Does the new lease standard, Topic 842, reveal an increased risk of bankruptcy for retailers? An ex ante analysis.

Gregory G. Kaufinger
Kutztown University of Pennsylvania

Chris Neuenschwander
Anderson University (SC)

ABSTRACT

This paper examines whether the adoption of *ASU 2016-02, Leases (Topic 842)* will reveal an increased risk of bankruptcy for retailers traditionally operating in indoor shopping malls. This study employs a multiple discriminant analysis model based on Altman Z"-scores to compare zones of discrimination for 40 merchants over a ten-year period. The study compares two scenarios, including an off-balance sheet scenario based on as-reported, annual (10-K) results without lease capitalization, and an on-balance sheet scenario using transformed results based on the factors method. The results clarify the implication of moving off-balance sheet financing onto the balance sheet for some retailers. *Topic 842* adoption reveals increased financial risk and an observable shift towards greater bankruptcy risk post lease capitalization. This study provides evidence that the financial position of indoor, mall-based retailers could be weaker than conventional wisdom suggests, thereby elevating the importance of good retail management during the retail apocalypse era. This study is the first to look at whether a new US lease standard illuminates the risk of bankruptcy. Unlike other literature, this research uses retail firms that are disproportionately affected by the retail apocalypse and employs a heuristic model to assess the impact of lease capitalization.

Keywords: ASU 2016-02, Leases, Topic 842, Bankruptcy Risk, Factor Method, Lease Capitalization, Altman Z"

INTRODUCTION

Several *ex ante* multi-sector studies (see e.g., Durocher, 2008; Jesswein, 2009; Grossman and Grossman, 2010; Fito *et al.*, 2013) have found significant effects on lessee financial ratios from capitalizing leases. To a lesser degree, this phenomenon has been researched on specific industries, but the findings are generally consistent. Lease capitalization, which is the process of moving off-balance sheet lease obligations onto the balance sheet, creates less favorable leverage, coverage and asset-related ratios which suggests greater financial risks. The resultant financial ratios could also be associated with increased bankruptcy risk, vis-à-vis distressed firms utilizing leasing to a greater extent than non-distressed firms (Altman, 1976). However, a review of the literature to date suggests researchers have not investigated bankruptcy risks for industries that are highly reliant on fixed lease commitments under the new U.S. leasing standard, *ASU 2016-02, Leases - Topic 842* (or, "new standard"). This study examines whether the adoption of the new standard by certain U.S. publicly-traded merchants (or, the lessees) will reveal increased financial risk, and therefore, reveal an increased risk of bankruptcy.

As a proxy for bankruptcy risk, we use zones of discrimination based on the Altman Z"-score. Predictor variables are also taken from Altman's modified Z"-score model. The modified Altman Z"-score is used extensively for non-manufacturing firms (Eidleman, 1995). The study compares two scenarios, including an off-balance sheet scenario based on as-reported results without lease capitalization, and an on-balance sheet scenario using transformed results based on the factors method, with both lease-asset and lease-debt equivalents for operating leases added to the balance sheet. The study employs descriptive statistics, ANOVA, and discriminant analysis to evaluate whether Topic 842 provides increased transparency regarding bankruptcy risk. We specifically investigate merchants that have traditionally been found in indoor shopping malls, such as JCPenney, Macy's Inc., Stein Mart Inc. and L Brands Inc. We employ an *ex ante* analysis because retail firms did not adopt the finalized standard until fiscal year 2019; when the entities reported their results (i.e., in calendar year 2020), they used a modified retrospective approach, applying the new standard only to their most current fiscal period (i.e., fiscal year 2019), *without adjusting financial values in the prior reported periods*. (At the time of this writing, fiscal year 2020 results are not available.) With an *ex ante* method, we are able to assume that merchants used the full retrospective approach, *adjusting all prior period financial values* throughout the study's time period; we believe this approach ensures comparability because all values are presented on the same basis.

The motivation of this study stems from the "retail apocalypse" in the U.S. The expression retail apocalypse is used to describe both the bankruptcy of many traditional brick-n-mortar merchants and the catastrophic closing of a large number of physical retail stores (Helm *et al.*, 2018; Shively, 2019). The study aims to understand whether merchants' financial statements will better represent financial risk once merchants have fully incorporated Topic 842's requirements. If there is significant difference in financial ratios between the off-balance sheet and on-balance sheet scenarios, this would be an indication that these aims have been achieved. Another purpose of the study is to provide empirical evidence as to whether Topic 842 achieves its purpose of providing users the necessary information to understand the impact of a retailer's leasing activities, relative to bankruptcy. If there is significant movement between the zones of discrimination, this would suggest that the new standard is clarifying the true bankruptcy risk, post capitalization. A final purpose of the study is to empirically validate

whether a convenient capitalization method, known as the factor method, can be used in future empirical research to determine the effects of lease capitalization.

Our study differs from other studies in several ways. First, to our knowledge, no study to date has examined whether the new standard illuminates the risk of bankruptcy. Second, sub-sector analysis (i.e., focusing on specific subdivisions within an industry) in general is uncommon; our use of publicly-traded merchants that are typically found in indoor shopping malls is unique. Third, our study employs an expedient method to capitalize leases and achieves similar results to research using a more complicated method known as constructive capitalization (e.g., Beattie *et al.*, 1998, Durocher, 2008). And finally, unlike other research that assessed the impact of Topic 842 based on exposure drafts, our study is developed after the final version of Topic 842 was issued.

The results of this study confirm our expectations. Topic 842 appears to reveal increased financial risk post lease capitalization; three of the four predictor variables measuring net working capital relative to capitalization, cumulative profitability, and asset productivity, respectively, indicated a decline in financial performance. In addition, financial ratios and zones of discrimination derived from the on-balance sheet scenario appear to be reveal greater financial distress relative to financial ratios and zones of discrimination derived from the off-balance sheet scenario. There was a significant, observable shift in bankruptcy risk due to lease capitalization. Finally, the results demonstrated that the factor method for lease capitalization produces similar findings to a more complex capitalization model called constructive capitalization; this result suggests that a heuristic model could be used to assess the impact of lease capitalization.

This study contributes to the literature by clarifying the implication of moving off-balance sheet financing onto the balance sheet under the new standard for certain retailers, specifically those merchants which typically operate in indoor shopping malls. In addition, this study increases our understanding of how lease capitalization in general fosters transparency in both financial performance and bankruptcy risk. Lastly, and specifically, our study provides evidence that the financial position of retailers could be weaker than conventional wisdom suggests, thereby elevating the importance of good retail management during the retail apocalypse.

The remainder of this paper is organized as follows. The next section provides a brief overview of lease accounting. Following that, we review the relevant literature. After developing our hypothesis, we describe the methodology and data collection process. Finally, after discussing the empirical results, we note limitations, and suggest opportunities for future research.

BACKGROUND: LEASE ACCOUNTING

Prior to Topic 842, lessees accounted for leases in one of two ways, either as an operating lease or a capital lease. Essentially, in order to qualify for the more favorable operating lease designation, firms had to avoid meeting four lease criteria, or bright-line rules; otherwise, the lease was designated a capital lease. Attempts to avoid the capital lease treatment criteria created an environment known as lease-structuring (Grossman and Grossman, 2010), whereby firms intentionally designed lease agreements to avoid the capital lease label. The benefits of structuring leases as operating leases meant that the lease agreement was kept off the balance sheet, only rent expense was recorded over the lease term, and the lessee simply had to disclose the arrangement in a note to the financial statements. However, lease-structuring was viewed

negatively, such that the Securities and Exchange Commission (SEC) (2003) shamed the practice by publicly stating that "lease structuring to meet various accounting, tax, and other goals, has become an industry unto itself in the last 30 years (p.63)."

With Topic 842, fundamentally all leases are now considered financial (capital) leases as operating leases are essentially eliminated within the new standard; basically, this change means that the majority of leases will be included in the balance sheet because the preponderance of leases will meet at least one of the five finance lease classification criteria included in the new standard. From an accounting standpoint, the lessee is required to recognize a right-of-use asset and a corresponding lease liability. In addition, lessees will recognize lease interest expenses and amortize the right-of-use asset consistent with their usual policy for depreciating operational assets (e.g., straight-line). The Financial Accounting Standards Board (FASB) believed that this new guidance would result in fewer opportunities to structure lease transactions, enhance lease disclosure, and improve investor's understanding and comparability of lessees' financial commitments (FASB, n.d.). The new standard is effective for publicly-traded businesses in fiscal periods that begin after December 15, 2018[1].

LITERATURE REVIEW

This section explores the research related to lease capitalization and financial ratios, the use of financial ratios to assess bankruptcy risk, the relationship between lease capitalization and bankruptcy risk, and finally, common methodologies that are used to convert operating (off-balance sheet) leases to financial (on-balance sheet) leases. This section also introduces our research questions and associated hypotheses.

Lease Capitalization and Financial Ratios

Several previous studies have examined the association between various financial ratios (e.g., return on asset, leverage, or times interest earned) and lease capitalization for lessees. Research using data from multiple U.S. sectors finds evidence supporting less favorable debt and asset ratios after capitalization (e.g., Mulford and Gram, 2007; Grossman and Grossman, 2010; Lee *et al*., 2014). The majority of these studies assessed the impact of proposed lease accounting changes using various iterations of US leasing standards, often with *ex ante* research methods.

Research on specific sectors that are highly reliant on fixed lease commitments, such as airlines or retail is less common, but the findings are generally consistent with the multi-sector research (see e.g., Caster *et al*., 2018). In the retail sphere specifically, Mulford and Gram (2007), Singh (2012), and Fafatas and Fischer (2016) find evidence that capitalization significantly alters financial ratios. Mulford and Gram (2007) find that off-balance sheet leases caused a material distortion of the financial position of 19 large retail firms. After adjusting for capitalization, the authors find significant increases in financial leverage, and reductions in debt coverage and profitability ratios. Similarly, Singh (2012) finds that retail firms would be significantly affected by operating lease capitalization on 11 widely used ratios, including decreased interest coverage and increased leverage, and that medium-sized merchants would see greater changes in financial ratios from lease capitalization. Fafatas and Fischer (2016) find that the average decrease in an Earnings Before Interest and Taxes (EBIT) to Assets ratio among 22

---

[1] For a more detailed review of lease accounting under Topic 842, see Holzmann & Munter, 2016; Porter, 2016; Newhard, 2017; Sliwoski, 2017; Casabona & Coville, 2018; and Rossi III, 2018.

merchants is 557 basis points. Only Singh (2012) and Fafatas and Fischer (2016) considered the implications on financial ratios from the new standard, Topic 842; yet, in both instances, the authors used exposure drafts to evaluate any potential impact.

U.S. research findings are supported by international efforts to understand the *ex-ante* financial effect of International Financial Reporting Standard (IFRS) 16, which is the international counterpart to Topic 842. In Spain, Zamora-Ramirez and Morales-Díaz (2018) find increases in leverage with decreases in interest coverage ratios, especially in more lease-intensive sectors such as retail and hotels. In a similar study using 646 European firms, Morales-Díaz and Zamora-Ramirez (2018) find that the adoption of IFRS 16 will have a significant impact on balance sheet, leverage and solvency ratios. In New Zealand, Bennett and Bradbury find that capitalization has a material impact on reported liabilities and financial ratios. Likewise, in Canada, Durocher (2008) suggests that lease capitalization would increase assets and liabilities, and significantly increase the debt-to-asset ratio and decrease the current ratio. Similar results are found by Nuryani *et al*. (2015), and Maglio *et al*. (2018) in other parts of the world. As in the US, single sector studies are rare, but the research provides comparable findings (see e.g., Veverková, 2019).

Financial Ratios and Bankruptcy Risk

Bankruptcy risk is related to business failure (Alaka, 2016). There is a long history of research that has examined bankruptcy (Sun *et al*., 2014); the "modern era" of study in this area began with the seminal works of Beaver (1966) and Altman (1968). Beaver was the first to affirm that financial ratios had predictive ability; his most important contribution was probably a methodology for evaluating accounting data for any purpose. In fact, as it relates to the present study at hand, he presciently observed:

> The financial-lease controversy could be subjected to tests similar to the ones used [in this study]. The efficacy of capitalizing financial leases could be evaluated by computing two sets of financial ratios. One set would include the capitalized value of leases as debt, while the other set would not. (Beaver, 1966, pp. 99-100)

Since Beaver, the preponderance of bankruptcy research has used financial ratios as independent variables, *ex post*, because signs of bankruptcy are evident in ratios before a firm actually fails (Bhargava *et al*., 1998).

Altman (1968) is credited with using multiple discriminant analysis to assess corporate bankruptcy prediction. His work is also widely regarded for its discriminant function, or Z-score model, which proved effective at classifying distressed versus non-distressed enterprises. Today, Altman's Z-Score (and its variations) continues to be used worldwide as a primary or secondary tool for bankruptcy or prediction and analysis (Altman *et al*., 2017).

The number of financial ratios that have been used in bankruptcy studies almost seems limitless. Du Jardin (2009) actually tallied the number of ratios that have been used to build bankruptcy prediction models over a 40-year time period; he estimates over 500. We did not attempt to confirm his estimate. However, the most common ratios convey issues regarding profitability, liquidity, leverage, coverage, or cash flow.

Generally speaking, bankruptcy literature uses mixed-sector samples (McGurr and DeVaney, 1998). However, mixed sample models suffer from an overstatement of model classification accuracy; this is likely due to the fact that mixed samples do not acknowledge that dissimilar industries confront different levels of competition, and the possibility of failure can

differ significantly within each industry (Kim and Upneja, 2014). It's no wonder then that Sun *et al*. (2014) call for models based on single industry sampling.

Published works which specifically examine retail bankruptcy are infrequent. Bhargava *et al*. (1998) and McGurr and DeVaney (1998) focused on establishing macro-level retail bankruptcy prediction models, with mixed results. Bhargava *et al*. find that existing bankruptcy models developed for other industries could be applied to retail. In contrast, the classification accuracy of five existing bankruptcy prediction models employed by McGurr and DeVaney declined significantly when applied only to retail. Two more recent studies using retail sub sectors also had mixed findings. Youn and Gu (2010) find no significant difference in two different model's ability to predict bankruptcy for publicly-traded restaurants, while a model developed by Kingyens *et al*. (2016) finds greater predictive power for publicly-traded retail apparel firms when controlling for managerial, market, and economic factors.

Lease Capitalization and Bankruptcy Risk

Prior research has considered the association between lessee lease capitalization and corporate failure prediction models, albeit with mixed results. On one hand, Elam (1975) was the first to find that adding capitalized leases to the balance sheet did not increase his model's power for predicting firm bankruptcy. His results are confirmed by Lawrence and Bear (1986), who also conclude that lease capitalization did not improve the *ex post* classification accuracy of bankruptcy models. More recently, Lückerath-Rovers (2009) finds that while financially distressed companies used operating leases to a greater degree than non-distressed companies, the accuracy of bankruptcy prediction models did not improve post capitalization.

On the other hand, Deakins (1972) finds that bankrupt firms expand debt rapidly prior to failure; as noted by Altman (1976), it is likely that some of this expansion is correspondingly funded with off-balance sheet financing. Empirically, Altman *et al*. (1977) created a second-generation bankruptcy classification model which included adjustments for capitalized noncancelable operating and finance leases, and the addition of the retail sector. The revised model was found to be more accurate than the original Z-score model, especially 2 – 5 years prior to the distress date (Altman, 2013). Likewise, Bhargava *et al*. (1998) find that controlling for the tendency of retailers to lease rather than own, their bankruptcy models predict successfully. Despite these mixed findings, one thing is clear: prior research considerably pre-dates the new leasing guidance found in Topic 842.

Capitalization Methods

There are two methods that are generally used to capitalize off-balance sheet leases. The first is a discounted cash flow technique and is commonly called the constructive method in the literature (Imhoff *et al*., 1991, 1997). Essentially, the method requires discounting future operating lease payments to determine lease-debt and lease-asset equivalents that are incorporated into the financial position of firms. In academic settings, it is generally considered the more robust of the two methods (Barone *et al*., 2014) and has been leveraged by Beattie *et al*. (1998), Durocher (2008), Sari *et al*. (2016), and Pardo and Giner (2018), among others.

The second method is a "rule-of-thumb" or heuristic method, and is commonly called the factor method (or, multiples method) (Henraat *et al*., 2013); the method has been used by Fülbier *et al*. (2008). This method is favored by credit agencies and financial analysts because of its

simplicity. In the case of retail, the method requires multiplying minimum rent payments (leases) by a multiplier (factor) to determine a lease-debt equivalent. Traditionally, a factor of eight times rent was used (Henraat *et al.*, 2013), but Moody's recently lowered their factor for retail to six times rent (Moody's, 2015); this change essentially decreases the lease-debt equivalent, making the new factor more conservative than in the past. In our analysis, Moody's new factor results in comparable estimates of lease liabilities to the constructive method; the results of our analysis are consistent with the heuristic-constructive capitalization comparison models of Bennett and Bradbury (2003), Fülbier *et al.* (2008), and Giner and Pardo (2017). (This additional analysis is not reported in this paper but is available from us upon request). As such, we assume that the factors method using a conservative six times factor is adequate to achieve the objectives of this study. Consistent with (Singh, 2012), we update the factor method to also consider the potential effect in assets, equity and deferred taxes.

Research Questions & Hypotheses

This study examines whether the adoption of the new standard by U.S. publicly-traded merchants (or, the lessees) will reveal increased financial risk, and therefore, reveal an increased risk of bankruptcy.

The *first research question* is whether merchants' financial statements will better represent financial risk after the entities have fully incorporated Topic 842's requirements. Comparing off-balance sheet and on-balance sheet scenarios for the treatment of leases, we hypothesize:

H_1 – *There is no significant difference in financial risk between the off-balance sheet scenario and the on-balance sheet scenario.*

Analytically, we compare financial ratios between off- and on-balance sheet scenarios. If there is significant difference in financial ratios between the off-balance sheet and on-balance sheet scenarios, this would be an indication that the risk profile has changed. Based on previous research, we expect that there will be significantly different, and less favorable ratios post capitalization.

The *second research question* is whether Topic 842 achieves its purpose of providing users the necessary information to understand the impact of a retailer's leasing activities, relative to bankruptcy. Comparing off-balance sheet and on-balance sheet scenarios for the treatment of leases, we hypothesize:

H_2 – *There is no significant difference in bankruptcy risk between the off-balance sheet scenario and the on-balance sheet scenario.*

Here, we compare movement between zones of discrimination, pre- and post-capitalization. If there is significant movement between the zones of discrimination, this would suggest that the new standard is clarifying the true bankruptcy risk post capitalization. We anticipate that significantly more retailers will be classified as having a higher risk of bankruptcy, post capitalization.

An ancillary objective of this study is to empirically validate whether the more conservative six times rent factor method can be used to assess financial and bankruptcy risk. This approach is less commonly used, so classification matrices consistent with established lease capitalization literature would suggest that the factor method is a viable alternative for future research. Our expectation is that the factor method will produce comparable classification matrices.

VARIABLES

This section discusses both the dependent and independent variables used in the study.

Dependent Variable

This study uses zones of discrimination as the dependent variable; zones of discrimination are a way to classify bankruptcy risk based on a multi-variable Altman Z-score model (Pam, 2013; Doś, 2017; Agarwal and Patni, 2019). Following prior corporate failure research that used a modified Altman Z"-score for non-manufacturing firms (Hayes *et al*., 2010; Hamid *et al*., 2016; Manaseer and Al-Oshaibat, 2018), we adopted the following zones of discrimination: Z" > 2.6 for the "Safe" Zone, 1.1 < Z" < 2. 6 for the "Grey" Zone and Z" < 1.1 for the "Distress" Zone. Generally, firms in the safe zone have low risk of bankruptcy while firms in the distress zone have higher risk of bankruptcy. The grey zone is a zone of indifference. Initially, we calculated a Z"-score by retail firm and by year for both the off-balance sheet, or as-reported scenario, and the on-balance sheet, or pro forma scenario; the pro forma scenario incorporated adjustments to capitalize leases not previously added to the balance sheet. Then, the resultant Z"-scores were transformed to the appropriate zone of discrimination.

Independent Variables

This study uses four predictor variables; the variables are drawn from the next generation Z"-score formula for non-manufacturing companies (Altman, 2013):

$$Z" = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

where, X_1 = Net Working Capital Ratio (Working capital ÷ Total Assets)

X_2 = Retained Earnings to Total Assets Ratio (Retained Earnings ÷ Total Assets)

X_3 = Earnings Before Interest & Tax to Total Assets Ratio (EBIT ÷ Total Assets)

X_4 = Book Value of Equity to Total Liabilities Ratio (Equity ÷ Total Liabilities)

This Z"-score formula is considered appropriate for retail firms (Pang and Kogel, 2013). The Net Working Capital Ratio (X_1) is a measure of the net liquid assets (current assets – current liabilities) of a firm relative to its total capitalization (Altman, 2013). The Retained Earnings to Total Assets Ratio (X_2) is an indicator of the 'cumulative profitability' of the firm (Agarwal and Patni, 2019). The EBIT to Total Assets Ratio (X_3) reflects the true productivity of a firm's assets (Batchelor, 2018). And finally, the Book Value of Equity to Total Liabilities Ratio (X_4) describes how much a firm's assets can decline in value before the firm becomes insolvent (Altman, 2013). Using ratios controls for firm size (Lev and Sunder, 1979). We calculated each ratio by retail firm for each year for both the off-balance sheet, or as-reported scenario, and the on-balance sheet, or pro forma scenario; the pro forma scenario incorporated adjustments to capitalize leases not previously added to the balance sheet.

METHODOLOGY

The purpose of this study is to extend existing literature by evaluating whether the adoption of Topic 842 by U.S. publicly-traded merchants (or, the lessees) will reveal increased bankruptcy risk. This goal is accomplished through the use of both descriptive statistics and inferential statistics, including ANOVA, 2-proportion tests, and multiple discriminant analysis

(MDA), where the latter is typically used in studies assessing bankruptcy risk (Altman *et al*., 2017). An MDA model is deemed adequate because the dependent variable (zones of discrimination) is mutually exclusive and exhaustive, the independent variables differ across groups of the dependent variable, the overall sample size is large, and the sample size per zone of discrimination is an adequate size (Hair *et al*., 2006). The criterion for statistical significance is 95%.

Two scenarios were leveraged in the study, including an off-balance sheet scenario based on as-reported, annual (10-K) results without lease capitalization, and an on-balance sheet scenario using transformed results based on the factors method, with both lease-asset and lease-debt equivalents for operating leases added to the balance sheet. The actual process we used to create the on-balance sheet scenario is described later.

The discriminant model was used to test statistical significance, to predict group membership, and to determine the predictive ability of the discriminant function (i.e., to determine the hit ratio). A zone of discrimination was calculated for each firm year under each scenario using the Altman Z"-score model for nonmanufacturers; this dependent variable was coded as a 3 if the Z"-score was greater than 2.6, a 1 if the Z"-score was less than 1.1, and a 2 if the Z"-score fell in between 1.1 and 2.6. As an example, the fiscal year 2018 Z"-score for Stein Mart Inc. under the off-balance sheet scenario was 1.97 while the Z"-score under the on-balance sheet scenario was -21.18. As such, the zones of discrimination were coded as 2 and 1, respectively.

In similar fashion, the four predictor variables, comprising the four financial ratios drawn from Z"-score formula for non-manufacturing companies, were calculated under each scenario for each firm year. All ratio calculations were completed in a spreadsheet.

Sample and Data Collection

Unlike other studies, we used publicly-traded retail firms that traditionally operate in indoor shopping malls; examples include JCPenney, Macy's Inc., Stein Mart Inc. and L Brands Inc. We elected to narrow the scope to merchants typically found in indoor shopping malls for three reasons:
1. The traditional indoor shopping mall is disproportionately affected by the retail apocalypse (Bhattarai, 2019). The assumption is that merchants operating in this sphere are already financially distressed, which makes finding a significant difference in the zones of discrimination between the off-balance sheet and on-balance sheet scenarios all the more meaningful.
2. Shopping center leases are frequently structured with a base rent component and a contingent component (Benjamin, *et al*., 1990). Base rents are considered the minimum rent payment. Stores like Macy's Inc. typically pay the lowest minimum rents in retail (Edelman and Petzold, 1996) which means their use in this study allows us to calculate conservative lease-debt equivalents relative to other large lease sectors such as restaurants and drug stores (Fafatas and Fischer, 2016). Here again, the assumption is that finding statistically significant differences in the zones of discrimination between the off-balance sheet and on-balance sheet scenarios is more convincing given the conservative adjustments to the on-balance sheet scenario.
3. To our knowledge, there is a gap in the literature relative to this retail sub-sector.

Our criteria for determining a sample population was whether a US-based retailer fell within one of seven Standard Industry Classification (SIC) codes that were judged by us as "indoor mall-centric":

1. 5311- Department Stores
2. 5611- Men's and Boys' Clothing and Accessory Stores
3. 5621- Women's Clothing Stores
4. 5641- Children's and Infants' Wear Stores
5. 5651- Family Clothing Stores
6. 5661- Shoe Stores
7. 5699- Miscellaneous Apparel and Accessory Stores

We confirmed that firms under these SIC codes, such as Express Inc. and Abercrombie & Fitch Co., mostly operate in indoor shopping centers through a 10-K review. We specifically excluded several SIC codes classified as Retail from our sample population because of our focus on retailers that operate in indoor shopping centers. For example, we excluded variety store merchants (i.e., SIC code 5331, composed of retail firms like Wal-Mart and Dollar General) and grocery stores (i.e., SIC code 5411, composed of firms like Kroger and Weis Markets) because these types of merchants are not typically found in indoor shopping malls, but rather strip malls.

Forty firms were identified using the selected SIC codes. These forty firms comprise *all* the actively traded merchants within the sampled SIC codes as established by a review of the Securities and Exchange Commission's (SEC) Electronic Data Gathering, Analysis, and Retrieval system (EDGAR) database. We verified that each firm had at least five years of historical results, that each firm reported minimum rent payments (or, rent expense) and that the firms were still actively traded on one of three exchanges, the New York Stock Exchange (NYSE), the NASDAQ National Market System (NMS), or the NASDAQ Capital Market (NAS) as of December, 2019. All firms met these criteria, and as such, our convenience sample comprised 40 firms.

We obtained ten years of annual financial results for each merchant from Mergent by FTSE Russell; we elected to retrieve fiscal years of 2009 – 2018 in order to use the most up-to-date and available annual data, and to provide the opportunity to collect enough data to ensure statistical significance. Eleven firm years could not be calculated due to missing or incomplete data, and as such, our final convenience sample consisted of 389 firm-year observations. Table I (Appendix) provides a profile of these firms.

The Process to Capitalize Leases for the On-Balance Sheet Scenario

To determine the balance sheet effect of lease capitalization, we queried annual report disclosures for 'minimum rent payments,' 'rent expense,' 'rental expense,' or 'gross rent expense' for each firm year observation. Values were copied into a spreadsheet. We did not include (reduce) amounts for sublease income; we did include contingent rent expense in the rent payment since shopping mall leases are typically structured with base and variable rent portions. Following Fülbier *et al*. (2008) and Moody's (2015), we applied a factor (six-times) to the minimum rent payment value to determine a lease-debt equivalent. Consistent with Imhoff *et al*. (1991) and Singh (2012), lease-asset equivalents were determined by applying a standard 75% asset to liability ratio on the lease-debt equivalents. Following Singh (2012), we calculated a change in deferred tax liability; we used an average effective tax rate of 20% (indicative of the

impact of the Tax Cuts and Jobs Act of 2017 (TCJA)), multiplying this amount by the difference in the lease-debt and lease-asset equivalent. The difference between the two liabilities (lease-debt and deferred tax liability) and lease-asset was calculated as an adjustment to retained earnings. Finally, like Imhoff *et al*. (1991), we assumed that any income statement effects were immaterial. The lease-debt equivalent, lease-asset equivalent, change in deferred tax liability, and adjustment to retained earnings were combined with the as-reported results to create the on-balance sheet scenario for each firm year observation. Table II (Appendix) summarizes these adjustments.

RESULTS

We began the analysis with a preliminary review of the data by comparing the firm years by zones 1, 2, and 3 in Table III (Appendix) for the off-balance sheet and on-balance sheet scenarios. Because the data points represent firm years, a single firm could have moved between zones multiple times during the 10 year period. The off-balance sheet scenario shows only 55 firm years in zone 1 with a high risk of bankruptcy and 36 firm years in zone 2 with a moderate risk bankruptcy. However, the on-balance sheet scenario depicts a rise in the number of firm years in zone 1 from 55 to 121 with no firm years in zone 2. In addition, 30 firm years moved from zone 3 to zone 1. These results suggest that adding leases to the balance sheet shows a greater propensity in bankruptcy risk as illustrated by the shifts between zones among the two groups.

Next, we ran descriptive statistics using two methods, Fisher's exact test and a mean comparison. Fisher's exact test, which compared the proportions of both the on- and off-balance sheet scenarios, indicated that the proportions of the two groups were indeed significantly different by zone (p = .000) as indicated in Table IV (Appendix). In addition to the difference in proportions, the mean comparison presented in Table V (Appendix) showed that means were different for both on- and off-balance sheet scenarios for all of the independent variables presented: net working capital ratio, retained earnings to total assets, EBIT to total assets, and book value of equity to total assets. An ANOVA was used to gauge the statistical significance between group means for the individual risk zones for the on- and off-balance sheet scenarios. The p value for the combined groups for each of the independent variables were significant at the .01 level as shown in Table VI (Appendix). The F-stat and Eta Squared results for each of the four independent variables indicate that the mean differences are partially explained by the changes in risk zones.

After confirming that a significant difference in bankruptcy risk existed between the on- and off-balance sheet groups, we used MDA to evaluate statistical significance, to predict group membership, and to determine the predictive ability of the discriminant function. Two separate models were run for each scenario using SPSS. MDA models assume the normality of continuous variables and the absence of multicollinearity. Descriptive statistics were used to test data normality, and multicollinearity was assessed by reviewing the variance inflation factor (VIF). The results of both tests did not indicate either significant normality issues or multi-collinearity.

The overall MDA models fit the data well for both groups as indicated by the Wilks' lambda goodness of fit and Eigenvalue test (Table VII (Appendix)). The Wilks' lambda goodness-of-fit tests whether the discriminant scores between zones are equal indicating that the models have no distinguishing power between groups (Norusis, 2005). The Wilks' lambda

goodness-of-fit test for the off-balance sheet was (8, N=389) = .353, and the on-balance sheet scenario was (4, N=389) = .629. The test for both models were significant (p=.000) meaning that the discriminant scores were not equal and the differences between zones and the models had predictive power. The Eigenvalue test, which represents the ratio of the between-group sum of squares to the within-group sum of squares, for both off-balance sheet scenario and on-balance sheet scenario were greater than 0, with values of 1.754 and .590 respectively. The higher the ratio is from zero, the better the overall model fit.

The explanatory power of both MDA models was significant as measured by the canonical correlation. Similar to the R^2 in linear regression, the square root of the canonical correlation indicates how much of the variance between the groups is explained by the independent variables. The squared canonical correlation for both the off-balance sheet scenario (CC^2=63.7%) and the on-balance sheet scenario (CC^2=37.1%) indicated that both models had explanatory power as to the movement of firm years between zones.

The significance of the independent variables used in MDA are evaluated using the structure matrix. The structure correlation coefficients represent the Pearson correlations between the discriminant function and independent variable values. The level of importance is normally determined as anything above the cut-off of .30 (Burns and Burns, 2008). As indicated in Table VIII (Appendix), all of the coefficients were significant above .30 accept the Book Value of Equity to Total Assets for the on-balance sheet scenario.

The change in standardized canonical discriminant coefficients, as illustrated in Table IX (Appendix), show the decline in the bankruptcy group means of the financial ratios between the on-balance sheet and off-balance sheet scenarios. All of the coefficient values of the independent variables were lower for the on-balance sheet scenario relative to the off-balance sheet variables except for the book value of equity to total assets ratio. If the coefficients determine group membership, we would expect the coefficient to decline in determining bankruptcy if each firm's ratios worsened when leases were added back to the balance sheet. For example, EBIT to total assets ratio should decline when the leases are included in total assets. Therefore, the coefficient would be smaller when multiplied by the ratio to determine the value in determining group membership.

Finally, the classification matrix in Tables X and XI (Appendix), which demonstrates each model's ability to predict group membership, provided strong overall correct classification percentages for both the on-balance sheet and off-balance sheet scenarios, 83.5% and 82.3%, respectively. After running the individual firm years through the models to approximate zone membership, a comparison was made of the model results and actual zone membership to determine the strength of the models classification accuracy.

Based on the ANOVA and MDA results, we can reject the null hypotheses for H_1 and H_2 given the statistical results. We can reject the first hypothesis which assessed financial risk with financial ratios,

H_1 – *There is no significant difference in financial risk between the off-balance sheet scenario and the on-balance sheet scenario.*

First, group means of the financial ratio, independent variables were significantly different from each other relative to bankruptcy zones as indicated by the ANOVA results. Second, the MDA standardized canonical correlation results showed that the coefficients decreased for the net working capital ratio, retained earnings to total assets, and EBIT to total assets in the determination of bankruptcy zone membership. Since the financial risk indicated by each ratio increased when adding leases to the balance sheet, we would expect the coefficient

used to calculate zone membership would in turn get smaller since risk of bankruptcy worsens when financial ratios deteriorate.

We can reject the second hypothesis which assesses bankruptcy risk with zones of discrimination.

H_2 – *There is no significant difference in bankruptcy risk between the off-balance sheet scenario and the on-balance sheet scenario.*

When we observe the 389 firm years broken out by bankruptcy zones, we see a clear shift in firm years from the safe balance sheet (zone 3) and caution zones (zone 2) to the company in distress (zone 1) when we move from the off-balance sheet to the on-balance scenario. The MDA classification matrix provides statistical evidence that the shift in firm years increased the risk of bankruptcy by providing overall correct classification percentages above 80% for both the off-balance sheet and on-balance sheet scenarios.

Does Topic 842 reveal an increased financial risk?

Topic 842 appears to reveal increased financial risk post capitalization of leases onto the balance sheet. Three of the financial ratios indicated a decline in performance when the leased asset and related liability were added to the balance sheet based upon our MDA analysis. Topic 842 appears to force retail firms to more accurately portray the associated financial risk impact of brick-n-mortar facilities used in the ordinary course of business. The decline in the balance sheet ratios indicates that leased assets do increase firm risk.

Does Topic 842 reveal an increased risk of bankruptcy?

The results indicate a significant, observable shift in bankruptcy risk to firm performance due lease capitalization. If Topic 842 had been in place over the years included in the research study, the majority of the firms would have produced results indicating a greater risk of bankruptcy.

DISCUSSION

As stated earlier, the purpose of this study is to extend existing literature by evaluating whether the adoption of Topic 842 by U.S. publicly-traded merchants (or, the lessees) revealed increased bankruptcy risk. The significant finding of our study suggests that Topic 842 would have produced financial results which showed that the same "mall centric" firms in our sample were at a greater risk of bankruptcy than the results, as published during the 10 year time period for those same firms in which the data was collected, originally indicated. When comparing the on-balance sheet and off-balance sheet scenarios through an MDA analysis, we see that bankruptcy risk, as measured by the 3 zones using Altman Z", increased for the operating firm years used in this study; there was a clear shift observed from the safe and caution zones to the distress zone. While one-half of the sampled firms changed zones post capitalization in at least one or more firm years during the 10 year time period, 14 entities moved from Zone 3 or 2 to Zone 1 post capitalization, and did not return to a more favorable zone of discrimination. Consistent with Altman (2013), these same 14 merchants were classified as distressed for an average of 4.6 firm years. It is apparent, then, that the lease accounting employed during the study period permitted retail firms to classify leases as operating, or off-balance sheet leases,

resulting in improved financial performance than had firms capitalized leases as prescribed by Topic 842. If the new standard had been enacted earlier, it seemingly would have limited the practice of lease-structuring, where lease terms were established to specifically avoid capitalization on the balance sheet (Grossman and Grossman 2010).

The first research question, as previously stated, evaluates whether merchants' financial statements better represent financial risk after merchants have fully incorporated Topic 842's requirements. Previous research has provided significant evidence that lease capitalization does alter financial ratios (Mulford and Gram (2007), Singh (2012), Fafatas and Fischer (2016)). In similar fashion, our research showed that financial ratios declined when leases were capitalized on the balance sheet. MDA specifically showed that the net working capital ratio, retained earnings to total assets, and EBIT to total assets declined, as illustrated by the change in coefficients. Firms in our study were able to use lease-structuring to allow for operating lease treatment to portray improved financial ratio performance. Topic 842 would have effectively required lease capitalization resulting in diminished financial ratio performance and improved financial transparency.

The second research question in this study considered empirical evidence as to whether Topic 842 achieves its purpose of providing users the necessary information to understand the impact of a retailer's leasing activities, relative to bankruptcy. Previous research, such as Altman (2013), established bankruptcy models incorporating the financial ratios used in this study. However, very few bankruptcy studies have focused on the retail sector or a retail subsector. When comparing the off-balance sheet and on-balance sheet scenarios, we observed evidence from our MDA models, specifically in the model's overall correct classification of bankruptcy risk, which displayed a shift to riskier bankruptcy zones based on Altman Z". A greater proportion of firm years moved from Zones 2 and 3 to Zone 1 indicating distress. Topic 842 would have improved transparency related to retail firm financial performance relative to leases and bankruptcy risk. On-balance sheet lease capitalization would have translated into financial ratios indicating the true risk of bankruptcy.

A third ancillary question in our study was addressed by empirically validating whether the more conservative six times rent factor method can be used to assess financial and bankruptcy risk. As stated earlier, the literature has primarily focused on two methods of lease capitalization for empirical study, the discounted cash flow technique (Imhoff *et al.*, 1991, 1997) and factor method (Henraat *et al.*, 2013). We employed the factor method in our research to arrive at the balance sheet impact by multiplying the firm minimum rent payment value by six to determine the lease-debt equivalent. Next, the lease asset was calculated by taking 75% of the lease-debt. Finally, related adjustments were made for changes in deferred tax liability and retained earnings. The six factor method used in our study was validated by the results of our MDA models. Both the on-balance sheet and off-balance sheet scenario models were statistically significant in accurately classifying more than 80% of the firm years by zone. These rates are consistent with the one-year (95%) and two year (72%) bankruptcy classification rates first reported by Altman (2013).

STUDY LIMITATIONS AND FUTURE RESEARCH

Our findings suggest that Topic 842 increases transparency in both financial performance and bankruptcy risk by effectively requiring capitalization of all leases. However, the results are limited by several factors. First, the results are limited to a convenience sample of "indoor, mall

centric" publicly traded retail firms. While we believe the results are applicable to other industries, we realize that the balance sheet risk of lease capitalization may not present a significant impact to asset or liability balances in other sectors. Even some retail firms, for example, do not maintain a significant brick-n-mortar presence as a majority of their sales and operations are carried out virtually. Second, we recognize that not all firms engaged in lease-structuring and appropriately capitalized leases where appropriate. Third, while the six factor method was found to be statistically significant in our results, the balance sheet impact may be different based on a firm's final interpretation and application of Topic 842. Finally, we did not control for macroeconomic changes in our study. However, because our study uses 10 fiscal years after the 2008 great recession, including both years of economic growth and economic struggle, we believe that our time frame averages out any extreme economic effects.

Opportunities for future research include application of our bankruptcy risk modeling to other retail sectors that have historically leased space such as the restaurant and entertainment industries. Specifically, an evaluation of industries should be made where Topic 842 has forced firms that traditionally use off-balance sheet leasing to appropriately capitalize leases on to the balance sheet. Second, the time period used in this study reflected a period of economic recovery after the 2008 real estate financial crisis. Research should consider whether improved transparency of bankruptcy risk could be achieved by the application of Topic 842 in times of market turbulence. Finally, future research could leverage *ex post* analysis using actual, reported financial results over several years; this would allow future researchers to assess the validity of our results by using as-reported values.

CONCLUSION

This study contributes to the literature by clarifying the implication of moving off-balance sheet financing onto the balance sheet under the new lease standard for certain retailers, specifically those merchants which typically operate in indoor shopping malls. The results suggest that the new standard achieves its aims of increasing transparency, in this case by illuminating financial and bankruptcy risk for the sampled merchants. Moreover, our study provides empirical evidence that the financial position of some specific retailers could be weaker than conventional wisdom suggests.

The results elevate the importance of good financial management, especially during the current retail apocalypse, and retail managers should take notice. Specifically, our results suggest that lease capitalization will significantly impact the sampled firms' working capital, profitability and asset ratios, which could make it harder for struggling mall-based merchants to find additional external financing or to secure advantageous interest rates. Therefore, managers may want to consider immediately reducing their asset bases, cutting discretionary expenses, or renegotiating lease terms, among other actions before they seek new capital. Additionally, an increased appearance of bankruptcy post-capitalization should propel retail managers to communicate more frequently and with greater transparency to assure stakeholders that their respective firms will remain a going concern. This is especially important during the Covid-19 pandemic which has created additional financial concerns for many retailers (Ashworth, 2020).

Our results also affirm that accounting policy makers should continue to advance standards that increase transparency. Even though transparency is not a prescribed fundamental or enhancing qualitative characteristic under FASB Concept Statement No. 8, transparency is vital for efficient markets, access to credit, and managerial accountability. In the context of

bankruptcy risk, accounting standards that help investors better understand and estimate their exposure are critical, especially during the retail apocalypse era. We laud FASB's intentions in the new lease standard, and urge FASB to continue to pursue standards that enhance open and honest financial reporting.

In summary, retailers that typically operate in indoor shopping malls provided a novel environment through which to study whether the new lease standard reveals greater financial and bankruptcy risk because these retailers have been disproportionately affected by the retail apocalypse. During the 10 year time period examined, the significant finding of this study showed that the sampled firms were at greater risk of bankruptcy under the new standard than previously assumed under their as-reported financial values. If the new standard had been enacted earlier, it seemingly would have provided investors with greater insight into a firm's financial position. Consequently, the results appear to affirm FASB's desire to increase understanding and comparability in financial reporting through lease capitalization.
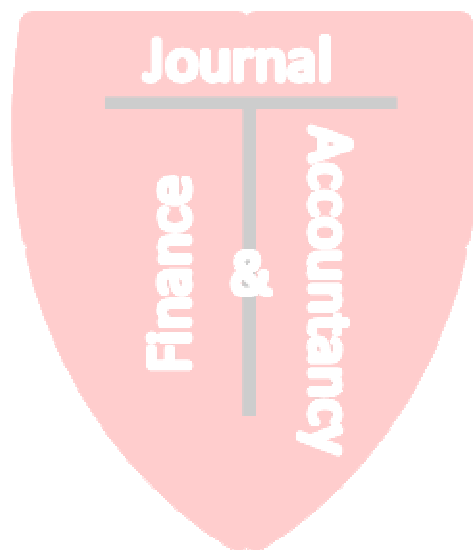
REFERENCES

Agarwal, A., and Patni, I. (2019), "Applicability of Altman Z-Score in bankruptcy prediction of BSE PSUs", *Journal of Commerce & Accounting Research,* Vol. 8 No. 2, pp. 93-103.

Alaka, H. A., Oyedele, L. O., Owolabi, H. A., Ajayi, S. O., Bilal, M., and Akinade, O. O. (2016), "Methodological approach of construction business failure prediction studies: a review", *Construction Management & Economics*, Vol. 34 No. 11, pp. 808–842.

Altman, E. I. (1968), "Financial ratios, discriminant analysis and the prediction of corporate bankruptcy" *The Journal of Finance*, Vol. 23 No. 4, pp. 589-609.

Altman, E. I. (1976), "Capitalization of leases and the predictability of financial ratios: A comment", *The Accounting Review,* Vol. 51 No. 2, pp. 408-412.

Altman, E. I. (2013), "17 - Predicting financial distress of companies: revisiting the Z-Score and ZETA® models" Bell, A.R., Brooks, C., and Prokopczuk, M. (Eds.), *Handbook of Research Methods and Applications in Empirical Finance,* Edward Elgar Publishing Inc., Northampton, MA.

Altman, E. I., Haldeman, R. G., and Narayanan, P. (1977), "ZETA^{TM} analysis: A new model to identify bankruptcy risk of corporations", *Journal of Banking & Finance,* Vol. 1 No. 1, pp. 29-54.

Altman, E. I., Iwanicz-Drozdowska, M., Laitinen, E. K., and Suvas, A. (2017), "Financial distress prediction in an international context: A review and empirical analysis of Altman's Z-score model", *Journal of International Financial Management & Accounting,* Vol. 28 No. 2, pp. 131-171.

Ashworth, W. (2020, April 28). Bankruptcy watch: 10 retail stocks at growing risk. *Kiplinger*. Retrieved from https://www.kiplinger.com.

Barone, E., Birt, J., and Moya, S. (2014), "Lease accounting: A review of recent literature", *Accounting in Europe,* Vol. 11 No. 1, pp. 35-54.

Batchelor, T. (2018), "Corporate bankruptcy: Testing the efficacy of the Altman Z-score", *International Research Journal of Applied Finance,* Vol. 9 No. 9, pp. 404-414.

Beattie, V., Edwards, K., and Goodacre, A. (1998), "The impact of constructive operating lease capitalisation on key accounting ratios", *Accounting and Business Research,* Vol. 28 No. 4, pp. 233-254.

Beaver, W. (1966), "Financial ratios as predictors of failure", *Journal of Accounting Research,* Vol. 4, pp. 71-111.

Benjamin, J. D., Boyle, G. W., and Sirmans, C. F. (1992), "Price discrimination in shopping center leases", *Journal of Urban Economics,* Vol. 32 No. 3, pp. 299-317.

Bennett, B. K., and Bradbury, M. E. (2003), "Capitalizing non-cancelable operating leases", *Journal of International Financial Management & Accounting,* Vol. 14 No. 2, pp. 101-114.

Bhargava, M., Dubelaar, C., and Scott, T. (1998), "Predicting bankruptcy in the retail sector: an examination of the validity of key measures of performance", *Journal of Retailing and Consumer Services*, Vol. 5 No. 2, pp. 105–117. https://doi.org/10.1016/S0969-6989(97)00029-5

Bhattarai, A. (2019), "Malls are dying. The thriving ones are spending millions to reinvent themselves", *The Washington Post,* November 22, https://www.washingtonpost.com/business/2019/11/22/malls-are-dying-only-these-ones-have-figured-out-secrets-success-internet-age/

Burns, R., and Burns, R. (2008), *Business research methods and statistics using SPSS,* Sage Publications, London.

Casabona, P. A., & Coville, T. G. (2018). FASB's new accounting standard on leases: Overview of some key requirements for lessees and implementation considerations. *Review of Business, 38(1),* 59–73.

Caster, P., Scheraga, C. A., and Olynick, M. J. (2018), "The impact of lease accounting standards on airlines with operating leases: Implications for benchmarking and financial analysis", *Journal of Transportation Management,* Vol. 28 No. 1, pp. 15-23.

Doś, A. (2017), "Financial performance and bankruptcy risk of socially responsible and "irresponsible" companies–the Polish case", *Financial Management of Firms and Financial Institutions,* Vol. 201, pp. 201-208.

Du Jardin, P. (2009), "Bankruptcy prediction models: how to choose the most relevant variables?", *Bankers, Markets & Investors,* Vol. 98 No. 1, pp. 39–46.

Durocher, S. (2008), "Canadian evidence on the constructive capitalization of operating leases", *Accounting Perspectives,* Vol. 7 No. 3, pp. 227-256.

Edelman, C. A., and Petzold, A. A. (1996), *Percentage rent--alignment of interests or antagonistic coexistence?,* (Doctoral dissertation, Massachusetts Institute of Technology).

Eidleman, G. J. (1995), "Z scores--a guide to failure prediction", *CPA Journal,* Vol. 65 No. 2, pp. 52-53.

Elam, R. (1975), "The effect of lease data on the predictive ability of financial ratios", *Accounting Review,* Vol. 50 No. 1, pp. 25-42.

Fafatas, S., and Fischer, D. (2016), "The effect of the new lease accounting rules on profitability analysis in the retail industry", *Journal of Accounting and Finance,* Vol. 16 No. 5, pp. 111-122.

Financial Accounting Standards Board (FASB). (n.d.). Accounting Standards Update No. 2016-02, Leases (Topic 842). Retrieved from https://www.fasb.org/cs/Satellite?c=FASBContent_C&cid=1176167904031&pagename=FASB%2FFASBContent_C%2FCompletedProjectPage

Fülbier, R. U., Silva, J. L., and Pferdehirt, M. H. (2008), "Impact of lease capitalization on financial ratios of listed German companies", *Schmalenbach Business Review,* Vol. 60 No. 2, pp. 122-144.

Giner, B., and Pardo, F. (2017), "Operating lease decision and the impact of capitalization in a bank-oriented country", *Applied Economics,* Vol. 49 No. 19, pp. 1886-1900.

Grossman, A. M., and Grossman, S. D. (2010), "Capitalizing lease payments", *CPA Journal,* Vol. 80 No. 5, pp. 6–11.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., and Tatham, R. L. (2006), *Multivariate Data Analysis* (6th ed.), Pearson, Upper Saddle River, NJ.

Hamid, T., Akter, F. A. R. Z. A. N. A., and Rab, N. B. (2016), "Prediction of financial distress of non-bank financial institutions of Bangladesh using Altman's Z score model", *International Journal of Business and Management,* Vol. 11 No. 12, pp. 261-270.

Hayes, S. K., Hodge, K. A., and Hughes, L. W. (2010), "A study of the efficacy of Altman's Z to predict bankruptcy of specialty retail firms doing business in contemporary times", *Economics & Business Journal: Inquiries & Perspectives,* Vol. 3 No. 1, pp. 130-134.

Henraat, D., Georgakopoulos, G., Kalantonis, P., and Rodosthenous, M. (2013), "A comparative empirical study for the different approaches of the operational leases capitalization", *Journal of Computational Optimization in Economics and Finance,* Vol. 5 No. 1, pp. 51-68.

Holzmann, O. J., & Munter, P. (2016). Leases to be recognized on lessee balance sheets. *Journal of Corporate Accounting & Finance (Wiley), 27(6),* 97–101.

Imhoff, E. A., Lipe, R. C., and Wright, D. W. (1991), "Operating leases: Impact of constructive capitalization", *Accounting Horizons,* Vol. 5 No. 1, pp. 51-63.

Imhoff, E. A., Lipe, R. C., and Wright, D. W. (1997), "Operating leases: Income effects of constructive capitalization", *Accounting Horizons,* Vol. 11 No. 2, pp. 12-32.

Jesswein, K. R. (2009), "Analyzing creditworthiness from financial statements in the presence of operating leases", *Academy of Accounting and Financial Studies Journal,* Vol. 13 No. 1*,* pp. 75-90.

Kim, S. Y., and Upneja, A. (2014), "Predicting restaurant financial distress using decision tree and AdaBoosted decision tree models", *Economic Modelling*, Vol. 36, pp. 354-362.

Kingyens A.T., Paradi J.C., and Tam F. (2016), "Bankruptcy prediction of companies in the retail-apparel industry using data envelopment analysis", Aparicio J., Lovell C., and Pastor J. (Eds.), *Advances in Efficiency and Productivity. International Series in Operations Research & Management Science, 249.* Springer.

Lawrence, E. C., and Bear, R. M. (1986), "Corporate bankruptcy prediction and the impact of leases", *Journal of Business Finance & Accounting,* Vol. 13 No. 4, pp. 571-585.

Lee, B., Paik, D. G., and Yoon, S. W. (2014), "The effect of capitalizing operating leases on the immediacy to debt covenant violations", *Journal of Accounting and Finance,* Vol. 14 No. 6, pp. 44-70.

Lev, B., and Sunder, S. (1979), "Methodological issues in the use of financial ratios", *Journal of Accounting and Economics,* Vol. 1 No. 3, pp. 187-210.

Lückerath-Rovers, M. (2009), "Financial distress prediction and operating leases", Available at SSRN: https://ssrn.com/abstract=1411691 or http://dx.doi.org/10.2139/ssrn.1411691

Maglio, R., Rapone, V., and Rey, A. (2018), "Capitalisation of operating lease and its impact on firm's financial ratios: Evidence from Italian listed companies", *Corporate Ownership & Control*, Vol. 15 No. 3, pp. 152-162.

Manaseer, S., and Al-Oshaibat, S. D. (2018), "Validity of Altman Z-score model to predict financial failure: Evidence from Jordan", *International Journal of Economics and Finance,* Vol. 10 No. 8, pp. 181-189

McGurr, P., and DeVaney, S. (1998), "Predicting business failure of retail firms: An analysis using mixed industry models", *Journal of Business Research,* Vol. 43 No. 3, pp. 169-176.

Moody's (2015), "Moody's updates its global methodology for financial statement adjustments", [Press release]. Retrieved from https://www.moodys.com/research/Moodys-updates-its-global-methodology-for-financial-statement-adjustments--PR_327853.

Morales-Díaz, J., and Zamora-Ramírez, C. (2018), "The impact of IFRS 16 on key financial ratios: A new methodological approach", *Accounting in Europe,* Vol. 15 No. 1, pp. 105-133.

Mulford, C. W., and Gram, M. (2007), "The effects of lease capitalization on various financial measures: An analysis of the retail industry", *Journal of Applied Research in Accounting and Finance,* Vol. 2 No. 2, pp. 3-13.

Newhard, J. J. (2017). Lease accounting: 842 wake-up call. *Pennsylvania CPA Journal, 88(2)*, 32–36.

Norusis, M. J. (2005), *SPSS 13.0 statistical procedures companion*. Prentice Hall Inc., Upper Saddle River, NJ.

Nuryani, N., Heng, T. T., and Juliesta, N. (2015), "Capitalization of operating lease and its impact on firm's financial ratios", *Procedia - Social and Behavioral Sciences,* Vol. 211*, pp. 268–276.

Pam, W. B. (2013), "Discriminant analysis and the prediction of corporate bankruptcy in the banking sector of Nigeria", *International Journal of Finance and Accounting,* Vol. 2 No. 6, pp. 319-325.

Pang, J., and Kogel, M. (2013), "Retail bankruptcy prediction", *American Journal of Economics and Business Administration,* Vol. 5 No. 1, pp. 29-46,

Pardo, F., and Giner, B. (2018), "The capitalization of operating leases: Analysis of the impact on the IBEX 35 companies", *Intangible Capital,* Vol. 14 No. 3, pp. 445-483.

Porter, J. C. (2016). A refresher on accounting for leases. *CPA Journal, 86(1),* 24–33.

Rossi III, J. D. (2018). Lease modifications. *Pennsylvania CPA Journal,* 1–2.

Sari, E., Altintas, A. T., and Taş, N. (2016), "The effect of the IFRS 16: constructive capitalization of operating leases in the Turkish retailing sector", *Journal of Business, Economics and Finance (JBEF),* pp. 2146-7943.

Securities and Exchange Commission. (2003), *Report and Recommendations Pursuant to Section 401(c) of the Sarbanes-Oxley Act of 2002 On Arrangements with Off-Balance Sheet Implications, Special Purpose Entities, and Transparency of Filings by Issuers,* Retrieved from https://www.sec.gov/news/studies/soxoffbalancerpt.pdf.

Singh, A. (2012), "Proposed lease accounting changes: Implications for the restaurant and retail industries", *Journal of Hospitality & Tourism Research,* Vol. 36 No. 3, pp. 335-365.

Sliwoski, L. J. (2017). Understanding the new lease accounting guidance. *Journal of Corporate Accounting & Finance (Wiley), 28(4),* 48–52. https://doi.org/10.1002/jcaf.22273

Sun, J., Li, H., Huang, Q. H., and He, K. Y. (2014), "Predicting financial distress and corporate failure: A review from the state-of-the-art definitions, modeling, sampling, and featuring approaches", *Knowledge-Based Systems*, Vol 57, pp. 41-56.

Veverková, A. (2019), "IFRS 16 and its Impacts on Aviation Industry", *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, Vol. 67 No. 5, pp. 1369-1377.

Youn, H., and Gu, Z. (2010), "Predict US restaurant firm failures: The artificial neural network model versus logistic regression model", *Tourism & Hospitality* Research, Vol. 10 No. 3, pp. 171-187. doi:10.1057/thr.2010.2

Zamora-Ramirez, C., and Morales- Díaz, J. (2018), "Effects of IFRS 16 on key financial ratios of Spanish companies" *Estudios de Economía Aplicada,* Vol. 36 No.(2), pp. 385–406.

APPENDIX

Table I: Financial Profile: 10-year Averages
($ Millions, except No. of Firm Years)

Description (SIC Code)	No. of Firms	No. of Firm Years	Min. Rent Payments	EBIT	Total Assets	Total LT Debt	Equity
Department Stores (5311)	6	58	$206	$733	$8,946	$3,955	$2,844
Men's/Boys' Clothing & Acc. (5611)	2	19	232	26	1,096	493	371
Women's Clothing Stores (5621)	8	80	245	234	1,755	932	386
Children's/Infants' Wear (5641)	1	10	118	312	1,729	692	790
Family Clothing Stores (5651)	14	137	316	629	3,005	797	1,266
Shoe Stores (5661)	5	47	240	197	1,443	208	944
Misc. Apparel/Accessory (5699)	4	38	72	137	690	191	357
Total	**40**	**389**	**243**	**$425**	**$3,093**	**$1,148**	**$1,136**

Table II: Average Impact of Lease Capitalization on Financial Results for the Sample
($ Millions)

Description (SIC Code)	Lease-Debt Equivalent	Lease-Asset Equivalent	Change in Def. Taxes	Adj. to Retained Earnings
Department Stores (5311)	$1,235	$926	($99)	($210)
Men's/Boys' Clothing & Acc. (5611)	1,390	1,042	(115)	(233)
Women's Clothing Stores (5621)	1,470	1,103	(115)	(252)
Children's/Infants' Wear (5641)	706	529	(54)	(122)
Family Clothing Stores (5651)	1,896	1,422	(148)	(325)
Shoe Stores (5661)	1,441	1,081	(113)	(247)
Misc. Apparel/Accessory (5699)	430	322	(33)	(75)
Total	**$1,456**	**$1,092**	**($115)**	**($249)**

Table III: Retailer Profile by Lease Treatment of Off- vs On-Balance Sheet

	Off-Balance Sheet Firms	On-Balance Sheet Firms
Total Sample (*n = 389 firm years*)	**389**	**389**
by Zones		
Zone 1 – Company in Distress	55	121
Zone 2 – Caution Zone	36	0
Zone 3 – Safe Balance Sheet	298	268

The data presented in Table III encompasses a 10-year period for 40 "mall-centric" firms between the periods 2009 – 2018. The sample is presented in two states of lease treatment of both off- and on-balance sheets.

Table IV: Descriptive Statistics

Fisher's Exact Tests: Between Bankruptcy Risk Zones

	Normal Approximation			Fisher's Exact		
Variable	*N*	*Z-Value*	*P-Value*	*N*	*Z-Value*	*P-Value*
Zone 1	389	-5.78	.0000	389	0.00	.0000
Zone 2	389	6.30	.0000	389	0.00	.0000
Zone 3	389	2.42	.0000	389	0.00	.0000

* $p < 0.01$

Table V: Descriptive Statistics

Mean Comparison: Between Bankruptcy Risk Zones

	Off-Balance Sheet			On-Balance Sheet		
Variable	*N*	*M*	*SD*	*N*	*M*	*SD*
Net Working Capital Ratio	389	.2818	.1336	389	.1810	.0880
Retained Earnings to Total Assets	389	.2429	.6596	389	-11.7000	220.4158
EBIT to Total Assets	389	.1197	.1296	389	.0790	.0804
Book Value of Equity to Total Assets	389	1.2033	.9908	389	.3289	.2868

Table VI: ANOVA Results

ANOVA: Between Bankruptcy Risk Zones

Variable	Off-Balance Sheet			On-Balance Sheet		
	F-Stat	Eta Squared	P Value	F-Stat	Eta Squared	P Value
Net Working Capital Ratio	90.700	.320	.000	79.986	.171	.000
Retained Earnings to Total Assets	136.247	.414	.000	8.544	.022	.004
EBIT to Total Assets	48.377	.200	.000	56.843	.128	.000
Book Value of Equity to Total Assets	88.222	.314	.000	155.608	.287	.000

* $p < 0.01$

Table VII: MDA Goodness-of-Fit Tests

MDA: Wilks' Lambda

Function	Off-Balance Sheet			On-Balance Sheet		
	Wilks Lambda	Chi Squared	P Value	Wilks Lambda	Chi Squared	P Value
1	.353	400.777	.000	.629	178.533	.000

MDA: Eigenvalues

Function	Off-Balance Sheet			On-Balance Sheet		
	Eigen value	Canonical Correlation	Canonical Correlation^2	Eigen value	Canonical Correlation	Canonical Correlation^2
1	1.754	.798	63.7%	.590	.609	37.1%

Table VIII: Discriminant Analysis: Structure Matrix

Predicted Group	Off-Balance Sheet	On-Balance Sheet
Net Working Capital Ratio	.5160	.8260
Retained Earnings to Total Assets	.3770	.5920
EBIT to Total Assets	.6280	.4990
Book Value of Equity to Total Assets*	.5050	.1930

* Coefficients greater than .30 are significant

Table IX: Discriminant Analysis: Standardized Canonical Coefficients

Predicted Group	Off-Balance Sheet	On-Balance Sheet
Net Working Capital Ratio	.4160	.2060
Retained Earnings to Total Assets	.6210	.2120
EBIT to Total Assets	.5510	.4700
Book Value of Equity to Total Assets*	.4010	.7300

Variable was not significant

Table X: Classification matrix – Predicted Group Membership

	Off-Balance Sheet		
Predicted Group	Zone 1	Zone 2	Zone 3
Zone 1	33	22	0
Zone 2	0	36	0
Zone 3	0	42	256
Total N	33	100	256
Percent Correct			
Zone 1	60%	40%	0
Zone 2	0	100%	0
Zone 3	0	14.1%	85.9%
Overall Correct Classification	*83.5%*		

Table XI: Classification matrix – Predicted Group Membership

	On-Balance Sheet	
Predicted Group	Zone 1	Zone 3
Zone 1	97	24
Zone 3	45	223
Total N	142	247
Percent Correct		
Zone 1	80.2%	19.8%
Zone 3	16.8%	83.2%
Overall Correct Classification	*82.3%*	