The Effect of Operating Lease Capitalization on Borrowing Costs in the Retail Industry

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ABSTRACT

This study examines whether operating lease capitalization requirements under Accounting Standards Codification (ASC) 842 – Leases affects a firm's cost of debt. The research employs a combination of logistic regression and discriminant analysis to evaluate changes in borrower characteristics associated with changes in borrowing costs before and after ASC 842 adoption for seventy-one retail firms. This study documents that the mean cost of debt increased thirty basis points and ten basis points in the 2-year period following ASC 842 adoption when compared to the 2-year and 5-year periods prior to ASC adoption, respectively. The borrower characteristics most responsible for the increases in cost of debt were existing leverage, asset fixity, and profitability. However, contrary to expectations, the incremental change in the cost of debt was not statistically significant. The findings suggest that lease capitalization has not materially affected retailers' cost of debt. It seems lenders understand the underlying economics and characteristics of operating leases and as a result, any impact from lease capitalization is already "baked-in." However, ASC 842 affects borrowers' leverage, profitability, and non-lease fixed assets ratios; combined, these factors may have a significant effect on loan covenants or other agreements that use these ratios.

Keywords: ASC 842, Operating Leases, Borrowing Costs, Borrower Characteristics, Retail Industry

INTRODUCTION

Many industries are reliant on operational, fixed lease commitments, but historically, these arrangements were kept off-balance sheet. In fact, many firms in the past intentionally structured their leases as operating leases to avoid the complexities of capitalizing leases. However, the Securities and Exchange Commission (2003), among others, viewed this norm negatively. In response, the Financial Accounting Standards Board (FASB) codified a revised leasing standard, *Accounting Standards Codification (ASC) 842 - Leases*, effective January 2019 for publicly traded entities. Unlike its predecessor ASC 840, ASC 842 introduced a lessee model that brought most operating leases onto the balance sheet to enhance transparency and comparability (FASB, 2016). Literature examining both the implementation challenges surrounding the new standard (Binfarè et al., 2020; Yoon, 2020) and its economic impacts (Hunsader et al., 2022; Lyons, 2022; Milian & Lee, 2021) is emerging. One remaining unanswered economic question is how the inclusion of operating leases on the balance sheet will affect a firm's cost of debt (Chatfield et al., 2017; Ferreira et al., 2022; Spencer & Webb, 2015). In this paper, we analyze this question through a combination of logistic regression and discriminant analysis by evaluating the change in borrower costs associated with changes in borrowing characteristics.

An oft cited *raison d'être* for ASC 842 is increased financial transparency (Grant, 2016). Not surprisingly, literature affirms an inverse relationship between financial transparency and the cost of debt, that is, greater financial transparency leads to lower borrowing costs (see e.g., Andrade et al., 2014; Muttakin et al., 2020; Sengupta, 1998). Yet, there are downsides to ASC 842 adoption, including inferior debt, capital, and profitability ratios post adoption (see e.g., Caster et al., 2018; Chatfield, et al., 2017; Fafatas & Fischer, 2016; Forbes & Gupta, 2019; Lee et al., 2014; Singh, 2012). On this point, literature also affirms an inverse relationship between financial performance and the cost of debt, but here, weaker financial performance leads to higher borrowing costs (Ramerman, 2019; Santosuosso, 2014). Considering this economic paradox, one could expect lower borrowing costs post ASC 842 adoption due to increases in financial transparency. Yet, on the other hand, one could foresee higher borrowing costs post implementation due to weaker financial ratios and financial positions. Our study aims to address this conundrum.

Our inquiry is relevant because debt and leasing are considered partial (not one-for-one) substitutes in the retail industry (Singh, 2013); that is to say, more leasing generally means less debt capacity and vice-versa. Traditional finance literature espousing a debt-lease trade-off suggests that firms try to keep their debt ratios at a level where the benefit of the debt is offset by the cost of the debt (Koh and Jang, 2009). With higher debt ratios arising from ASC 842's lease capitalization requirement, it is plausible that lenders may impose additional financing costs, i.e., higher interest rates, especially for those firms with preexisting restrictive covenants (Singh, 2012), thereby altering a firm's cost/benefit equilibrium. Alternatively, we can conceive situations whereby managers intentionally decide to alter the debt-lease mix by either canceling (selling) or leasing (purchasing) fixed assets due to changes in relevant financing costs. Either way, understanding the actions of lenders and managers arising from changes in accounting requirements aids our general comprehension of credit-related decision-making and its associated economic impacts.

To understand the effects of ASC 842 on borrowing costs, we focus on borrower characteristics because traditional bank loan spreads are determined by borrower characteristics

(Ivashina, 2009). Specifically, our study adopts borrower characteristics from the debt covenant literature that are associated with changes in borrowing costs (see e.g., Bradley & Roberts, 2015; Carrizosa & Ryan, 2017; Ismail; 2014). Here, these factors affect the inclusion and severity of covenants which in turn affect borrowers' effective interest rates; among these factors are existing leverage, firm size, asset fixity, profitability, cash flow volatility, and future growth opportunity (Bradley & Roberts, 2015). We model three scenarios which capture borrower characteristics and associated financing costs surrounding the 2019 adoption of ASC 842, including 2-year averages post ASC 842 adoption, 2-year averages prior to ASC 842 adoption, and 5-year averages prior to ASC 842 adoption, the latter controlling for (a) the possibility that lenders modified credit assessments well in advance of the anticipated 2019 effective date, (b) unobservable firm characteristics, and (c) time-varying industry cycles. Like other accounting studies looking at changes in accounting standards (see e.g., Barthelme et al., 2019; Bryce et al., 2015; Schaberl & Victoravich, 2015), we used these scenarios in a pre-post study design with the adoption of ASC 842 as the intervening event. To achieve our aims, we concentrate on the retail industry which is profoundly dependent on operating leases (Fuller et al., 2021; Shaked & Orelowitz, 2017) and the industry is the most impacted by ASC 842 (Forbes & Gupta, 2019; Fuller et al., 2021).

Through multivariate analysis, we document that mean borrowing costs increased 30 basis points (5% increase) in the 2-year period following ASC 842 adoption compared to the 2-year period prior to ASC adoption. Likewise, we observe a mean ten basis point increase (2% increase) following ASC 842 adoption compared to the 5-year period preceding ASC 842 adoption. These findings are in line with Chen et al. (2019) who documented increases in borrowing costs following revised lease capitalization rules internationally. The borrower characteristics most responsible for the increases in borrower costs were leverage, asset fixity (PPE to Assets), and profitability (EBITDA to Assets). However, contrary to expectations, the negative impact of increased leverage and lower earnings after the implementation of ASC 842 was not significant; here, our main finding is more consistent with Altamuro et al. (2014) who reported that operating leases in the retail sector are less meaningful in lenders' credit risk assessments relative to the other sectors. As suggested by Altamuro et al. (2014), it is plausible that lenders view retail sector operating leases as true rentals rather than liabilities. In this study, we also document that retail firms appear to experience degradation in some balance sheet ratios following the capitalization of operating leases, in particular a greater degree of leverage, with offsetting decreases in profitability and lower levels of non-lease fixed assets. These results are consistent with earlier pre-adoption literature (see e.g., Caster et al., 2018; Chatfield, et al., 2017; Fafatas & Fischer, 2016; Forbes & Gupta, 2019; Lee et al., 2014; Singh, 2012).

Our findings support the notion that operating lease capitalization may not be relevant to credit risk, i.e., merchant creditworthiness, even though we document marginal increases in the cost of debt following ASC 842 adoption. As such, we make the following contributions. First, we document that those outcomes previously associated with ASC 842 adoption, including increased financial transparency and inferior financial ratios, seem less relevant to both lenders' credit risk assessments and to the cost of funds to the borrower than was previously assumed. We suggest several reasons for this including the possibility that lenders place greater emphasis on profit margins and free cash flow over any balance sheet effects arising from lease capitalization. This idea is supported by Durocher and Fortin (2009) who cite the prominent role that operating lease-related expenses play in lender assessments concerning the borrower's profitability and ability to repay. We also suggest that lenders have long understood that operating lease activity is

commonplace in the retail industry. In this regard, we agree with Altamuro et al. (2014) who suggest that bankers understand the underlying economics and characteristics of operating leases and as a result, the impact of lease capitalization is already "baked-in." A second contribution lies in the identification of three borrower characteristics that are associated with increases in borrower costs following a change in a lease accounting standard. Versus the earlier lease standard, ASC 842 appears to affect borrowers' leverage, profitability, and non-lease fixed assets ratios; combined, these factors may have a significant effect on loan covenants or other agreements that use these ratios, especially in the retail industry.

The rest of this paper is structured as follows: The following section examines earlier literature explaining the relationship between credit assessments and operating leases, the change in borrowing costs post lease capitalization, and debt covenant factors associated with changes in the cost of debt. After developing our hypothesis, we discuss our method including our sample and data collection process, our variables, and our research design. Finally, after describing the empirical results, we state limitations, propose areas for future research, and offer reasonable inferences of our study.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Operating leases are leases "that don't present an opportunity for the lessee to gain ownership of an asset" (Cote, 2021, para. 6). Literature suggests that retailers rely heavily on operating leases (Fafatas & Fischer, 2016; Imhoff et al., 1997; Maurer, 2020; Pérez et al., 2014). Both Altamuro et al. (2014) and Chun et al. (2003) propose that retail leasing is driven by the economic benefits of short lease terms relative to a shopping center's long term economic life. In this regard, store leases assume the appearance of rentals rather than financed asset purchases (Altamuro et al., 2014). Because of the retail industry's reliance on operating leases, BDO (2016) considers the industry significantly affected by the new lease standard.

Credit Assessments and Operating Leases

There is mixed empirical evidence of the importance of operating lease activity in lender credit assessments. In Canada, Durocher and Fortin (2009) surveyed 65 bank officials to identify their perceptions of the extent to which they considered operating and capital (finance) leases in their credit-granting process. Like the accounting environment in the US prior to ASC 842, Canadian generally accepted principles at the time of the survey required the capitalization of certain lease contracts but permitted the disclosure of operating lease commitments in the financial statement footnotes. Comparing the two lease forms, Durocher and Fortin found that bankers gave significantly more consideration to capital lease information than to operating lease information when analyzing business loan requests. Almost 70% of surveyed bank officials did not adjust financial statements to incorporate off-balance sheet lease information. Investigating whether the adoption of operating lease capitalization requirements in Canada would change their credit assessment, the short answer was yes. Here, bankers perceived that their ability to evaluate lease commitments would improve, and that they would increase their estimates of risks involved in supplying financing to lessees. Bankers suggested they would have to lower some lessees' credit ratings and might need to renegotiate their borrower covenants. Specific to the retail industry, their results suggested that changes to operating lease accounting would affect

bankers' credit-granting assessment related to the capital structure/solvency of the firm and their risk ratings.

A more recent study by Altamuro et al. (2014) explores whether operating leases are incorporated into banks' credit evaluations through loan interest rate spreads and how lessee/lease characteristics affected those same values. Using 5,812 bank loans on US companies with operating leases for the period 2000-2009, the authors find that the use of operating leases are positively associated with loan spreads, and that higher operating lease users experienced loan spreads that were 55 basis points higher (or, 31%) than lower operating lease users. Given that banks appear to price operating leases into their credit decisions, Altamuro et al. then examined the means through which this process occurs. It seems that credit ratings are a reasonable avenue for obtaining any off-balance sheet adjustments as credit rating agencies adjust for operating lease capitalization; however, for firms without a credit rating, financial ratios adjusted for capitalization serve as a proxy. These results however are concentrated in larger lenders. Interestingly, a cross-sectional analysis reveals that operating leases in the retailing industry are less relevant in credit risk assessment; the authors suspect that retail operating leases most resemble ''true'' leases. In other words, it can be inferred that lenders view retail leases as rentals rather than liabilities. In sum, but in contrast with Durocher and Fortin, the authors propose that banks not only price operating leases into their credit evaluations, but they do so with an understanding of the lease's underlying characteristics. Also contrasting with Durocher and Fortin, the impact of operating lease capitalization in retail is less relevant given the nature of the industry.

Borrower Costs After Transitioned Lease Accounting

Operating leases may play some role in credit assessments and setting interest rates. In the previous section, however, we cited research that was conducted before standard setters changed international and US operating lease accounting rules, respectively. A better question, therefore, is what role do leases play in the cost of borrowing following changes in capitalization requirements? Efficient market theory would suggest that capitalization should not affect borrowing costs because savvy creditors are aware of leasing commitments regardless of whether they are presented on- or off-balance sheet. However, surprisingly, results from empirical literature are mixed.

Chen et al. (2019) document an increase in firm-level borrowing costs following adoption of new lease capitalization rules in Cyprus, the Czech Republic, Greece, Italy, the Slovak Republic, and Turkey between 2003 and 2005. Here, the authors use a change in lease standards from an operating lease model where no capitalization was needed to a hybrid lease model where capitalization of certain leases were mandated in the six countries. Analyzing a sample of syndicated loans from *DealScan*, the authors find that borrowing costs increased by 60 basis points following the adoption of lease capitalization standards. Their findings provide evidence that the information sets of creditors changed following lease capitalization and adjusted financing terms in response.

A corollary study to Chen et al. by Kaufinger and Neuenschwander (2021) does not address borrowing costs directly but does reveal heightened financial risk and greater bankruptcy risk for certain retailers in the US post ASC 842 adoption. The authors' key takeaway is that greater transparency arising from ASC 842 could raise creditors' concerns that some retail firms' financial positions are weaker than they appear, thereby making it more difficult for retail firms

to secure advantageous interest rates. In short, their results raise the question as to whether some retail businesses will see higher interest rates simply because they appear riskier, post capitalization? While traditional finance literature might conjecture "no" (e.g., Wilkins & Zimmer, 1983), the authors did not specifically answer this question.

Another recent but contrarian study by Eriksson and Thran (2019) exploited the change in lease accounting between International Accounting Standard (IAS) 17 and International Financial Reporting Standard (IFRS) 16. IAS 17 was equivalent to the former lease accounting standard in the US, i.e., ASC 840, and IFRS 16 is an equivalent standard to ASC 842 (Morales-Díaz & Zamora-Ramírez, 2018). Using 213 publicly traded Swedish firms across multiple industries for the period 2006-2017, the authors document that IFRS 16 adoption, to a weak extent, had a lowering effect on the cost of borrowing. Here, a 1% increase in capitalized operating leases (in relation to total assets) results in a 0.68% decrease in the cost of debt. While macroeconomic issues following the 2008 subprime crisis may have contributed to the contrarian results, it is also plausible that reductions in information asymmetries following operating lease capitalization could be beneficial in terms of decreasing entities' borrowing costs. Regardless, the effect on the cost of debt is still uncertain.

Factors Associated with a Change in the Cost of Debt

Given the mixed results to date on lease capitalization and the cost of debt, a critical research design element is the identification of explanatory variables that clarify whether lease capitalization affects the cost to borrow funds. Examining earlier literature, Chen et al. (2019) opted to regress loan spreads against loan-level characteristics which included loan rating, the life of the loan, the loan amount, the loan's purpose, and loan term, among others, to achieve their findings. In contrast, Eriksson and Thran (2019) decided to regress the cost of debt (interest expense) against various balance sheet accounting values relative to total assets. In our study we consider whether the characteristics of the borrower are better determinants than loan-level characteristics or straight balance sheet values; here, borrower characteristics are observable, quantifiable factors and are based on financial ratios relating to firm size, leverage, and performance (Hollander & Verriest, 2016). Borrower characteristics, therefore, are proxies for credit risk, that is, firm creditworthiness (Adam & Streitz, 2016).

Debt covenant literature supplies insight into specific borrower characteristics that affect the inclusion of debt covenants and the borrower's interest rate (see e.g., Bradley & Roberts, 2015; Carrizosa & Ryan, 2017; Ismail; 2014). Leveraging factors from the debt covenant literature is germane to our study because of the modest link between lenders' debt covenant definitions and operating leases (Graden, 2018). According to Graden, leases vary in their effect on credit risk; as such, lenders discriminate among leases when designing debt covenants. Using 111 lending agreements between 2008 and 2011, of which 60% were associated with the retail sector, Graden discovered that lenders tailor debt covenant definitions and that this is especially true for borrowers with operating leases. Gruden also suggests that a primary reason for the discriminant treatment is due to bankruptcy laws which affect the lender's ability to recapture principal. In essence, a borrower with operating leases may be deemed as having a disguised security risk and the lender's pro rata distribution of bankruptcy proceedings will be diluted because of the existence of a lessor.

Specific to this paper, we adopt six factors from Bradley and Roberts (2015), including:

- Book Leverage - a measure of long-term debt

- Market Capitalization - a measure of firm size
- Market-to-Book - a measure of future growth opportunity
- PPE to Assets - a measure of asset fixity, assessing productive assets trapped in property, plant, and equipment
- EBITDA to Assets - a measure of profitability
- Cash Flow Volatility - a measure of cash management

Collectively, these borrower characteristics allow us to infer a retailer's credit risk, i.e., creditworthiness, in the equations we estimate. We established their relevance to our study based on the preponderance of their use in literature investigating firm borrowing costs (see e.g., Chiu et al., 2021; Kim et al., 2019; Valta, 2012).

Borrower Costs

A final key detail is how literature has operationalized the cost to borrow, specifically costs associated with long-term credit. Authors have used various degrees of complexity when estimating these costs. At one extreme, Eriksson and Thran (2019) defined borrower costs as "interest expense divided by the average interest-bearing debt outstanding (p.19)." On the other extreme, Florou and Kosi (2015) and Chiu et al. (2021) express the cost of debt financing as the all-in amount the borrower pays in basis points over a benchmark rate such as LIBOR. Lacking access to richer data environments, we opted for the use of annual 10-K financial statement data to estimate borrower costs, following Ericksson and Thran's parsimonious approach.

Summary and Hypothesis

In this study, we exploit a change in lease accounting standards in the US to understand the effects of operating lease capitalization on the cost of debt. Earlier literature that examined changes in the cost of debt following changes in leasing standards is mixed, with some literature revealing higher borrowing costs (e.g., Chen et al., (2019) and other literature revealing lower borrowing costs (e.g., Eriksson and Thran, 2019). To address this conundrum, we turn to debt covenant literature, adopting six borrower characteristics as proxies for credit risk. Following earlier research, our expectation is that there will be a change in borrower costs as we expect that greater transparency and/or decreases in information asymmetry will provide lenders a clearer window into the creditworthiness of merchants following operating lease capitalization. We do not estimate the direction of the change, however. We hypothesize *that there is no difference in credit risk as reflected in the cost of debt between the former lease accounting standard and the updated lease accounting standard in the retail sector.*

RESEARCH METHOD

Sample and Data Collection

Consistent with Hansson and Pettersson's (2020) study on IFRS 16, our initial sample begins with all available publicly traded, consumer discretionary retail firms as of December 2021 in the Mergent Online™ by FTSE Russell database. Here, consumer discretionary includes retail firms classified as diversified retailers, apparel retailers, home improvement retailers, or specialty retailers, and are identified by industry classification benchmark (ICB) code 404010.

Limiting our data pull to US-based organizations, our initial dataset consisted of 359 retail firms. We dropped firms with missing stock ticker symbols or firms classified by Mergent Online™ as "inactive," reducing our dataset to 218 firms.

To ensure we had up-to-date and correct information, we cross-checked the 218 firms against the Securities and Exchange Commission's (SEC) EDGAR database. We eliminated 14 firms whose stock ticker symbol could not be validated in EDGAR. We further cross-checked our dataset for retail firms associated with standard industrial classification codes (SIC) between the range of 5200-5999. The SIC code that appears in a company's EDGAR filing indicates a firm's type of business; codes between 5200-5999 stand for the retail trade industry. An additional seventy-two firms were eliminated for having SIC codes outside of this range.

Finally, we applied three data filters:

1. We selected only those firms that adopted ASC 842 at the start of their fiscal year 2019 because ASC 842 was effective January 2019. This allowed us to create three scenarios to assess borrower characteristics and associated financing costs surrounding the 2019 adoption of ASC 842. We decided the adoption year by reviewing company annual reports for language related to ASC 842. For example, we kept American Eagle Outfitters, Inc. in our sample based on this language in the company's 2019 annual report: "The Company adopted ASC 842, *Leases* as of February 3, 2019, under the modified retrospective approach and has not revised comparative periods" (American Eagle Outfitters, 2020, p.21)[1].
2. We required each firm to have 15 years of historical financial data; this length of time was necessary to ensure the correct computation of cash flow volatility, an explanatory variable.
3. We stipulated that no firm could have incomplete or missing data during the period.

Based on these filters, our final sample consisted of 71 retail firms. All firms within the final sample adopted the new lease standard at the beginning of their fiscal year 2019, allowing common comparisons. Table 1 (Appendix) supplies a profile of our sample by SIC group. Apparel and Accessory stores are the largest sector (31%), followed by Miscellaneous Retail (20%); the smallest sector represented in our sample is Building Material and Garden Supplies (2%).

Variables

Our variable of interest, Cost of Debt, is derived by following Eriksson and Thran (2019); we use publicly available 10-K financial statements and divide interest expense by long-term debt for each sampled firm. In situations where a retail firm did not have debt, the cost of debt is set to zero.

Following Bradley and Roberts (2015), our six explanatory variables, collectively representing credit risk, include book leverage, market capitalization, market-to-book, PPE to assets, EBITDA to assets, and cash flow volatility. All values used to calculate the borrower characteristics were electronically pulled from Mergent Online™ by FTSE Russell and downloaded directly into a spreadsheet. Book Leverage is determined by combining the current and long-term portions of long-term debt with reported capitalized operating lease liabilities and scaling the resulting value by total assets. We incorporated capitalized operating lease liabilities

[1] American Eagle Outfitter's 2019 fiscal year started February 3, 2019.

only for those fiscal years that occur after the ASC 842 implementation date of January 2019. Market Capitalization is calculated by multiplying a firm's fiscal year end closing stock price by its year-end outstanding shares. Daily share prices were manually matched to the fiscal year-end date for each firm for all years within the period under study. Market-to-Book is determined as the ratio of total assets minus total book equity plus market equity to total assets. PPE to Assets is the ratio of net property, plant, and equipment to total assets. EBITDA to Assets is the ratio of net operating income to total assets. Finally, Cash Flow Volatility is computed as the standard deviation of the EBITDA to Assets variable using 10 years of historical data.

Because each explanatory variable other than Market Capitalization is computed as a ratio, we could control for firm size (Lev and Sunder, 1979). All total asset figures for fiscal years 2019 and following include the effect of operating lease capitalization. Data-processing (administrative) errors were controlled by re-checking, entry-by-entry, the computed values to ensure accuracy and consistency in calculation across our panel data.

Research Design

To investigate the effect of operating lease capitalization on borrower costs, we take advantage of the change in lease accounting standards arising from *ASC 842 - Leases* by creating three scenarios:

1. We calculate 2-year averages for all variables post ASC 842 adoption by firm. The 2-year values average fiscal years 2019 and 2020. A 2-year average mitigates adoption year affects and improves generalizability.
2. We compute 2-year averages for all variables prior to ASC 842 adoption by firm. The 2-year values average fiscal years 2017 and 2018.
3. We tally 5-year averages for all variables prior to ASC 842 adoption by firm. The 5-year values average fiscal years 2014-2018. Determining 5-year averages allow us to control for the possibility that lenders changed credit assessments well in advance of the expected 2019 effective date since FASB issued Accounting Standards Update (ASU) *No. 2016-02, Leases* in February 2016 (AICPA, n.d.) and talks of revisions to the prior standard had been ongoing since 2006 (FASB, n.d.). More so, 5-year averages allow us to control for unobservable firm characteristics and time-varying economic, industry or firm related cycles.

Like other studies which looked at changes in accounting standards (see e.g., Barthelme et al., 2019; Bryce et al., 2015; Schaberl & Victoravich, 2015), we created a pre-post study design with the adoption of ASC 842 as the intervening event to measure group outcomes before and after an event; any changes between the outcomes may be partially attributed to the event. Our research design yields two pre-ASC observations and one post-ASC observation per firm; with this design, each firm acts as its own control (Schaberl & Victoravich, 2015). The research design allowed us to use up to 213 observations for our univariate and multivariate tests.

RESULTS

Our analysis begins by evaluating the descriptive statistics associated with the independent variables used to model variations in firm cost of debt in our study. We begin with a comparison of the means of the 213 observations taken from 71 firms using one-sample T-tests. Means for each independent and dependent variable displayed differences that were statistically

significant as shown in Table 2 (Appendix). However, when the data is modeled using an ANOVA comparing variables between the 2-year post-adoption scenario, 2-year pre-adoption scenario and 5-year pre-adoption scenario, respectively, only the independent variables Book Leverage, PPE to Total Assets, and EBITDA to Total Assets are significant with p-values less than .01 (Table 3 – Appendix). The results suggest that these three borrower characteristics have the greatest influence on variations in a firm's cost of debt post ASC 842. While the dependent variable did not show significance, mean effective interest rates in the 2-year post-adoption scenario increased 30 basis and 10 basis points, respectively, over the 2-year pre-adoption and 5-year pre-adoption scenarios.

Empirical Findings

The study employs two primary statistical methods to evaluate the relationship between fluctuations in firm cost of debt and the implementation of ASC 842, including logistic regression and multiple discriminant analysis (MDA). Both methods are chosen since they are well-suited for analysis of the binary independent variables of group membership of 2-year post-adoption, 2-year pre-adoption, and 5-year pre-adoption. SPSS software allows for analysis using both methods.

We begin by modeling our data using MDA to evaluate the relationship between cost of debt (Cost of Debt) and various firm characteristics, including leverage (Book Leverage), firm size (Market Capitalization), future growth opportunity (Market-to-Book), asset fixity (PPE to Assets), profitability (EBITDA to Assets), and cash management (Cash Flow Volatility). The data is separated into two sets of analysis:

1. An adoption vs. 2-year model (or, 2-year model) which compares values between the 2-year post-adoption scenario and the 2-year pre-adoption scenario, and
2. An adoption vs. 5-year model (or, 5-year model) which compares values between the 2-year post-adoption scenario and the 5-year pre-adoption scenario.

Each analytic set consists of 142 observations, i.e., 71 observations in the 2-year post-adoption scenario are compared to 71 observations from the 2-year pre-adoption scenario under the 2-year model and 71 observations in the 2-year post-adoption scenario are compared to 71 observations in the 5-year pre-adoption scenario under the 5-year model.

We first evaluate how well the overall MDA models fit the data by considering the Wilks' lambda and Eigenvalue test statistic (Table 4 Appendix). Wilks' lambda tests whether the discriminant scores between group membership for 2-year post-adoption and 2-year pre-adoption and 5-year pre-adoption, respectively, have little distinguishing power (Norusis, 2005). The Wilks' lambda goodness-of-fit for the comparison to the 2-year model is (7, N=142) = .634 and the 5-year model is (7, N=142) = .611. Both models have distinguishing power between groups as evidenced by the significance with p-values of less than .01 indicating unequal discriminant scores and that the differences between time periods have predictive power. The Eigenvalue test produced values in both 2-year and 5-year models of .578 and .637, respectively which were significantly greater than 0, also suggesting model fit. The test "represents the ratio of the between-group sum-of-squares to the within-group sum-of-squares. The higher the ratio is from zero, the better the overall model fit" (Kaufinger & Neuenschwander, 2021, p.12).

Next, we evaluate each model's explanatory power as measured by the canonical correlation. We can establish the percentage of variation in the model by taking the square of the canonical correlation (CC), which is like the R^2 found in the linear regression model. Both

models had explanatory power as shown in Table 4 (Appendix) with the 2-year model of CC^2=36.6% and the 5-year model of CC^2= 38.9%. The Structure Matrix found in Table 5 (Appendix) indicated that the independent variables of Book Leverage, PPE to Assets, and EBITDA to Assets were significant for both models with values greater than .30. Burns and Burns (2008) suggest that matrix scores above .30 can be viewed as important predictor variables.

The Standardized Canonical Coefficients for the 2-year model in Table 6 (Appendix) show that PPE to Assets and EBITDA to Assets are negatively associated with Cost of Debt, while all other variables (Book Leverage, Market Capitalization, Market-to-Book, and Cash Flow Volatility) are positively associated with Cost of Debt. If the coefficients decide group membership, we anticipate that firms with a high degree of PPE to total assets and greater earnings relative to total assets experience lower borrowing costs. Conversely, firms with a high degree of leverage, Market Capitalization and cash flow volatility would expect to experience higher borrowing costs. The 5-year model provides comparable results except for Cash Flow Volatility which is also negatively associated with Cost of Debt.

Finally, we evaluate the MDA Classification Matrix results in Table 7 (Appendix) which show the model's overall ability to predict group membership. The model provides a strong overall correct classification percentages for both 2-year and 5-year models with correct classification percentages of 81.0% and 81.7%, respectively.

We further our study by modeling our data using logistic regression with a comparison of the 2-year post-adoption scenario with both the 2-year pre-adoption and 5-year pre-adoption scenarios consisting of 142 observations for each regression. We begin by evaluating the overall model fit of the data. The results for both models confirmed that data fits as indicated by the insignificance of the Hosmer and Lemeshow test for both the 2-year and 5-year models at the .01 level with p-values of .253 and .029, respectively. The explanatory power as measured by both the Cox & Snell R^2 and Nagelkerke R^2 in Table 8 (Appendix) provide evidence that both models explain a significant part of the variance between the two groups. The 2-year model indicated that the Cox & Snell R^2 and Nagelkerke R^2 was .359 and .479, respectively. The 5-year model produced R^2 values of 0.384 and 0.512, respectively.

When we evaluate the coefficient signs for the independent variables in Table 9 (Appendix), we see that PPE to Assets and EBITDA to Assets are both negatively correlated to Cost of Debt for both the 2-year and 5-year models which was consistent with coefficient behavior found in the MDA model. The only exception was the negative correlation of the Cash Flow Volatility in the 5-year model. Firms with a high degree of PPE to total assets and greater earnings relative to total assets experience lower borrowing costs while firms with a high degree of leverage and cash flow volatility would expect to experience higher borrowing costs. In Table 10 (Appendix) we see that Book Leverage, PPE to Assets, and EBITDA to Assets are significant at the .01 level for both the 2-year and 5-year models which is consistent with the results from MDA analysis. Finally, the classification matrices in Table 11 (Appendix) for both models, respectively, indicate that models correctly classify the observations with accuracy 81% and 81.7% for the 2-year and 5-year models, respectively.

Considering the results of our descriptive statistics, *t*-tests, ANOVA, and our primary statistics, MDA and logistic regression, we are able to reject our null hypothesis that *that there is no difference in credit risk as reflected in the cost of debt between the former lease accounting standard and the updated lease accounting standard in the retail sector*. However, the

independent variable, Cost of Debt, was found to be insignificant between groups in the ANOVA, MDA, and logistic regression models.

DISCUSSION

Our study results are closer to Altamuro et al. (2014) who found that there seems to be a relationship between operating leases that are capitalized and bank loan spreads. This association held true except for retail firms. Retail leases are less germane in credit risk evaluation (Altamuro et al., 2014). If our findings supported the notion that reporting both assets and liabilities associated with retail leases are relevant to credit risk, we would expect to see the cost of debt significantly increase and decrease based on changes in borrower characteristics when comparing the periods both before and after the implementation of ASC 842. The increase in transparency resulting from requiring both the leased asset and liability to be reflected in the balance sheet should result in degradation of financial ratios and in turn increase borrower costs reflecting the increased borrower risk. However, the borrower risk and related cost reflected in the dependent variable, Cost of Debt, does not change significantly when comparing both time periods. Our research models explained a significant percentage of the fluctuation in cost of debt as indicated by the MDA canonical correlation with the 2-year model of CC^2=36.6% and the 5-year model of CC^2= 38.9% and the logistic regression Nagelkerke R^2 of 47.9% for the 2-year model and 38.4% for the 5-year model, but the coefficient for Cost of Debt did not demonstrate any significance when using ANOVA, MDA, or logistic regression. The results suggest that the increased transparency and/or decreased information asymmetry presupposed by the implementation of ASC 842 did not reveal greater borrower risk.

We believe that at least three interpretations exist to explain why the implementation of ASC 842 requiring operating lease capitalization did not result in increased (decreased) borrower risk and higher (lower) related borrowing cost. First, we believe that retail leases may be less relevant in credit risk assessment decisions than assumed. Perhaps credit quality analysis by lenders places greater emphasis on profit margins and free-cash-flows which would be less impacted by increases in fixed assets or long-term liabilities. Second, the capitalization of operating leases may have been already factored into creditors' lending decisions prior to ASC 842. Lenders have widely understood that retail firms commonly use lease contracts for the acquisition of retail spaces given the flexibility to scale based on consumer demand and macro-economic factors and have found other means of assessing the impact on borrower risk. Finally, firms may have delayed the entry into new lease contracts or delayed new debt acquisition during the study period due to the economic uncertainty brought on by COVID-19. Despite this, we did find that retail firms appear to experience a greater degree of leverage post ASC 842 adoption while profitability and lower non-lease, fixed assets declined. Specific to leverage, we expected the requirement of including the asset and liability on the balance sheet to naturally result in increased leverage ratios from pre-ASC 842 reporting periods. The same can be said for the degradation of the profitability and asset fixity factors.

Like an earlier study by Kaufinger & Neuenschwander (2021) we also controlled for market capitalization by firm in our sample. Our supposition was and continues to be that a retail firm's ability to broker more favorable lease terms related to pricing is size dependent. Since lease costs, including interest and amortization costs, should be lower for larger retailers who have greater economies of scale, we can expect a decrease in the percentage change of borrower costs. Contrary to Kaufinger & Neuenschwander (2021), we found a positive correlation between

the market capitalization variable and the percentage change in borrower cost; in short, this variable had predictive ability.

STUDY LIMITATIONS AND FUTURE RESEARCH

Our study found a rise in the cost of debt based upon differences between the previous and current leasing standard using borrower characteristics from debt covenant literature. However, several factors limited our results. First, each model's sample size (n = 142) is not sizeable to provide precise estimates of the strength of the relationship. Second, the results are explicit to firms in the retail industry. Third, we did not include external market factors that affect interest rates in general such as Gross Domestic Product (GDP) or inflation. Finally, we did not control for other lending tools beyond the cost of debt that protect against or mitigate the probability of loan such as compensating balances or assets pledged as collateral. While these tools allow lenders to offer lower loan rates, they do represent an increase in borrower risk that would not be captured in borrower cost.

There are additional opportunities to extend our research further. First, the study could be expanded to include other industries that use leases extensively such as the airline industry to control for other factors affecting borrower costs such as types of collateral or length of loans that are unique to that industry. In addition, the inclusion of other industries would control for economic factors unique to specific industries such as current consumer demand or profit margins. Second, a benchmark interest rate could be added to the model to find how much of the change in cost of debt is related to overall market factors like GDP or inflation rather than fluctuations in financial ratios.

SUMMARY

Leases are used extensively in the retail industry to exploit the flexibility found in right-of-use assets versus outright ownership, as well as to advance favorable financing terms associated with those same assets. Because of this, retail firms must comprehend how the adoption of ASC 842 affects their credit worthiness and related cost of financing. This study adds to the literature by considering the relationship between the change from the previous lease standard to the current lease standard, and the related impact on borrower risk. Earlier studies that assessed leasing standard changes primarily concentrated on comparisons of financial statement results by capitalizing operating assets as capital leases for inclusion on the balance sheet. Our study is different in that it focuses on borrower risk as measured by the increase in borrowing costs. Based upon our results, we concluded that mean borrower cost, which reflects the merchant's credit worthiness, increased in the periods following the adoption of ASC 842 by as much as 30 basis points. We also found that firms displayed a greater degree of balance sheet leverage offset by lower non-lease asset fixity and lower earnings. However, the incremental change in the cost of debt was not significant. We believe there are several reasons for our results. First, retail leases may be less relevant in credit risk assessment decisions than previously thought. Second, operating lease capitalizations may have been factored into creditors' lending models prior to ASC 842 implementation, and third, firms may have delayed acquiring new debt during the study period due to external market and pandemic-related factors.

In summary, our research found that a firm's creditworthiness or cost of debt was affected by the adoption of ASC 842. The impact was associated with increased leverage offset

by lower fixed assets and earnings. However, the change in the cost to the borrower was not significant. Further analysis is needed to evaluate ASC 842's impact on borrowing costs.

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APPENDIX

Table 1: Merchant Profile by Standard Industrial Classification

	N	Percent
Building Materials and Garden Supplies	2	3%
General Merchandise Stores	12	17%
Automotive Dealers and Service Stations	13	18%
Apparel and Accessory Stores	22	31%
Furniture and Home Furnishings	8	11%
Miscellaneous Retail	14	20%
Total	71	100%

Table 2: One-Sample T-tests

	t-stat	p-value
Group Membership	17.833	0.001 *
Cost of Debt	9.754	0.001 *
Book Leverage	16.544	0.001 *
Market Capitalization	4.239	0.001 *
Market-to-Book	7.982	0.001 *
PPE to Assets	29.032	0.001 *
EBITDA To Assets	11.606	0.001 *
Cash Flow Volatility	23.215	0.001 *

** $p < .05$*

Variable Definitions:

Cost of Debt - interest expense divided by long-term debt
Book Leverage - a measure of long-term debt
Market Capitalization - a measure of firm size
Market-to-Book - a measure of future growth opportunity
PPE to Assets - a measure of asset fixity, assessing productive assets trapped in property, plant, and equipment
EBITDA to Assets - a measure of profitability
Cash Flow Volatility - a measure of cash management

Table 3: Model ANOVA

	F-Stat	Significance
Cost of Debt	0.012	0.988
2-years post adoption, *M* = 6.0%		
2-years pre-adoption, *M* = 5.7%		
5-years pre-adoption, *M* = 5.9%		
Book Leverage	27.178	0.001 *
Market Capitalization	0.118	0.889
Market-to-Book	0.049	0.952
PPE To Asset	11.065	0.001 *
EBITDA to Assets	6.685	0.002 *
Cash Flow Volatility	0.363	0.696

** p < .05*

Table 4: MDA Goodness-of-Fit Tests

MDA: Wilks' Lambda

	Adoption vs. 2-year			Adoption vs. 5-year		
Function	***Wilks Lambda***	***Eigenvalue***	***P Value***	***Wilks Lambda***	***Eigenvalue***	***P Value***
Group Membership	0.634	0.578	.000*	0.611	0.637	.001*

** p < .05*

MDA: Eigenvalues

	Adoption vs. 2-year			Adoption vs. 5-year		
Function	***Eigenvalue***	***Canonical Correlation***	***Canonical Correlation²***	***Eigenvalue***	***Canonical Correlation***	***Canonical Correlation²***
Group Membership	0.578	0.605	36.60%	.637	.624	38.9%

Table 5: MDA: Structure Matrix

Predicted Group	Adoption vs. 2-year	Adoption vs. 5-year
Book Leverage*	0.6970	0.6920
PPE to Assets*	-0.4670	-0.4480
EBITDA to Assets*	-0.2810	-0.3820
Cash Flow Volatility	0.0750	-0.0070
Market Capitalization	0.0540	0.0240
Market-to-Book	0.0320	0.0210
Cost of Debt	0.0160	0.0060

** Coefficients greater than .30 are significant*

Table 6: MDA: Standardized Canonical Coefficients

Predicted Group	Adoption vs. 2-year	Adoption vs. 5-year
Cost of Debt*	0.1280	0.0920
Book Leverage	0.8310	0.8050
Market Capitalization*	0.1220	0.0750
Market-to-Book*	0.2620	0.2450
PPE to Assets	-0.6570	-0.5840
EBITDA to Assets	-0.3410	-0.4540
Cash Flow Volatility*	0.0190	-0.0840

** Variable was not significant*

Table 7: Classification matrix – Predicted Group Membership

Predicted Group	**Adoption**	**2-year**	**Total**
Adoption	56	15	71
2-Year	12	59	71
Percent Correct			
Adoption	78.9%	21.1%	100%
2-Year	16.9%	83.1%	100%
Overall Correct Classification	***81.0%***		

Predicted Group	**Adoption**	**5-year**	**Total**
Adoption	56	15	71
5-Year	11	60	71
Percent Correct			
Adoption	78.9%	21.1%	100%
5-Year	15.5%	84.5%	100%
Overall Correct Classification	***81.7%***		

Table 8: Logistic Regression: Goodness-of-Fit Tests

Model Summary

	Adoption vs. 2-year			**Adoption vs. 5-year**		
Function	***-2 Log likelihood***	***Cox & Snell R^2***	***Nagelkerke R^2***	***-2 Log likelihood***	***Cox & Snell R^2***	***Nagelkerke R^2***
Group Membership	133.714	0.359	.479	128.049	0.384	0.512

Table 9: Logistic Regression: Coefficients

Predicted Group	Adoption vs. 2-year	Adoption vs. 5-year
Cost of Debt	-2.291	-2.3730
Book Leverage	-6.819	-7.1540
Market Capitalization	0.0000	0.0000
Market-to-Book	-0.0800	-0.0800
PPE to Assets	7.4530	7.0180
EBITDA to Assets	4.9450	7.7170
Cash Flow Volatility	-.9670	3.6030

Table 10: Logistic: Significance

Predicted Group	Adoption vs. 2-year	Adoption vs. 5-year
Cost of Debt	0.348	0.353
Book Leverage*	0.001*	0.001*
Market Capitalization	0.441	0.634
Market-to-Book	0.110	0.137
PPE to Assets*	0.001*	0.001*
EBITDA to Assets*	0.023*	0.003*
Cash Flow Volatility	0.871	0.562

** $p < .05$*

Table 11: Classification matrix – Predicted Group Membership

Predicted Group	Adoption	2-year	Percent Correct
Adoption	56	15	78.9%
2-Year	12	59	83.1%
Overall Correct Classification	***81.0%***		

	Adoption	5-year	
Adoption	57	14	80.3%
5-Year	12	59	83.1%
Overall Correct Classification	***81.7%***		