based on the annual values from the previous fiscal year (e.g., fiscal year 2018 for the main sample).

Variable	Description
$Ret_{[-1,+1]}$ $Ret_{[-5,+5]}$	The firm's buy and hold abnormal return over a 3- or 11-trading day window centered on the firm's first fiscal quarter earnings announcement date (***RDQ***). The proxy for the market return (R_m) is the return on the CRSP value-weighted index. X represents the one or five days before and after the earnings announcement date, resulting in 3- or 11-trading day windows. $$Ret_{[-X,+X]} = \prod_{-X}^{+X}(1 + R_{i,t}) - \prod_{-X}^{+X}(1 + R_{m,t})$$
OpLeases	The intensity with which a firm uses operating leases. We define this as the firm's first future annual operating lease payment (***MRC1***) capitalized as a perpetuity and scaled by total assets (***AT***). We use the 10-year high quality market corporate bond par yield (***HQMCB10YRP***) at the beginning of the calendar year (e.g., January 1, 2019 for the main sample) as the discount rate for the perpetuity. $$= \frac{\left(\frac{\boldsymbol{MRC1}}{\boldsymbol{HQMCB10YRP}}\right)}{\boldsymbol{AT}}$$
ESurp	The firm's first quarter earnings surprise from the IBES unadjusted surprise history file (***actual*** – ***surpmean***), scaled by its stock price at the end of its first fiscal quarter (***PRCCQ***).
Size	The firm's market capitalization in billions of dollars at the end of its previous fiscal year (***PRCC_F*** × ***CSHO***).
MB	The firm's market-to-book ratio defined as the firm's market capitalization at the end of its previous fiscal year (***PRCC_F*** × ***CSHO***), scaled by common equity (***CEQ***).
Inv	The firm's growth in total assets (***AT***) over the previous fiscal year.
Prof	The firm's profitability for the previous fiscal year, defined as annual revenues (***REVT***) less cost of goods sold (***COGS***), SG&A expense (***XSGA***), and interest expense (***XINT***), scaled common equity (***CEQ***).
Debt	The firm's debt-to-equity ratio for the previous fiscal year, defined as short-term debt (***DLC***) plus long-term debt (***DLTT***), scaled by common equity (***CEQ***).
EVol	The standard deviation of earnings over the most recent five years, where earnings is defined as earnings before extraordinary items (***IBCOM***), scaled by average total assets (***AT***).
Y2019	Indicator variable equal to one for first quarter 2019 earnings announcements, and zero otherwise.
ROU_Asset	The right-of-use operating lease asset that firms first recognize on their 2019Q1 balance sheets (hand-collected), scaled by total assets.