University of Southampton

Faculty of Social Sciences

Southampton Business School

Essays on Leasing

by

Fatma Bneijara

Thesis for the degree of PhD in Business Studies and Management

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Abstract

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The aim of this thesis is to investigate the role of operating leases, off-balance sheet lease agreements, in the context of corporate financing, major investment decisions, and debt contracting agreements. This research is particularly timely given that a new leasing accounting standard took effect in 2019 significantly changing the accounting rules for operating leases. Under this new leasing accounting rule (IFRS 16 leases), all assets and liabilities arising from operating-lease agreements must be brought back into the balance sheet and no longer allowing the off-balance sheet treatment of operating leases.

Our first analysis revisits the use of off-balance sheet leasing by UK firms. We present robust evidence that supports the existence of an "off-balance sheet" incentive to operating-lease financing from a firm's perspective. We show that the dependency of UK firms on off-balance sheet lease financing has become more pronounced between the years 2000 and 2016. This study also finds that firms with a higher probability of insolvency are more likely to use off-balance sheet leasing to access additional funds without compromising their level of reported debt.

Building on our first findings, our subsequent analysis focuses on the role of off-balance sheet leasing in explaining the failure of one major type of firm investment decision, (i.e. the decision to Merge or Acquire other firms (M&A)). We hypothesise and find that the likelihood that an M&A deal is terminated, after the announcement date, increases significantly if a firm seeks to acquire a target with a high level of off-balance sheet leasing. This relationship is highly significant in the period prior to the 2008 Global Financial Crisis (GFC). Thus, we support the view that off-balance sheet lease financing increases opacity and decreases the trustworthiness of firms' reported accounting information.

Finally, our last analysis finds that in the context of private loan contracts, firms use significantly more off-balance sheet leasing when approaching debt covenant violations. We also find that these firms are particularly highly leveraged and low performing.

In a nutshell, this thesis presents significant support for the view of operating leases as a strategic corporate financing tool, allowing companies to access additional funds without compromising their level of reported Debt to Equity ratio. This thesis also provides strong evidence that supports the accounting standard setters' ambition that the implementation of the new IFRS 16 leases rules will result in better accounting transparency to all market participants and financial statement users.

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Research Thesis: Declaration of Authorship

Print name: Fatma Bneijara

Title of thesis: Essays on Leasing

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

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Dedication

I would like to dedicate this thesis to my dear late father, *Sid'Ahmed Bneijara*.

He was my mentor, my soulmate and the best father a girl could have.

May his memory be forever a comfort and a blessing.

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I would like to thank all my family for their continued love and encouragement, especially my mother, my husband and my lovely son *Cheikh*.

Chapter 1 Introduction

1.1 Aims

For many years, the recognition and disclosure of assets and liabilities arising from operating leases has drawn attention and raised concern from regulators, academics, and financial statement users. The complexity and the lack of clarity regarding the distinction between operating and finance leases acted as a loophole that financial statements preparers were able to manipulate for many years removing a substantial amount of off-balance sheet liabilities from regulators' and investors' attention (Alexander, Britton, Jorissen, Hoogendoorn, and Van Mourik, 2017). Under the old (and now superseded) leasing accounting rules, known as the International Accounting Standard 17 or IAS 17 leases, firms could account for a lease agreement as either a finance or an operating lease. More importantly for the current thesis, assets and liabilities arising from operating leases are disclosed off the balance sheet and in the notes to the financial statement.

It is interesting to note that proposals and discussions to amend the previous lease accounting models have been on the Accounting Standards Board agenda since 1999. However, it was not until 2006 that the International Accounting Standards Board (IASB) and the U.S. Financial Accounting Standards Board (FASB) announced their intention to develop a new accounting standard that will provide a single accounting treatment model for all types of leases. The new leasing accounting standard (IFRS 16 leases) took effect in 2019 and significantly changed the accounting treatment for operating leases by bringing all liabilities arising from operating leases into the balance sheet.

In light of these changes in leasing standards and from a corporate finance perspective, the current thesis seeks to investigate what drivers underpin the use of operating leases. In a second step, we focus on firms' use of off-balance sheet leasing as a "hidden debt" and how this use affects firms' investment decisions, such as mergers and acquisitions, as well as the nature of the accounting information used for debt contract purposes.

1.2 Research Context

Under the old international accounting leasing framework (IAS 17 leases), operating leases were, in substance, similar to debt obligations as they give rise to assets and debt-like liabilities. However, they had the particularity of only being disclosed in the notes to the financial statement and were, therefore, off the balance sheet. Meanwhile, when compared to finance leases, operating leases are by far the most common type of lease financing used by companies. According to the Financial Accounting Standards Board (FASB, 2013), an estimated $1 trillion operating lease commitments are kept off-balance sheet in U.S. public companies. In addition, from 1980-2007, Cornaggia, Franzen, and Simin (2013) indicate a substantial 745% increase in U.S. companies' operating leases to total debt ratio. This raises the question whether the off-balance sheet treatment of operating leases is the rationale behind their significant popularity.

Prior studies exploring the drivers behind the use of operating leases evolve around three main lines of investigation: 1) assessing the anticipated effect of bringing operating leases into the balance sheet (Cornaggia et al., 2013; Giner, Merello and Padro, 2019); 2) analysing the complementarity between leasing and debt (Imhoff, Lipe, and Wright, 1991; Beattie, Edwards, and Goodacre, 1998; Eisfeldt and Rampini, 2009); and 3) a more limited focus on how creditors account for firms' exposure to operating leases (Paik, Smith, Lee, and Yoon, 2015; Altamuro, Johnston, Pandit, and Zhang, 2014). These studies indicate that firms with significant use of operating leases, overestimate their performance and underestimate their level of debt and risk. This is attributed to the significant amount of assets and corresponding liabilities kept off-balance sheet.

In addition, previous studies suggest that firms use off-balance sheet lease financing as a form of manipulation of financial statements (Beatty, Liao, and Weber, 2010; Dechow, Ge, Larson, and Sloan, 2011; Cornaggia et al., 2013) or to increase their debt capacity without altering their financial statement metrics, an attribute particularly ideal for those facing cash flow constraints (Sharpe and Nguyen, 1995; Eisfeldt and Rampini, 2009; Rampini and Viswanathan, 2013). Other studies indicate that significant use of off-balance sheet lease financing reduces the usefulness of firms' accounting information. However, sophisticated creditors and investors take these off-balance sheet liabilities into account

when assessing equity risk (Ely, 1995) or for debt contracting purposes (Paik, Smith, Lee, and Yoon, 2015; Altamuro, Johnston, Pandit, and Zhang, 2014).

The current thesis extends previous studies in three distinctives ways. First, as the drivers underpinning the use of off-balance sheet leasing have been analysed primarily in a U.S. context and in response to limited and dated UK evidence, this thesis provides a more recent analysis seeking to understand why UK companies employ off-balance sheet leasing. Second, joining a newer stream of research that straddles the boundaries between the disciplines of corporate finance and accounting, our second analysis investigates the role of operating leases in the successful outcome of M&A bids. Prior studies argue that firms' accounting quality plays a significant role in firms' investment decisions, such as M&As. As firms' level of off-balance sheet commitments reflects the quality of its financial statement reporting quality, we extend these studies by providing new evidence regarding the role of operating leases in the success of M&A decisions. Third and finally, this thesis provides additional insights concerning firms' use of off-balance sheet lease financing when approaching debt-covenant violations and thereby extending previous research on firm debt contracting.[1]

1.3 Structure of the thesis

Chapter 2 is the starting point of this current research and focuses on providing an understanding of what drivers underpin firms' use of off-balance sheet leasing. The vast majority of prior studies focus on U.S. companies. Thus, in this chapter, we provide evidence from the UK in response to previous limited and dated evidence (Beattie et al., 1998). In line with prior trends observed with U.S. companies (Cornaggia et al., 2013; Lim, Mann, and Mihov, 2017), Chapter 2 documents a significant increase in UK firms' use of off-balance sheet financing from 2000-2016. More central to our thesis research aim, after controlling for traditional determinants of operating lease decisions, such as tax and size, we detect significant abnormal off-balance sheet activity that is not driven by traditional drivers of lease financing. This suggests that UK firms, when compared with

[1] Data availability explains the shift to a US dataset in Chapter 3 and 4. While operating lease data was manually collected for a sample of 161 companies in Chapter 2, the difficulty to manually collect operating lease data for 1711 target companies (Chapter 3) and 861 borrowing companies (Chapter 4) motivates the shift to a US analysis.

their U.S. counterparts, use operating leases uniquely for their accounting treatment (i.e., their off-balance sheet characteristics). Chapter 2 also presents substantial evidence that firms with significant use of off-balance sheet leasing have greater cash flow constraints and a higher likelihood of financial distress. In sum, the initial findings of Chapter 2 reiterate previous evidence presented in a U.S. context that UK companies are attracted to operating leases due to their ability to provide the company with access to additional funds without altering their level of reported debt, a characteristic particularly useful for financially constrained firms.

In Chapter 3, we focus on the effect of the use of off-balance sheet lease financing on one of the most important firm investment decisions, M&As. In particular, we analyse whether the existence and use of off-balance sheet leasing by target companies increases the likelihood that an announced M&A deal is subsequently terminated.

Operating leases are by definition a form of debt. However, a key aspect of this debt, which is a key focus that we maintain throughout this thesis, is that this debt is fundamentally "hidden debt." All assets and liabilities arising from operating lease transactions appear only on the notes to companies' financial statements away from regulators', investors', and any financial statement user's attention.

In the context of M&A's, the off-balance sheet characteristic of operating leases is potentially important in adding to the understanding of two main research questions previously explored in the M&A literature: 1) why are some announced M&A deals subsequently terminated? and 2) do M&A's create or destroy value?

Previous studies suggest that off-balance sheet leasing is a form of accounting "window dressing" that companies have used significantly over decades to boost their financing capacity without altering their level of reported debt (Eisfeldt and Rampini, 2009; Lim et al., 2017). In the context of M&A's, previous studies highlight an interesting relationship between M&A success and the quality and content of the target firm's accounting statements. Previous authors argue that the quality and accuracy of the accounting information communicated by the target firm's financial statements during the process of due diligence are related to significantly greater post-acquisition performance of the merged entity (Raman, Shivakumar, and, Tamayo, 2013; Skaife and Wangerin, 2013; Marquardt and Zur, 2014; Mc Nichols and Stubben, 2015; Martin and Shalev, 2017).

However, to the best of our knowledge, no studies have addressed how specifically a target's use of off-balance sheet leasing affects the success of major firm investment decisions including M&As. This gap in the literature is important to address for many reasons. First, off-balance sheet leasing is a predominant type of financing that many see as one of the remaining crevices of off-balance sheet financing that accounting regulators must address (IASB, 2016). In addition, during the process of transactional due diligence, significant amounts of off-balance sheet liabilities may signal an ambiguity of the target's true level of debt leading to potentially early abortion of the M&A deal process and deal termination (Skaife and Wangerin, 2013). Moreover, off-balance sheet leasing is an important accounting information attribute and prior studies indicate that its use significantly deteriorates the quality and reliability of the accounting information conveyed by firms' financial statements (Beatty et al., 2010). Therefore, it is important to investigate whether acquisitions of target firms with significant use of off-balance sheet lease financing are more likely to fail or destroy value for the acquiring company. To test the effect of targets' off-balance sheet leasing on the likelihood of unsuccessful M&As, we use a dataset of 1,711 U.S. domestic merger and acquisition deals from 1983-2018.

Chapter 3 provides robust evidence supporting the likelihood that an announced M&A deal is subsequently terminated increases significantly with the target firm's use of off-balance sheet lease financing. In light of the new leasing accounting rules (IFRS 16 leases), our findings are in line with the regulator's view that bringing off-balance sheet leasing into the balance sheet will provide greater transparency and comparability between firms' financial statements potentially resulting in fewer failures in future M&A deals.

Additionally, and in line with the focus of this thesis regarding the use of off-balance sheet leasing as a hidden debt, Chapter 4 takes a different approach to investigate incentives behind a firm's significant use of off-balance sheet financing. This chapter builds on prior research, as well as Chapter 2's findings, that highly levered firms and firms with significant financial constraints are more likely to use off-balance sheet leasing. One explanation could be that as borrowing increases a firm's reported debt, companies are more likely to opt for off-balance sheet financing, especially when the debt agreement or covenants between the lender and the borrowing firm are close to be violated.

Prior research investigating firms' behaviour when approaching debt covenant violations are primarily focused on managers' incentives to use earnings management tools to avoid debt covenant violations (De Fond and Jiambalvo, 1994; Dichev and Skinner, 2002; Franz, HassabElnaby, and Lobo, 2014; Fan, Thomas, and Yu, 2019; Malikov, Coakley, and Manson, 2019; Demerjian, Donovan, and Lewis-Western, 2020). However, studies investigating the relationship between off-balance sheet financing and the accounting information used in structuring loan agreements are limited. They suggest that creditors treat off-balance sheet leasing as a form of debt when structuring loan agreements (Paik et al., 2015; Altamuro et al. 2014). However, the results of these studies are based on the frequency of financial covenants used in debt contracts and do not provide a complete picture as to how borrowing firms could potentially manipulate their reported financial ratios in the specific context of proximity to a financial covenant violation. Therefore, Chapter 4 extends the previous research by investigating whether firms use more off-balance sheet lease financing when approaching a debt covenant violation.

Using a dataset of 861 U.S. companies with outstanding loan contracts from 2002-2018, Chapter 4 indicates that the propensity for being close to financial covenant violations is significantly higher for firms belonging to industries with a greater magnitude of off-balance sheet leasing. More importantly, the results suggest this relationship is specifically significant for highly levered firms. This empirical evidence builds upon the initial findings in Chapter 2 that firms with higher financial constraints are more likely to use off-balance sheet leasing. Thus, Chapter 4 provides empirical evidence to support that firms increase their use of off-balance sheet leasing to increase their debt capacity without altering their level of reported debt to avoid a potential debt covenant breach.

Finally, Chapter 5 presents our overall conclusions of the current thesis findings. It also highlights the policy implications of the current thesis, as well as acknowledging its limitations and future research openings.

Chapter 2 Drivers of off-balance sheet leasing: Evidence from the UK

2.1 Abstract

This chapter investigates the drivers underpinning the use of off-balance sheet leasing using a sample of UK firms. Our results show a significant increase in operating lease activity among UK firms listed on the FTSE350 index between the years 2000 to 2016. In addition, our findings infer that riskier firms, with higher probability of insolvency and greater cash constraints, use operating leases to finance fixed asset purchases and preserve their level of debt. We further show a negative and significant correlation between firms' level of debt and their abnormal operating lease activity or the amount of operating lease liabilities not explained by theoretical determinants. This relationship is more significant for financially distressed firms and those with lower levels of free cashflow.

2.2 Introduction

International Accounting Standard 17 (IAS 17 *leases*) allows the distinction in company accounts between two types of leasing contracts: operating and finance leases. Under IAS 17 *leases*, the primary difference between operating and finance leases is in the off-balance sheet treatment of liabilities arising from operating lease contracts. If the leasing contract gives the parties rights and obligations similar to those arising from a legal purchase, then the lease agreement qualifies as a finance lease and creates assets and debt-like liabilities for a lessee. In contrast, if, in substance, the leasing contract allows the lessee to use the underlying asset for a short period of time, which is comparable to a short-term rental, then the leasing agreement will qualify as an operating lease and only current rental payments are recognized as an expense on the income statement allowing future commitments relative to the operating lease agreement to be kept off-balance sheet.

This distinction between finance and operating leases results in many practical issues that provide loopholes for preparers of accounts (Alexander, Britton, Jorissen, Hoogendoorn, and Van Mourik, 2017). Therefore, the boundary between finance and operating leases has raised many concerns from both accounting regulators and market participants. IAS 17 is generally criticized over its inability to provide a complete and accurate representation of leasing transactions and in particular, operating leases.[2] In line with these criticisms, Zechman (2010) finds that firms deliberately structure leasing contracts in order to classify them as operating leases and keep the corresponding liabilities off-balance sheet. In addition, a substantial body of empirical evidence documents that off-balance sheet leasing is one of the most important sources of financing and companies have experienced a significant increase in its use (Beattie, Edwards, and Goodacre, 1998; Graham, Lemmon, and Schallheim, 1998; Eisfeldt and Rampini, 2009; Cornaggia, Franzen, and Simin, 2013; Lim, Mann, and Mihov, 2017; Dogan, 2016)

[2] In response to concerns over a lack of faithful presentation of firms' operating lease liabilities under the current accounting standard (IAS 17 leases), the International Accounting Standards Board (IASB) in association with the Financial Accounting Standards Board (FASB) has issued a new leasing accounting standard, IFRS 16 leases, under which the distinction between operating and finance leases will be removed requiring the capitalisation of all type of leases. IFRS 16 will be effective from the January a, 2019 and will affect all types of leases except leases with a contract term shorter than one year.

In the UK, and using a measure of leasing that accounts for both finance and operating leases, Beattie et al. (1998) argue that operating leases are a significant source of long-term financing of UK firms. In addition, Beattie, Goodacre, and Thomson (2000b) analyse the determinants that affect a firm's choice between leasing and debt. Their analysis is consistent with a greater use of leasing by small companies with greater cash flow constraints. Building on Beattie et al. (1998), as well as Beattie et al. (2000b), the goal of our study is to measure the magnitude of off-balance sheet leasing of UK firms. Our objectives are to understand why UK firms use operating leases and to investigate whether the use of off-balance sheet leasing responds to an incentive to manage the financial statement by keeping debt off the balance sheet.

As the key motivation of Beattie et al. (2000b) is to analyse the determinants of firms' lease ratios, this chapter extends Beattie et al. (2000b) by developing new empirical evidence regarding UK firms' operating lease activity. Our contribution is first methodological, as we base our analysis on a fixed effects model instead of the Ordinary Least Square (OLS) regression used in Beattie et al. (2000b). When compared to OLS regressions, fixed effects models control for the variation in firms' capital structure that are time invariant and is significant in explaining firms' financing choices (Frank and Goyal, 2009; Lemmon, Roberts, and Zender, 2008). In addition, our findings are robust to the choice of the operating lease proxy as the results are qualitatively the same using three different measures including the capitalisation method. In addition, we add to the understanding of the determinants of leasing in general and operating leases in particular. For instance, factors including the tax rate and firms' financial constraints are expected to have a significant impact on firms' propensity to lease (Graham et al., 1998; Eisfeldt and Rampini, 2009; Sharpe and Nguyen, 1995).

Following Cornaggia et al. (2013), we refer to a modified version of the Graham et al. (1998) leasing model that accounts for firm fixed effects. We define abnormal operating leases as the difference between observed and predicted off-balance sheet leasing. Finally, following Cornaggia et al. (2013), we integrate abnormal operating leases as an additional explanatory variable in the Lemmon et al. (2008) capital structure model.

Our results document a significant increase in UK firms' operating lease activity from 2000-2016. This trend is highly significant for different off-balance sheet leasing proxies.

Thus, our study is in line with Cornaggia et al. (2013) who note a similar trend for U.S. companies. Of particular interest to our investigation, we detect significant abnormal operating lease activity in our sample. This is negatively and significantly related to firms' level of debt. In other words, the UK listed firms observed in our sample exhibit a significant abnormal level of off-balance sheet leasing that is not explained by the theoretical determinants of operating leases. Thus, a significant component of UK off-balance sheet leasing is not explained by the economic benefit of lease financing. This result suggests that the accounting treatment of operating leases is a significant determinant of the operating lease trend observed over the 17 years of our sample period. We also find that the negative relationship between firms' debt and abnormal operating leases as defined by Cornaggia et al. (2013) is only significant for cash constrained firms with a high probability of financial distress. Furthermore, previous studies argue that managers restructure lease contracts to make them appear as operating lease contracts and move the subsequent liability off the balance sheet (Biondi, Bloomfield, Glover, Jamal, Ohlson, Perman, Tsuijiyama, and Wilks, 2011; Zechman, 2010). Our study contributes to this literature by demonstrating that the off-balance sheet characteristic of operating leases is important in explaining UK operating lease activity between the years 2000 and 2016.

The remainder of this chapter is organised as follows. Section 2.3 provides a review of the current literature regarding the determinants of operating leases. Section 2.4 presents the data and methodology used. Section 2.5 examines the results and findings for both the time series analysis and the determinants of operating lease activity of selected UK firms. Finally, Section 2.6 concludes the chapter.

2.3 Theories and empirical evidence on the determinants of leasing

2.3.1 Tax benefits and leasing

Prior studies indicate that corporate taxation is a significant theoretical determinant of a firm's propensity to lease (Lewellen, Long, and McConnell, 1976; Miller and Upton, 1976; Myers, Dill, and Bautista, 1976; Franks and Hodges, 1978; Brealey and Young, 1980). For instance, under the assumption of perfect market conditions, Myers et al. (1976) demonstrate that firms are indifferent between leasing and debt. However, in the

presence of different tax rates between the lessee and the lessor, the lessee will choose to lease instead of borrowing to take advantage of the tax deductibility of lease payments. In accordance with the tax advantage incentive emphasised by prior studies, Lewis and Schallheim (1992) highlight a negative relationship between the use of leasing and the lessee's marginal tax rates.

Empirically, numerous financial studies find that a firm's decision to use operating leases is significantly negatively related to its corporate tax rate (Graham et al. 1998; Lasfer and Levis, 1998; Beatty, Liao, and Weber, 2010; Schallheim, Wells, and Whitby, 2013; Lim et al. 2017). This relationship is explained by an exchange of tax advantages and lower lease payments between the lessee and the lessor. In fact, a lessee with a lower tax status transfers a tax advantage benefit to the lessor against a more favourable negotiation of the leasing contract. This type of lease is classified as a tax-lease or true-lease. Under UK tax regulations, rental payments relative to operating leases are fully deductible if the leasing contract is not a long funding lease.[3] As a consequence, not all operating leases are classified as a non-long funding lease from a lessee perspective and deductions from taxable income is not always achievable.

Finally, Devos and Rahman (2014) demonstrate that firms' propensity to lease is lower for high tax paying firms, providing that those firms are mainly located in rural areas, emphasising the importance of geographical location in explaining a company's operating lease activity.

2.3.2 Leasing and financial distress

A large body of literature regarding firms' incentive to lease argues that the financial health of the lessee firm is a significant determinant of a company's leasing activity. For instance, in the event of financial distress, Krishnan and Moyer (1994), as well as Barclay and Smith (1995), suggest that leasing contracts are paid with priority compared to conventional debt contracts. Similarly, Eisfeldt and Rampini (2009) argue that when compared to secured loans, leasing contracts are less risky for the lessor due to the ability to repossess the collateral in the event of insolvency. Additionally, the same authors

[3] Chapters 6 and 6A of Part 2 of the Capital Allowances Act 2001 present the rules for determining whether or not a lease contract is a long funding lease.

argue that the repossession advantage attached to leases is observed only in the case of operating leases. From a tax perspective, the latter is classified as a true lease where the lessor remains the effective owner of the asset and could repossess it in the event of bankruptcy (Graham et al. 1998). Thus, according to Eisfeldt and Rampini (2009), firms facing higher financial constraints can access operating lease financing more easily than conventional debt and exhibit higher operating lease commitments kept off-balance sheet. In accordance with Eisfeldt and Rampini (2009) and by focusing on the industry aggregate level, Rauh and Sufi (2012) find that firms with difficulty raising capital using traditional debt financing use lease contracts as a cheaper means of financing. Correspondingly, Sharpe and Nguyen (1995) support the existence of a significant positive correlation between operating leases and firms' financial variables that measure to what extent the lessee is financially constrained. Lim et al. (2017) demonstrate the same relationship by showing that firms with high expected costs of bankruptcy are more likely to lease due to lower the cost of borrowing associated with leasing. Empirically, Graham et al.'s (1998) results support a positive relationship between a firm's reliance on operating leases and the expected costs of bankruptcy. More recently, Beatty et al. (2010) argue that financial distress, as well as information asymmetry, are significant determinants of a firm's probability of using off-balance sheet leasing. Finally, using four different measures of firms' financial constraints, Kaplan and Zingales (1997), Whited and Wu (2006), Hadlock and Pierce (2010), and Dogan (2016) provide empirical evidence supporting a positive relationship between a firm's risk, expected failure, and its use of operating leases.

2.3.3 Other empirical findings on the determinants of leasing

Theoretical financial models document the importance of firms' characteristics, such as the investment opportunity set, to explain why they opt for lease financing (Sharpe and Nguyen, 1995). By contrasting firms with high growth opportunity and firms with low growth opportunity, Gaver and Gaver (1993) and Graham et al. (1998) confirm that companies facing more growth options, defined by the market-to-book ratio, are those with less fixed claims in their balance sheet including lease financing. In contrast, Barclay and Smith (1995) note a positive relationship between firms' leasing commitments and growth opportunities. Similarly, and in a UK context, Beattie et al. (2000b) find a positive correlation between a firm's expected growth and its level of leasing, particularly off-

balance sheet leasing. Graham et al. (1998) anticipate that the propensity to use operating lease financing increases with the size of the fixed assets in a firm's balance sheet.

Sharpe and Nguyen (1995) argue that smaller firms with higher information asymmetry are more likely to use operating lease financing due to difficulties in accessing conventional debt funding. In this context, the main theoretical driver underpinning a firm's use of off-balance sheet lease financing would be the information asymmetry as the firm knows the real extent of its off-balance sheet leasing liabilities whereas investors, creditors and financial statement users will have to estimate this value based on reported minimum lease payments in the notes to the financial statement.[4] Using evidence from UK companies, Beattie et al. (2000b) find a negative, but weak significance between a firm's operating lease liabilities and its size demonstrating that small firms are more likely to lease. More recently, Eisfeldt and Rampini (2009) support the existence of a negative relationship between firms' propensity to lease and firm size, cash flow, and dividend pay-outs. In fact, their model predicts that large firms with smaller cash flow and dividend pay-outs will lease more reflecting difficulties in raising cash internally. Eisfeldt and Rampini (2009) suggest that while financially constrained firms will opt for operating leases in order to increase their debt capacity and preserve their capital, firms with better economic perspectives decrease their operating lease commitments in favour of secured debt financing.

Another relevant factor that determines firms' willingness to lease is the operational flexibility of this type of contract that is related to the ease of the collateral relocation. An exception to this argument occurs when the capital subject to the leasing contract is specific. Given the assumption that a firm's level of research and development expenditures increases with asset specificity, Eisfeldt and Rampini (2009) note a negative relationship between collateral and the propensity to rely on operating leases.

[4] To test this motive, one could explore the "valuation effect" (for instance, using Tobin's Q classification) for a sample of firms with different levels of operating lease commitments.

2.4 Data and methodology

2.4.1 Sample selection

Our study sample contains 161 FTSE 350 firms observed from 2000-2016.[5] We remove financial firms and utilities due to differences in reporting standards (Beattie et al. 1998; Dhaliwal, Lee, and Neamtiu, 2011; Cornaggia et al., 2013; Dogan, 2016). UK accounting regulations require firms to disclose information regarding future minimum lease payments in the notes to the financial statement (IAS17 leases). This information is collected manually following the selection process detailed in Table 2.1. Additional accounting and financial data is retrieved from DataStream.[6] Furthermore, for fiscal years ending before January 15th (inclusive), DataStream accounts for results of non-U.S. firms as the previous year's results. For example, a non-U.S. company with a fiscal year ending on the January 2, 2008 has its results classified as 2007 results. In our sample, only two companies have a fiscal year ending before January 15. When merging data collected manually from the annual reports and financial data collected from DataStream, we adjusted for DataStream guidance by coding the correspondent observations as t-1.

Table 2-1 Sample selection

Initial Sample	**All firms listed in the FTSE350 index**
Number of firms after exclusion of financial institutions and utility firms	252
Firms with no annual reports available on FAME archives, firms that are mainly lessors, or firms with no disclosure relative to operating leases	(82)
Firms with no data available on DataStream	(9)
Final Sample	**161**

[5] Data on firms' operating lease liabilities was manually collected from firms' annual reports accessed through FAME archives in Early January 2017. The start and the end of the sample period, years 2000 and 2016, reflects the earliest, and the latest, point of data available through FAME archives.
Firms selected are firms surviving until 2016, therefore it is important to account for survivorship bias as a robustness check as the study might understate the importance of the relationship between firms' use of off-balance sheet financing and financial distress. Further extension of the study should reconsider the sample collection process and account for firms that have dropped out of the sample between the years 2000 and 2016.

[6] See Appendix A.1 for a description of the study variables.

2.4.2 Variables and model definition

2.4.2.1 Measuring operating lease liabilities

To estimate operating lease liabilities, the extant financial and accounting literature reports three main approaches: the factor method, the capitalisation of non-cancellable minimum lease payments, and the lagged value of the minimum lease payment due in the first year of the lease's contract life (Imhoff, Lipe and Wright, 1993, 1997; Graham et al., 1998; Cornaggia et al., 2013; Paik, Van der Lann Smith, Lee, and Yoon, 2015; Dogan, 2016).

The factor method, also known as Moody's multiple method, is used in practice by financial analysts and consists of multiplying the current annual rental expense by a constant term in order to estimate the total value of operating lease liabilities (Ely, 1995; Beattie, Goodacre, and Thomson, 2000a; Lim et al., 2017). Prior studies find that factors 8 and 6 are the most commonly used in the U.S. context, while factor 8 is the most recurrent in the UK (Ely, 1995; Beattie et al., 2000a). However, this approach has the disadvantage of giving only an approximate value that tends to overestimate off-balance sheet leasing (Imhoff et al., 1993; Beattie et al., 2000a).[7]

The capitalisation of non-cancellable minimum lease payments method, proposed by Graham et al. (1998), estimates firms' operating lease liabilities as the sum of a firm's current rent expense and the capitalisation for the next five years of the future minimum lease payments discounted at 10%. This approach, similar to the procedure used by Imhoff, Lipe and Wright (1991), takes into account the minimum lease payment in each of the next five years, while Graham et al. (1998) capitalisation procedure ignores operating leases lasting beyond five years. Cornaggia et al. (2013) argue that this capitalisation methodology underestimates firm's off-balance sheet liabilities in terms of operating leases. In addition, the operating lease capitalisation method is based on commitments disclosed in the notes to the financial statement which report only non-cancellable leases and thus has been shown to underestimate the actual value of firms' operating lease

[7] It is important to acknowledge that in practice; a different approach is used assuming that operating leases are in place in perpetuity. This approach taken by Tim Koller (McKinsey) would lead to higher values for capitalised operating leases.

expenses by eliminating the possibility of lease contract renewal (Eisfeldt and Rampini, 2009; Lim et al., 2017).

Finally, Sharpe and Nguyen (1995), and more recently Dogan (2016), estimate the value of firms' off-balance sheet leasing as the lagged next year minimum lease payment disclosed in the notes of the financial statement adjusted for firms' total assets. When compared to Graham et al.'s (1998) methodology, this approach has the advantage of being free of assumptions with regard to the discount rate. However, ignoring minimum lease payments due after one year on the lease contract would result in an underestimation of the effect of off-balance sheet leasing on a firm's valuation.

The studies cited above exclusively analyse operating leases in the U.S. market. In terms of information disclosure relative to firms' operating lease commitments, differences between U.S. and UK accounting standards present a number of disparities with regard to the measurement of operating leases. U.S. accounting legislation requires the lessee to release information relative to the minimum lease payment for each of the next five years and an additional value of the payments relative to operating lease obligations lasting beyond five years (Statement of Financial Accounting Standards No. 13). However, in respect to the current UK accounting legislation, the Financial Reporting Council (FRC) requires the lessee to disclose future operating lease commitments for three periods: under one year, between one and five years, and beyond five years.[8] Beattie et al. (1998) and later Beattie et al. (2000a) develop an estimation of capitalised operating leases adapted to the UK accounting disclosure requirement. Their capitalisation method takes into account estimates of the remaining period of lease payments by due date and asset category. Applying this procedure to the current chapter produced inaccurate results for the following reasons. First, the accounting information retrieved by Beattie et al. (1998) is based on SSAP 21 (ASC, 1984) where the lessee is required to publish the next year's minimum operating lease commitment relative to three expiring date categories (i.e., operating lease contracts expiring in one year, between two and five years inclusive, and after five years). However, our operating lease sample is based on the IAS17 requirements where operating lease commitments are published as liabilities due in less

[8] Section 20, paragraph 20.16, FRS 102 The Financial Reporting Standard is applicable in the UK and Republic of Ireland.

than one year (within the "one year" category) and aggregate future operating lease commitments due between the first and the fifth year (inclusive) and after five years from the balance sheet date. In addition, in Beattie et al. (1998), the remaining lease life estimates are calculated by the category of the leasing asset. However, from 2003, the majority of the firms in our sample do not publish operating leasing commitments by asset category making the use of Beattie et al. (1998) remaining lease life estimates less applicable.

Thus, to estimate the amount of operating lease liabilities brought into the balance sheet, we adopt the Graham et al. (1998) capitalisation of minimum lease payments method. We define the variable OL_{it} as the sum of current operating lease rentals and the sum of the present value of the minimum lease payments expiring in one year and between two and five years, respectively. Following the same authors, we use a discount rate of 10%. Since operating lease commitments collected from annual reports after 2003 correspond to aggregate data as opposed to annual data (i.e., before 2003 International Accounting Standard 17 revised version), we annualise the value of the minimum lease payments expiring between one and five years by dividing the aggregate reported minimum lease payment by the total lease life (i.e., 5 years). Then, this annual value is capitalised over the remaining lease life for this category (i.e., 4 years). Thus, for each company *i* observed in year *t*, the counterpart of the operating lease liabilities following Graham et al. (1998) is:

$$OL_{it} = Current_{Exp} + \frac{MLP_1}{(1+Kd)} + \sum_{t=1}^{4} \frac{MLP_{1-5}}{(1+Kd)^t} \quad (1)$$

where OL_Graham_{it} is the estimated amount of operating lease liabilities for firm *i*, $Current_{Exp}$ is a firm's *i* operating lease current rent expense, MLP_1 is the firms' operating lease commitments expiring in one year, and $MLP_{1\text{-}5}$ is the annual minimum lease payment due between one and five years. Finally, *Kd* is the discount rate or cost of capital that is equal to 10%. The discount rate applied is in line with the literature on operating lease capitalisation (Imhoff et al., 1991, 1993; Imhoff et al., 1997; Beattie et al., 1998;

Beattie et al., 2000a, 2000b; Demerjian, 2011).[9] However, compared to the procedure proposed by Beattie et al. (1998), this proxy has the disadvantage of providing an underestimated value of firms' operating leases as it ignores minimum lease payments expiring after five years. As a robustness test, we consider additional regressions using Moody's factor method and Dogan's (2016) method as proxies for operating lease commitments.

2.4.2.2 Model definitions

2.4.2.2.1 Graham et al. (1998) leasing model

We follow Graham et al. (1998) and estimate a leasing model for a panel of 161 UK companies observed from 2000-2016. In their methodology, Graham et al. (1998) refer to a pooled Ordinary Least Square regression (OLS). However, this regression method potentially suffers from a methodological issue as the parameter estimates could be affected by an omitted variable bias if there is a time invariant component or a fixed effect within the entity that is correlated with the outcome variables and that is not measured by the explanatory variables (Arellano, 2003; Hsiao, 2003; Greene, 2008).[10] When analysing how firms choose their capital structure, Lemmon et al. (2008) demonstrate that a firm's leverage is primarily explained by a firm specific component that is largely misspecified in previous capital structure models. Thus, Lemmon et al.'s (2008) results suggest that firms' leverage ratios exhibit a time-invariant characteristic that researchers must control for when studying firms' capital structure. Cornnagia et al. (2013) extended this methodology to conventional leasing models by including a fixed effects component to the Graham et al. (1998) model. In this chapter, we follow Cornaggia et al. (2013) by including a fixed effects component to Graham et al.'s (1998) conventional leasing model expressed in Equation (2.1).[11]

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[9] The rationale for using a 10% discount rate is that it is the most commonly used discount rate in practice. It represents the sum of a 5% cost of debt before tax and another 5 % representing the depreciation cost relative to leasing the asset over a period of 20 years

[10] A fixed effects or time invariant component refers to a characteristic specific to the entity, a UK listed company in our study, not reflected in the set of the explanatory variables. By adding fixed effects regressions, the constant term is replaced by an individual or specific component allowing each observed company to have its own or specific intercept (Greene, 2008). Lemmon et al. (2008) refer to time-invariant factors, such as differences in managerial behaviour or market power, that represent a fixed effects characteristic as they are unobserved, specific, and relatively constant over time.

[11] To determine whether a random or fixed effects regression is more appropriate for our study sample, we perform a Hausman test where the null hypothesis is that the random effect specification is more suitable

Equation (2.1) illustrates the determinants of operating leases following Graham et al. (1998). In Equations (2.2) and (2.3), we control for firm and year fixed effects following Cornaggia et al. (2013).

$$\mathrm{OL_{it}} = \beta_0 + \beta_{1it}\mathrm{Tax_{it}} + \beta_{2it}\mathrm{Distress_{it}} + \beta_{3it}\mathrm{Zscore\_mod_{it}} + \beta_{4it}\mathrm{Neg\_OE_{it}} + \beta_{5it}\mathrm{MTB\_adj_{it}} + \beta_{6it}\mathrm{Coll_{it}} + \beta_{7it}\mathrm{Size_{it}} + \varepsilon_{it} \quad (2.1)$$

$$\mathrm{OL_{it}} = \beta_0 + \beta_{1it}\mathrm{Tax_{it}} + \beta_{2it}\mathrm{Distress_{it}} + \beta_{3it}\mathrm{Zscore\_mod_{it}} + \beta_{4it}\mathrm{Neg\_OE_{it}} + \beta_{5it}\mathrm{MTB\_adj_{it}} + \beta_{6it}\mathrm{Coll_{it}} + \beta_{7it}\mathrm{Size_{it}} + \mathrm{YearFE_t} + \varepsilon_{it} \quad (2.2)$$

$$\mathrm{OL_{it}} = \beta_{1it}\mathrm{Tax_{it}} + \beta_{2it}\mathrm{Distress_{it}} + \beta_{3it}\mathrm{Zscore\_mod_{it}} + \beta_{4it}\mathrm{Neg\_OE_{it}} + \beta_{5it}\mathrm{MTB\_adj_{it}} + \beta_{6it}\mathrm{Coll_{it}} + \beta_{7it}\mathrm{Size_{it}} + \mathrm{YearFE_t} + \mathrm{FirmFE_i} + \varepsilon_{it} \quad (2.3)$$

The dependent variable OL_{it} represents firm *i*'s operating lease commitments expressed as the ratio between the firm's total operating leases and the firm's total value, Tax_{it} is the company income tax rate, $Distress_{it}$ is a proxy of the firm's expected cost of distress, and $Zscore\_mod_{it}$ represents a modified version of Altman's (1968) z-score that does not include the market-to-book ratio as it is already used in the main leasing model to control for investment opportunities (Graham et al., 1998; Cornnagia et al., 2013). Furthermore, Neg_OE_{it} is a dummy variable that takes a value of one if the book value of the firm's common equity is negative and zero otherwise, MTB_adj_{it} represents the company market-to-book ratio adjusted for operating leases, and $Coll_{it}$ is the ratio between the firm's net property, plant, and equipment and total assets. Finally, $Size_{it}$ is measured as the company's market value.[12] β_0 and ε_{it} are, respectively, the model intercept and the error term. The error term ε_{it} is assumed to be heteroskedastic and correlated within

for the model. The Hausman test identifies whether the individual error terms are correlated with the explanatory variables. In our analysis, we reject the null hypothesis of the Hausman test with a p-value of less than 1%. Thus, a fixed effects model is more appropriate for our analysis.

[12] We consider the natural logarithm of a given variable if the variable in question is not normally distributed.

firms. Appendix A.1 represents the definition and formulas of the variables used in the Graham et al. (1998) model. In Equations (2.2) and (2.3), we control for a time fixed effect that absorbs changes related to the observed years that could affect the outcome variable (Lemmon et al., 2008). Thus, $YearFE_t$ is the time fixed effect of each year *t*. In Equation (2.3), we replace the constant term by firm fixed effects allowing each observed company *i* to have its own intercept. Accordingly, $FirmFE_i$ represents the unknown intercept or fixed effect of each firm *i*.

Based on previous results (Lewellen et al., 1976; Miller and Upton, 1976; Myers et al., 1976; Franks and Hodges, 1978; Brealey and Young, 1980; Lewis and Schallheim, 1992; Graham et al., 1998), we test, in our model, whether firms with low tax rates are more likely to use operating leases. Thus, we define the variable Tax as the ratio between income taxes and pre-tax income expressed in percentage terms. In Equation (2.1), the variables $Distress_{it}$, $Zscore\_mod_{it}$, and Neg_OE_{it} are measures of a firm's exposure to financial distress. Previous studies report a positive relationship between a firm's leasing commitments and its probability of bankruptcy (Krishnan and Moyer, 1994; Barclay and Smith, 1995; Eisfeldt and Rampini, 2009). This is explained by the fact that leasing contracts are paid in priority compared to conventional debt in the case of a company's insolvency, as well as having an ability to repossess the underlying collateral. Consistently, Graham et al. (1998), as well as Krishnan and Moyer (1994), find a positive correlation between leasing and proxies for financial constraints.

The variable $Coll_{it}$ accounts for a company's asset specificity. Contracting costs theories argue that companies with less specific and more liquid assets are more likely to have lower costs of external funding making leasing contracts more attractive (McConnell and Schallheim, 1983; Smith and Wakeman, 1985). This is particularly the case for operating lease contracts as demonstrated by Gavazza (2010) in the case of the aircraft industry. Firms with less specific assets are more likely to opt for lease financing thereby seeking greater financial flexibility. Finally, the financial literature emphasises the relevance of a firm's size to explain a firm's decision to lease. Small firms are more likely to have greater leasing commitments due to difficulties in accessing capital through traditional channels (Beattie et al., 2000b, Graham et al., 1998)

2.4.2.2.2 Measuring abnormal operating lease commitments

Following Cornnagia et al. (2013), we define abnormal operating leases as the difference between the observed firms' operating leases and the expected operating leases estimated following Graham et al.'s (1998) leasing model. Equation (3) defines the abnormal operating lease activity for a company *i* observed at year *t* (AOL_{it}), where OL_{it} represents the observed operating leases calculated following the Graham et al. (1998) capitalisation method and $E(OL_{it})$ is the expected off-balance sheet leasing estimated following the Graham et al. (1998) leasing model. $E(OL_{it})$ accounts for the level of operating leases expected by theoretical leasing models.

$$AOL_{it} = OL_{it} - E(OL_{it}) \quad (3)$$

2.4.2.2.3 Lemmon et al.'s (2008) capital structure model

In order to provide a better understanding as to why firms opt for off-balance sheet financing, we analyse the relationship between operating lease use and debt financing. The mainstream literature establishes a negative relationship between leasing and debt suggesting that leasing and debt are partial substitutes (Myers et al., 1976; Lewis and Schalheim, 1992). By considering a measure of leases that accounts for both finance and operating leases, Beattie et al. (2000b) argue that leases and debt are substitutes. Contradicting these results, recent studies suggest a positive and significant relationship between debt and the use of lease financing (Eisfeldt and Rampini, 2009; Rauh and Sufi, 2012; Cornaggia et al., 2013). Furthermore, other studies indicate that firms will accept extensive transaction costs in order for the leasing contract to qualify as an operating lease even if the economic determinants of the decision to use operating leases compared to traditional debt are not significant (Zechman, 2010; Schallheim et al., 2013). Thus, the accounting treatment of operating leases under IAS17 could be a determining factor in firms' financing policies.

In the current chapter, we refer to the Lemmon et al. (2008) capital structure model in order to analyse the relationship between firms' level of debt and their off-balance sheet commitments. For comparison purposes, we define Equation (4.1) and Equation (4.2) as

in the Lemmon et al. (2008) specification. Specifically, we control for firms' fixed effects in Equation (4.2). However, following Lemmon et al. (2008), as well as Cornaggia et al. (2013), we exclude the variable *Initial_Levit* from the fixed effects specification as it presents the same characteristic as the fixed effects component for time-invariance. Compared to traditional models of capital structure, the specifications in Equations (4.2) and (4.4) have the advantage of accounting for firms' time-invariant or fixed effects elements.[13]

In Equations (4.3) and (4.4) and following Cornaggia et al. (2013), we add abnormal operating lease *AOLit* as an explanatory variable in the Lemmon et al. (2008) capital structure model. The variable *AOLit* accounts for determinants that influence firms' operating lease commitments, but are not explained by traditional leasing models in the Graham et al. (1998) model. The estimation coefficient of interest is *yit* as the study seeks to analyse the relationship between a firm's level of debt and their abnormal operating leases as defined by Cornaggia et al. (2013). This relationship provides indications whether the off-balance sheet nature of operating leases is a determining factor in firms' financing decisions.

$$\begin{aligned}\text{Leverage}_{it} = {} & \beta_0 + \beta_{1it}\text{Initial}_{\text{Lev}_{it}} + \beta_{2it}\text{Sales}_{it} + \beta_{3it}\text{MTB}_{it} + \beta_{4it}\text{Prof}_{it} \\ & + \beta_{5it}\text{Tang}_{it} + \beta_{6it}\text{Ind}_{\text{Lev}_{it}} + \beta_{7it}\text{volatility}_{it} + \text{YearFE}_t + \varepsilon_{it}\end{aligned} \tag{4.1}$$

$$\begin{aligned}\text{Leverage}_{it} = {} & \beta_{1it}\text{Sales}_{it} + \beta_{2it}\text{MTB}_{it} + \beta_{3it}\text{Prof}_{it} + \beta_{4it}\text{Tang}_{it} \\ & + \beta_{6it}\text{Ind\_Lev}_{it} + \beta_{7it}\text{volatility}_{it} + \text{YearFE}_t + \text{FirmFE}_i + \varepsilon_{it}\end{aligned} \tag{4.2}$$

[13] Most traditional models of capital structure refer to a pooled OLS regression in order to estimate leverage ratios (Anderson, Mansi, and Reeb, 2003; Frank and Goyal, 2009; Sun, Ding, Guo, and Li, 2016). Lemmon et al. (2008) argue that these models suffer from an omitted variable bias and, as a consequence, provide spurious coefficient estimates.

$$\begin{aligned}\text{Leverage}_{it} = {} & \beta_{0} + \beta_{1it}\text{Initial Lev}_{it} + \beta_{2it}\text{Sales}_{it} + \beta_{3it}\text{MTB}_{it} + \beta_{4it}\text{Prof}_{it} \\ & + \beta_{5it}\text{Tang}_{it} + \beta_{6it}\text{Ind\_Lev}_{it} + \beta_{7it}\text{volatility}_{it} + \text{YearFE}_{t} \\ & + \gamma_{it}\text{AOL}_{it} + \varepsilon_{it}\end{aligned} \tag{4.3}$$

$$\begin{aligned}\text{Leverage}_{it} = {} & \beta_{1it}\text{Sales}_{it} + \beta_{2it}\text{MTB}_{it} + \beta_{3it}\text{Prof}_{it} + \beta_{4it}\text{Tang}_{it} \\ & + \beta_{5it}\text{Ind\_Lev}_{it} + \beta_{6it}\text{volatility}_{it} + \text{YearFE}_{t} + \text{FirmFE}_{i} \\ & + \gamma_{it}\text{AOL}_{it} + \varepsilon_{it}\end{aligned} \tag{4.4}$$

Note that in Equation (4.3), we do not control for firm fixed effects. Thus, we base the calculation of abnormal operating leases on the Graham et al. (1998) leasing model that only controls for year fixed effects [Equation (2.2)]. However, in Equation (4.4), we estimate both year and firm fixed effects. As such, we used Equation (2.3) in the Graham et al. (1998) leasing model in order to measure expected or theoretical operating leases.

2.4.3 Descriptive statistics

Table 2.2 presents the summary statistics of the study variables. Panel A reports the main statistics of the variables used in the Graham et al. (1998) leasing model. On average, operating lease commitments (*OL*) represent about 5% of a firm's total value. The median value of operating leases is about 3%. This difference between the mean and median value indicates a large dispersion of the sample observations.[14] This value is in line with

[14] A large dispersion of the sample observations indicates heterogeneity among the observed firms in terms of off-balance sheet leasing use. In that case, a quantile regression analysis is recommended to highlight the differences between firms with low operating lease commitments compared to firms with high operating

prior US studies reporting a similar level of operating leases as a ratio of firms' value (Graham et al., 1998; Cornaggia et al., 2013). For instance, Cornaggia et al. (2013) report that operating leases of US firms between the years 1980 and 2007 represent, on average, 5.9 % of firms' total assets. In addition, Table 2.2 shows a symmetric distribution of the firms' tax rate (*Tax*) with a mean (median) of 27% (27%). The same symmetric distribution is also reported for the firms' size. The average operating leases account for about 29% of fixed claims. Moreover, observed firms have a low expected cost of financial distress (*Distress*) with less than 3% frequency of reported negative common equity (*Neg_OE*). However, following Altman's (1968) "zones of discrimination," the firms in our sample are, on average, classified as "grey" (Z-score mean = 1.97). Panel B presents the descriptive statistics of the variables used in the Lemmon et al. (2008) model.

lease commitments. Applying this methodology to the Graham et al. (1998) model shows no differences in terms of the qualitative interpretation of the results (see Appendix B).

Table 2-2 Summary Statistics

	N	Mean	Median	Standard Deviation
Panel A: Graham et al. (1998) Model				
OL	2080	0.054	0.026	0.072
Tax	2080	0.266	0.269	0.302
Distress	2076	0.063	0.013	0.204
Zscore_mod	2081	1.975	1.835	1.071
Neg_OE	2081	0.030	0.000	0.171
MTB_adj	2080	2.201	1.586	2.552
Coll	2080	0.287	0.212	0.251
Size	2081	14.267	14.055	1.487
Panel B: Lemmon et al. (2008) Model				
Leverage	1933	12.551	2.213	1.946
Initial_Lev	1994	11.852	2.514	1.946
Sales	2081	14.105	1.529	8.408
MTB	2077	0.632	0.162	-0.215
Prof	1988	-1.999	0.621	-6.908
Tang	2080	-1.815	-1.551	1.356
Ind_Lev	2080	12.544	12.441	0.635
Volatility	2081	11.341	11.147	1.444

Notes. In this table, we provide the summary statistics for a sample of 161 UK firms listed in the FTSE350 index and observed from 2000-2016. Panel A illustrates the summary statistics of the variables used in the Graham et al. (1998) leasing model. *OL* is the ratio between the present value of operating lease commitments and a firm's total firm value, *Tax* represents a company's income tax divided by the pre-tax income, *Distress* is the ex-ante cost of financial distress, *Zscore_mod* is a modified version of Altman's (1968) Z score that does not take into account the market-to-book-ratio, *Neg_OE* is a dummy variable that takes a value of one if the book value of firm's common equity is negative and zero otherwise, *MTB_adj* represents the company market-to-book ratio adjusted for operating leases, and *Coll* is the ratio between a firm's net property, plant, and equipment and total assets. Finally, *Size* is measured as the logarithm of company *i*'s market value. Panel B reports the summary statistics of the Lemmon et al. (2008) variables. *Leverage* is the ratio between a firm's total debt and total assets. *Initial_Lev* represents the first non-missing value of the variable leverage. Variables *Sales* and *MTB* represent the logarithm of a firm's total sales and its market-to-book ratio, respectively. *Prof* is the value of a company's EBITDA divided by its total assets. *Tang* is the ratio between net PPE and total assets. *Ind_Lev* is the industry median leverage. Finally, *Volatility* is the standard deviation of operating income divided by total assets.

2.4.4 Methodological issues

As the current study refers to panel regression analysis in order to analyse UK operating lease activity, we address three main potential methodological issues: the presence of multicollinearity, the heteroskedasticity of the variance of error terms, and serial correlation.

First, the correlation matrix of the independent variables (Table 2.3) indicates that pairwise correlation coefficients are low for most of the variables except in the case of Sales and *Intial_Lev* (0.619), volatility and *Initial_Lev* (0.609), and volatility and Sales (0.753).[15] However, variance inflation factors for the three variables indicate a value below the critical value of five that is used as a reference in most empirical models (Greene, 2008).[16] In a second step, we consider a heteroskedasticity test that examines whether the variance of the error term is constant. A Wald test indicates the presence of heteroskedasticity of the error term. Finally, we follow Drukker (2003) and Wooldridge (2010) in order to test for the presence of serial correlation. Applying Drukker's (2003) test to our dataset for Equations (2.1)-(2.3), as well as Equations (4.1)-(4.4), indicates the presence of a serial correlation of the error term within our panel data. The error terms are correlated over time or across clusters. Thus, to account for the presence of both heteroskedasticity and serial correlation, we employ a panel GLS (generalised least squares regression).

[15] We consider two variables as highly correlated if their correlation coefficient is higher than 0.50.
[16] Appendix A.4 and A.5 present variance inflation factors (VIF) for both Graham et al.'s (1998) and Lemmon et al.'s (2008) models.

Table 2-3 Correlation Matrix

	Tax	Distress	Zscore_mod	NegOE	MTB	Coll	size
Panel A: Graham et al.'s (1998) leasing model							
Tax	1.000						
Distress	0.107	1.000					
Zscore_mod	0.042	0.341	1.000				
NegOE	0.048	0.078	-0.132	1.000			
MTB	0.041	0.401	0.315	0.133	1.000		
Coll	-0.082	-0.076	-0.132	0.021	-0.131	1.000	
size	-0.103	-0.337	-0.116	-0.009	0.252	0.044	1.000
Panel B: Lemmon et al.'s (2008) capital structure model.							
	Initial_Lev	Sales	MTB	Prof	Tang	Ind_Lev	volatility
Initial_Lev	1.000						
Sales	0.619	1.000					
MTB	0.177	-0.165	1.000				
Prof	-0.121	-0.128	-0.047	1.000			
Tang	0.198	0.069	0.190	0.127	1.000		
Ind_Lev	0.264	0.353	0.096	0.051	0.307	1.000	
volatility	0.609	0.753	0.041	-0.055	0.025	0.283	1.000

Notes. This matrix table represents the correlation coefficients of the variables. Panel A reports the Graham et al. (1998) leasing model correlation matrix. *Tax* represents a company's income tax divided by pre-tax income, *Distress* is the ex-ante cost of financial distress, *Zscore_mod* is a modified version of Altman's (1968) Z score that does not take into account the market-to-book-ratio, *Neg_OE* is a dummy variable that takes a value of one if the book value of a firm's common equity is negative and zero otherwise, *MTB_adj* represents the company's market-to-book ratio adjusted for operating leases, and *Coll* is the ratio between a firm's net property, plant, and equipment and total assets. Finally, *Size* is measured as the logarithm of company *i*'s market value. Panel B illustrates the correlation coefficients of the explanatory variables of the Lemmon et al. (2008) capital structure model. *Initial_Lev* represents the first non-missing value of the variable leverage. Variables *Sales* and *MTB* represent the logarithm of a firm's total sales and its market-to-book ratio, respectively. *Prof* is the value of a company's EBITDA divided by its total assets. *Tang* is the ratio between net PPE and total assets. *Ind_Lev* is the industry median leverage. Finally, *Volatility* is the standard deviation of operating income divided by total assets.

2.5 Empirical results

2.5.1 Time series analysis of UK firms' off-balance sheet leasing

In order to analyse UK firms' activity regarding off-balance sheet lease financing, we begin by examining the time series trend of operating leases for a sample of 161 UK firms listed in the FTSE 350 Index. The choice of the FTSE 350 Index is motivated by the need to represent large and medium sized firms based on their market capitalisation.

Figure 1 illustrates the evolution of operating leases of UK firms from 2000-2016 following the Graham et al. (1998) capitalisation method. This graph depicts a steady increase in the observed companies' off-balance sheet leasing commitments with the value of capitalised operating leases in 2015 representing 2.3 times the firms' operating leases in 2000.[17] In addition, the same graph indicates a sharp increase in the firm's operating leases in 2016 of about 1.5 times the total commitment in 2015. This increase of off-balance sheet leasing is consistent with Cornaggia et al. (2013) who find a significant positive trend of U.S. operating leases form 1980-2007.[18]

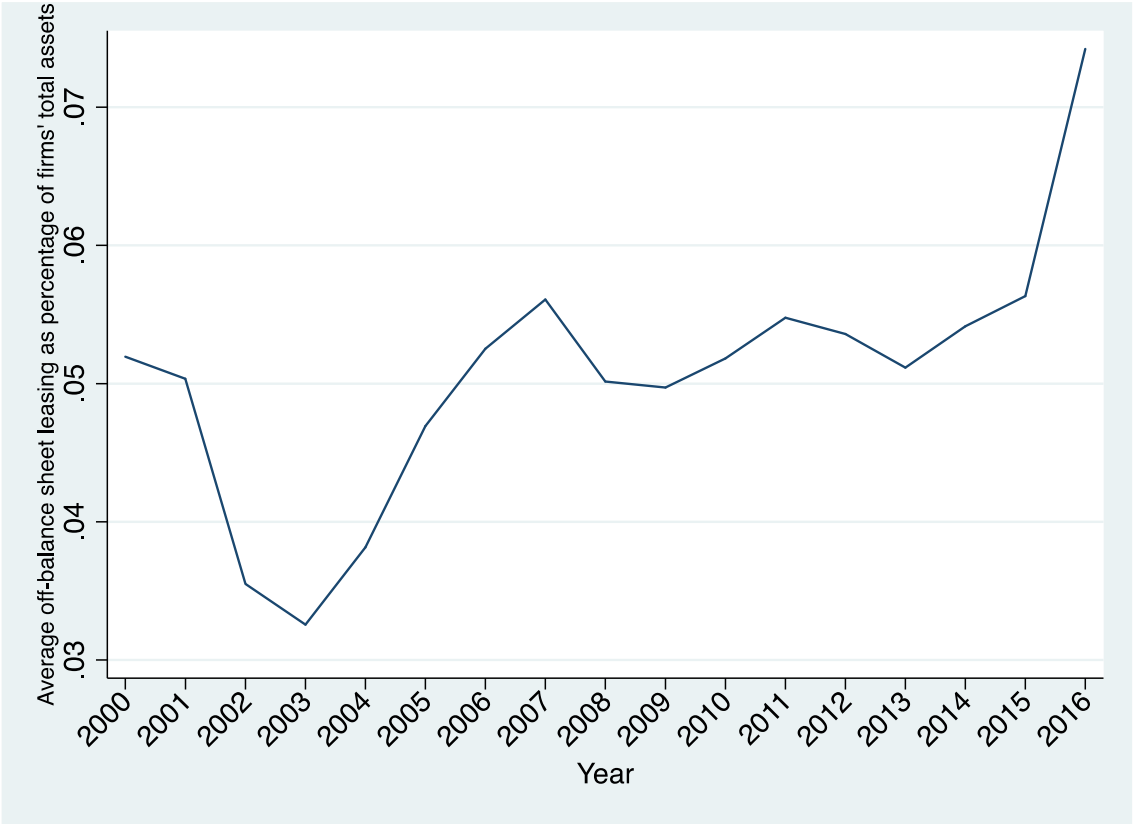
2.5.2 Multivariate analysis of the determinants of operating lease activity

In Table 2.4, we present the multivariate analysis of operating lease determinants. Models 1-3 correspond to the Generalised Least Square regression results of the Graham et al. (1998) leasing model as defined in Equations (2.1)-(2.3). In contrast to Graham et al. (1998) and Cornaggia et al. (2013), we did not find a significant relationship between a firm's operating lease activity and its corporate tax rate. Beattie et al. (2000b) notes a similar result by demonstrating that tax rates are not significant when explaining the leasing activity of UK firms from 1990-1994.

[17] The same time series trend is observed using other proxies of firms' operating lease commitments (see Figures 2 and 3 in Appendix A.2).

[18] Appendix A.3 provides a table with the regression analysis results for operating lease trends. This table shows a significant positive trend. This result is in line with Cornaggia et al. (2013) who find a significant trend among U.S. firms off-balance sheet leasing.

Figure 1 Average off-balance sheet leasing



Notes. This figure plots the annual averages of operating leases as percentage of total assets, for a total of 161 UK firms from 2000-2016. We express average operating leases relative to firm value to account for firms' size effects over the sample time period. Firms' operating lease commitments are computed following the Graham et al. (1998) capitalisation method. For each company *i* observed in year *t*, the counterpart of operating lease liabilities following Graham et al. (1998) is: $OL\_Graham_{it} = Current_{Exp} + \frac{MLP_1}{(1+Kd)} + \sum_{t=1}^{4} \frac{MLP_{1-4}}{(1+Kd)^t}$ where OL_Graham_{it} is the estimated amount of operating lease liabilities for firm *i*, MLP1 is the firms' operating lease commitments expiring in one year, and MLP1-4 is the annual minimum lease payment due between one and five years. Finally, *Kd* is the discount rate or cost of capital set equal to 10%.

In addition, this study's results are in line with theories that predict a positive relationship between firms' financial constraints and their operating lease activity (Sharpe and Nguyen, 1995; Eisfeldt and Rampini, 2009; Lim et al., 2017, Dogan, 2016). Eisfeldt and Rampini (2009) argue that when compared to traditional debt financing, the ability to repossess collateral makes leasing more attractive for financially constrained firms. In line with Eisfeldt and Rampini's (2009) theoretical predictions, our study determines that more distressed firms are more likely to opt for leasing. Both variables *Distress* and *Zscore_mod* have a significant positive effect on firms' operating leases. The results in Table 2.4 indicate a positive and significant relationship between firms' ex-post costs of insolvency as measured by *Zscore_mod*, as well as its ex-ante costs of financial distress

(*Distress*) and the level of operating lease liabilities suggesting that firms with weaker financial strength are more likely to use operating leases.

In accordance with models of capital structure that predict firms with more collateral on their financial statements are more likely to issue debt or leases, our study highlights a positive and significant relationship between operating leases and collateral. This result is in accordance with most U.S. empirical studies and is explained by the fact that firms with more fixed assets in their balance sheet should, ceteris paribus, issue more lease contracts in order to finance those fixed assets needs (Eisfeldt and Rampini, 2009; Rampini and Viswanathan, 2013, Graham et al., 1998). However, our result contradicts Beattie et al. (2000b) who did not find a significant relationship between operating leases and asset collateral using a sample of UK firms.

Prior studies suggest that firms with more growth options in their investment opportunity set have a lower propensity to lease advocating a negative relationship between firms' investment opportunity sets and their operating lease commitments (Myers, 1977; Graham et al., 1998, Cornaggia et al, 2013). Table 2.4 indicates that firms with greater investment opportunities as measured by the *MTB_adj* ratio have a lower propensity to lease. The variable *MTB_adj* ratio has a significant negative impact on firms' off-balance sheet leasing. Finally, Model 1 in Table 2.4 reports that small firms exhibit greater operating lease commitments when compared to large firms. This result is consistent with most empirical papers that suggest small firms are more likely to access operating leases compared to traditional debt financing due to greater flexibility (Sharpe and Nguyen, 1995; Eisfeldt and Rampini, 2009; Cornaggia et al., 2014; Dogan, 2016; Lim et al., 2017).

Models 2 and 3 in Table 2.4 correspond to the regression results of Equations (2.2) and (2.3). Consistent with Cornaggia et al. (2013), we only account for firm fixed effects (Model 2) and firm and year fixed effects (in Model 3). As reported by Table 2.4, the significance and signs of the model variables are maintained.

Table 2-4 Multivariate analysis of the determinants of operating leases

	Model 1	**Model 2**	**Model 3**
Tax	0.00703	-0.00202	0.00693
	(0.69)	(-0.25)	(0.91)
Distress	0.101***	0.0722***	0.0580***
	(6.42)	(4.36)	(3.44)
Zscore	0.164***	0.0792***	0.0634***
	(6.53)	(4.39)	(3.60)
NegOE	0.0671	0.0334	-0.00636
	(1.57)	(1.26)	(-0.27)
MTB	-0.925***	-0.982***	-0.832***
	(-26.60)	(-36.84)	(-25.79)
Coll	0.162***	0.0703***	0.131***
	(7.94)	(3.11)	(5.35)
Size	-0.0884***	-0.0562***	-0.161***
	(-5.61)	(-3.42)	(-8.24)
Mining	-0.764	-0.872*	-0.669
	(-0.75)	(-1.95)	(-1.51)
Construction	-0.115	-0.227	-0.102
	(-0.11)	(-0.50)	(-0.23)
Manufacturing	-0.00197	-0.854*	-0.817*
	(-0.00)	(-1.89)	(-1.82)
Transportation	1.415	0.668	0.922**
	(1.38)	(1.44)	(2.05)
Communication	0.608	1.119**	1.168***
	(0.59)	(2.49)	(2.62)
Electricity, Gaz, Sanitary Services	0.389	0.340	0.523
	(0.38)	(0.76)	(1.18)
Retail Trade	1.004	1.676***	1.588***
	(0.98)	(3.64)	(3.54)
Services	0.672	0.110	0.156
	(0.66)	(0.23)	(0.33)
Public Administration	0.317	0.0407	0.160
	(0.30)	(0.08)	(0.32)
Constant	-1.663		
	(-1.61)		
FIRM FE	no	yes	yes
YEAR FE	no	no	yes
R^2	0.4529	0.8617	0.8690
N	1917	1917	1917

Notes. This table illustrates the results of the multivariate analysis of the determinants of firms' operating lease commitments. The sample contains 161 UK firms listed in the FTSE 350 Index from 2000-2016. The dependent variable is defined following the Graham et al. (1998) capitalisation method and represents the ratio of a firm's operating lease commitments divided by total firm value. The independent variables are *Tax*, which represents company's income tax divided by pre-tax income and *Distress,* which is the ex-ante cost of financial distress. *Z_score_mod* is a modified version of Altman's (1968) Z score that does not take into account the market-to-book ratio. *Neg_OE* is a dummy variable that takes a value of one if the book value of a firm's common equity is negative and zero otherwise. *MTB_adj* represents the company's market-to-book ratio adjusted for operating leases. *Coll* is the ratio between a firm's net property, plant, and equipment and total assets. Finally, *Size* is measured as the logarithm of company *i*'s market value. Model (1) represents a pooled OLS regression. Models (2) and (3) replace the constant term with firm fixed effects. In addition, Model (3) replaces the time dummies with a year fixed effect. t-statistics are in parentheses. * p<0.10, ** p<0.05,

and *** p<0.01

2.5.3 Operating leases and a firm's capital structure

Using the Lemmon et al. (2008) capital structure model, we analyse the relationship between the abnormal leasing activity of UK firms and their level of debt in Table 2.5. All variables maintain the same sign regardless as to the specification adopted (Models 4-7). In accordance with empirical studies on firms' capital structure (Lemmon et al., 2008; Frank and Goyal, 2009), we found a positive relationship between firms' leverage and their level of sales and tangibility of the underlying asset. Consistent with Frank and Goyal (2009), our results indicate a negative relationship between firms' book leverage and profitability.

More central to our study goals, Table 2.5 indicates a negative relationship between firms' level of debt and their abnormal operating leases. This result suggests active management of a firm's leverage by keeping the amount of traditional debt low, which is on-balance sheet by definition and increasing off-balance sheet commitments through operating leases.

Moreover, one could argue that firms with less ability to access traditional debt and lower free cash flows use operating lease financing to increase their debt capacity. In order to investigate this relationship, we first subdivide the sample observations into three categories based on Altman's (1968) "zones of discrimination" (Table 2.6). The category "distressed" regroups firms with a Z score lower than 1.80, the category "grey" considers firms with a Z score between 1.80 and 2.99, and the category "safe" corresponds to firms with a Z score higher than 2.99. Interestingly, Table 2.6 indicates that when accounting for firms' free cash flow constraints, the negative relationship between firms' level of debt and abnormal operating leases reported in the Lemmon et al. (2008) model (Table 5) is maintained only for the "distressed" category. Additionally, we subdivide our sample into firms with low and high free cash flow constraints (Table 2.7). In accordance with our predictions, firms with low free cash flow constraints have significantly lower levels of abnormal operating leases.

Firms with high free cash flow constraints use off-balance sheet lease financing to increase their debt capacity. This is consistent with the view that the accounting treatment of operating leases is a significant determinant of a firm's leasing activity.

Table 2-5 Abnormal operating leases and firms' capital structure

	Model 4	**Model 5**	**Model 6**	**Model 7**
AOL			-0.0520***	-0.0589***
			(-2.97)	(-3.54)
Initial_Lev	0.391***		0.368***	
	(18.64)		(17.65)	
Sales	0.528***	0.893***	0.562***	0.921***
	(19.50)	(26.10)	(20.40)	(26.26)
MTB	2.469***	2.747***	2.552***	2.762***
	(17.50)	(19.56)	(16.97)	(18.69)
Prof	-0.184***	-0.250***	-0.228***	-0.291***
	(-9.74)	(-13.33)	(-9.61)	(-12.58)
Tang	0.110***	-0.00363	0.131***	-0.0140
	(5.21)	(-0.14)	(5.72)	(-0.39)
Ind_Lev	-0.0453	-0.938***	-0.0295	-0.988***
	(-1.27)	(-8.46)	(-0.81)	(-8.75)
Volatility	0.161***	0.392	0.160***	0.344
	(6.02)	(1.55)	(5.90)	(1.31)
Firm FE	no	yes	no	yes
Year FE	yes	yes	yes	yes
Chi2	4028.31	3937.87	4327.16	3895.29
Prob>Chi2	0.0000	0.0000	0.0000	0.0000
N	1827	1845	1706	1724

Notes. This table reports the regression results of the Lemmon et al. (2008) capital structure model. Following Cornaggia et al. (2013), we add abnormal operating lease as an additional explanatory variable to test the relationship between companies' off-balance sheet leasing commitments and their level of debt. The dependent variable is the ratio between a firm's total debt and total assets. Explanatory variables are the firms' Initial leverage that represents the first non-missing value of the variable leverage. *Sales* and *MTB* represents the logarithm of a firm's total sales and its market-to-book ratio, respectively. Profitability is the value of a company's EBITDA divided by its total assets. *Tangibility* is the ratio between net PPE and total assets. *Industry_Leverage* is the industry median leverage. *CF_Volatility* is the standard deviation of operating income divided by total assets. Finally, *AOL* is the abnormal operating lease activity not explained by theoretical leasing determinants. It is measured as the difference between the observed and the expected operating lease commitments. Note that in Model 6, we do not control for firm fixed effects. We base the calculation of abnormal operating leases on Graham et al. (1998) that only controls for year fixed effects. However, because Model 7 controls both for year and firm fixed effects, in order to measure expected or theoretical operating leases, we refer to the Graham et al. (1998) leasing model that controls for both year and firm fixed effects. t-statistics are in parentheses. * p<0.10, ** p<0.05, and *** p<0.01.

Table 2-6 Abnormal operating leases and firms' financial distress

	Full Sample	**Distressed**	**Grey**	**Safe**
AOL	-0.0589***	-0.0698***	0.0158	-0.210
	(-3.54)	(-8.05)	(0.57)	(-1.54)
Sales	0.921***	0.961***	1.211***	1.235***
	(26.26)	(27.88)	(21.48)	(4.88)
MTB	2.762***	2.249***	2.694***	5.777***
	(18.69)	(14.53)	(12.76)	(5.01)
Prof	-0.291***	-0.201***	-0.230***	0.193
	(-12.58)	(-7.89)	(-5.15)	(1.10)
Tang	-0.0140	-0.0480	-0.0139	1.169***
	(-0.39)	(-1.45)	(-0.34)	(3.62)
Ind_Lev	-0.988***	-0.714	18.49***	-0.876***
	(-8.75)	(-1.40)	(2.70)	(-2.61)
Volatility	0.344	0.356**	-6.447***	0.274
	(1.31)	(2.07)	(-2.78)	(0.44)
Firm FE	yes	yes	yes	yes
Year FE	yes	yes	yes	yes
Chi2	3895.29	5101.32	2775.53	170.55
Prob>Chi2	0.0000	0.0000	0.0000	0.0000
N	1724	798	706	196

Notes. The dependent variable is the ratio between a firm's total debt and total assets. Explanatory variables *Sales* and *MTB* represent the logarithm of a firm's total sales and its market-to-book ratio, respectively. *Prof* is the value of a company's EBITDA divided by its total assets. *Tang* is the ratio between net PPE and total assets. *Ind_Lev* is the industry median leverage. *Volatility* is the standard deviation of operating income divided by total assets. Finally, *AOL* is the abnormal operating lease activity not explained by theoretical leasing determinants. It is measured as the difference between the observed and the expected operating lease commitments. Based on Altman's (1968) "zones of discrimination," we divide our sample into three categories: the category "Distressed" regroups firms with Altman's Z-score lower than 1.80, the group "Grey" considers firms with a Z-score between 1.80 and 2.99, and the category "Safe" corresponds to firms with a Z-score higher than 2.99. t-statistics are in parentheses. * p<0.10, ** p<0.05, and *** p<0.001.

Table 2-7 Abnormal operating leases and cash flow constraints

	Full Sample	**High FCF**	**Low FCF**
AOL	-0.0589***	-0.00734	-0.0617***
	(-3.54)	(-0.36)	(-2.69)
Sales	0.921***	0.835***	1.073***
	(26.26)	(19.03)	(29.79)
MTB	2.762***	2.903***	2.499***
	(18.69)	(16.37)	(14.35)
Prof	-0.291***	-0.337***	-0.427***
	(-12.58)	(-9.77)	(-14.97)
Tang	-0.0140	0.0860*	-0.173***
	(-0.39)	(1.86)	(-3.60)
Ind_Lev	-0.988***	-0.811***	-1.236***
	(-8.75)	(-7.18)	(-4.19)
Volatility	0.344	0.261	0.883***
	(1.31)	(1.11)	(3.06)
Firm FE	yes	yes	yes
Year FE	yes	yes	yes
Chi2	3895.29	2792.12	2585.49
Prob>Chi2	0.0000	0.0000	0.0000
N	2044	1031	1013

Notes. The dependent variable is the ratio between a firm's total debt and total assets. Explanatory Variables *Sales* and *MTB* represent the logarithm of a firm's total sales and its market-to-book ratio, respectively. *Prof* is the value of a company's EBITDA divided by its total assets. *Tang* is the ratio between net PPE and total assets. *Ind_Lev* is the industry median leverage. *Volatility* is the standard deviation of operating income divided by total assets. Finally, *AOL* is the abnormal operating lease activity not explained by theoretical leasing determinants. It is measured as the difference between the observed and the expected operating lease commitments. To account for firms' cash flow constraints, we first calculate FCF (free cash flow) as the income from operations net of capital expenditures and cash dividends paid. Then, we divide the sample into high FCF and low FCF based on the median (Lim et al., 2017; Zechman, 2010; Barry, Mann, Mihov, and Rodriguez, 2008). T-statistics are in parentheses. * p<0.10, ** p<0.05, and *** p<0.001.

2.5.4 Robustness checks

In order to assess the validity of our findings, we conduct a series of robustness checks and additional regression analysis. First, we consider the dependent variable of the Graham et al. (1998) leasing model defined in Equation (1) and relax the assumption of the discount rate *Kd* by estimating the results based on 3% and 6% discount rates. Table 2.8 indicates the multivariate regression results of the Graham et al. (1998) leasing model using 3% and 6% discount rates for calculating the dependent variable OL_{it} . Table 2.8 indicates that our results are not sensitive to the level of the discount rate used in the operating lease capitalisation calculations. The results are qualitatively similar to those previously discussed in Table 2.4.

Table 2-8 Robustness test 1: Sensitivity analysis to the choice of the discount rate

	Discount rate=3%			Discount rate=6%			Discount rate=10%		
Tax	0.00545	-0.00250	0.00771	0.00467	-0.00306	0.00699	0.00703	-0.00202	0.00693
	(0.55)	(-0.31)	(1.00)	(0.48)	(-0.37)	(0.90)	(0.69)	(-0.25)	(0.91)
Distress	0.0876***	0.0784***	0.0661***	0.0878***	0.0792***	0.0656***	0.101***	0.0722***	0.0580***
	(5.43)	(4.64)	(3.79)	(5.47)	(4.69)	(3.78)	(6.42)	(4.36)	(3.44)
Zscore-mod	0.170***	0.0792***	0.0586***	0.170***	0.0808***	0.0614***	0.164***	0.0792***	0.0634***
	(6.51)	(4.32)	(3.26)	(6.55)	(4.40)	(3.40)	(6.53)	(4.39)	(3.60)
NegOE	0.0806*	0.0374	-0.00258	0.0802*	0.0387	-0.00367	0.0671	0.0334	-0.00636
	(1.78)	(1.34)	(-0.10)	(1.78)	(1.37)	(-0.15)	(1.57)	(1.26)	(-0.27)
MTB_adj	-0.902***	-0.985***	-0.831***	-0.903***	-0.990***	-0.832***	-0.925***	-0.982***	-0.832***
	(-24.85)	(-36.77)	(-25.16)	(-25.04)	(-37.00)	(-25.29)	(-26.60)	(-36.84)	(-25.79)
Coll	0.171***	0.0781***	0.140***	0.171***	0.0756***	0.140***	0.162***	0.0703***	0.131***
	(8.38)	(3.44)	(5.60)	(8.37)	(3.34)	(5.60)	(7.94)	(3.11)	(5.35)
Size	-0.106***	-0.0489***	-0.155***	-0.106***	-0.0492***	-0.157***	-0.0884***	-0.0562***	-0.161***
	(-6.21)	(-2.96)	(-7.80)	(-6.23)	(-2.98)	(-7.89)	(-5.61)	(-3.42)	(-8.24)
Mining	-0.775	-0.886**	-0.671	-0.777	-0.890**	-0.676	-0.764	-0.872*	-0.669
	(-0.74)	(-2.01)	(-1.48)	(-0.74)	(-2.02)	(-1.50)	(-0.75)	(-1.95)	(-1.51)
Construction	-0.0409	-0.245	-0.121	-0.0443	-0.254	-0.125	-0.115	-0.227	-0.102
	(-0.04)	(-0.54)	(-0.26)	(-0.04)	(-0.56)	(-0.27)	(-0.11)	(-0.50)	(-0.23)
Manufacturing	-0.000524	-0.870*	-0.829*	-0.00777	-0.872*	-0.833*	-0.00197	-0.854*	-0.817*
	(-0.00)	(-1.95)	(-1.81)	(-0.01)	(-1.96)	(-1.82)	(-0.00)	(-1.89)	(-1.82)
Transportation	1.463	0.632	0.894*	1.458	0.623	0.889*	1.415	0.668	0.922**
	(1.41)	(1.38)	(1.94)	(1.40)	(1.36)	(1.94)	(1.38)	(1.44)	(2.05)
Communication	-0.169	1.073**	1.123**	-0.154	1.078**	1.130**	0.608	1.119**	1.168***
	(-0.16)	(2.42)	(2.47)	(-0.14)	(2.43)	(2.49)	(0.59)	(2.49)	(2.62)
Electricity, Gaz, Sanitary Services	0.331	0.334	0.525	0.318	0.325	0.518	0.389	0.340	0.523
	(0.32)	(0.76)	(1.17)	(0.30)	(0.74)	(1.16)	(0.38)	(0.76)	(1.18)
Retail Trade	1.053	1.644***	1.549***	1.055	1.641***	1.546***	1.004	1.676***	1.588***
	(1.01)	(3.61)	(3.38)	(1.01)	(3.61)	(3.38)	(0.98)	(3.64)	(3.54)

Services	0.744	0.102	0.144	0.738	0.0920	0.134	0.672	0.110	0.156
	(0.72)	(0.21)	(0.30)	(0.71)	(0.19)	(0.28)	(0.66)	(0.23)	(0.33)
Public Administration	0.371	-0.0102	0.103	0.370	-0.00672	0.110	0.317	0.0407	0.160
	(0.35)	(-0.02)	(0.20)	(0.35)	(-0.01)	(0.22)	(0.30)	(0.08)	(0.32)
Firm FE	no	yes	yes	no	yes	yes	no	yes	yes
Year FE	no	no	yes	no	no	yes	no	no	yes
N	1917	1917	1917	1917	1917	1917	1917	1917	1917

Notes. In this table, we provide a sensitivity analysis of the Graham et al. (1998) leasing model to a variation of the discount rate used in the estimation of operating lease commitments. The dependent variable represents the ratio of a firm's operating lease commitments divided by total firm value. The independent variables are *Tax,* which represents a company's income tax divided by pre-tax income, *Distress*, which is the ex-ante cost of financial distress, and *Zscore_mod* is a modified version of Altman's (1968) Z score that does not take into account the market-to-book ratio. *Neg_OE* is a dummy variable that takes a value of one if the book value of a firm's common equity is negative and zero otherwise. *MTB_adj* represents the company's market-to-book ratio adjusted for operating leases. *Coll* is the ratio between a firm's net property, plant, and equipment and total assets. Finally, *Size* is measured as the logarithm of company *i*'s market value. t-statistics are in parentheses. * p<0.10, ** p<0.05, and *** p<0.01.

Table 2-9 Robustness test 2: Exclusion of the retail sector

Panel A: Graham et al.'s (1998) leasing model				
		Model 1	Model 2	Model 3
Tax		0.00898	0.00344	0.0127
		(0.83)	(0.40)	(1.52)
Distress		0.0910***	0.0960***	0.0752***
		(5.33)	(5.31)	(4.06)
Zscore		0.160***	0.0979***	0.0880***
		(6.06)	(4.64)	(4.24)
NegOE		0.0408	0.00857	-0.0310
		(0.95)	(0.29)	(-1.07)
MTB		-0.950***	-0.932***	-0.818***
		(-25.55)	(-30.62)	(-21.99)
Coll		0.202***	0.0889***	0.113***
		(9.51)	(3.57)	(4.27)
Size		-0.0837***	-0.0890***	-0.159***
		(-5.13)	(-4.92)	(-7.06)
Firm FE		no	yes	yes
Year FE		no	no	yes
N		1577	1577	1577
Panel B: Lemmon et al.'s (2008) capital structure model				
	Model 4	Model 5	Model 6	Model 7
AOL			-0.0478**	-0.0686***
			(-2.43)	(-3.63)
Initial_Lev	0.384***		0.364***	
	(16.47)		(15.51)	
Sales	0.568***	0.892***	0.599***	0.909***
	(19.20)	(23.96)	(19.78)	(23.81)
MTB	2.599***	3.525***	2.639***	3.386***
	(15.99)	(21.36)	(15.54)	(19.37)
Prof	-0.187***	-0.255***	-0.239***	-0.282***
	(-9.16)	(-12.68)	(-9.07)	(-10.57)
Tang	0.107***	0.00181	0.125***	-0.0395
	(4.62)	(0.07)	(4.92)	(-1.01)
Ind_Lev	-0.0424	-0.939***	-0.0208	-0.981***
	(-1.18)	(-7.62)	(-0.57)	(-7.90)
Volatility	0.169***	0.243	0.173***	0.261
	(5.89)	(0.81)	(5.86)	(0.85)
Firm FE	no	yes	no	yes
Year FE	yes	yes	yes	yes
N	1488	1506	1385	1403

Notes. In Panel A, the dependent variable represents the ratio of a firm's operating lease commitments divided by total firm value. The independent variables are *Tax*, which represents a company's income tax divided by pre-tax income and *Distress* is the ex-ante cost of financial distress. *Zscore_mod* is a modified version of Altman's (1968) Z score that does not take into account the market-to-book ratio. *Neg_OE* is a dummy variable that takes a value of one if the book value of a firm's common equity is negative and zero otherwise. *MTB_adj* represents the company's market-to-book ratio adjusted for operating leases. *Coll* is the ratio between a firm's net property, plant, and equipment and total assets. Finally, *Size* is measured as the logarithm of company *i*'s market value. In Panel B, we recalculate the abnormal leasing activity based on the estimation results of Panel A. The dependent variable is the company level of leverage. Explanatory variables are firms' initial leverage representing the first non-missing value of the variable leverage. Variables *Sales* and *MTB* represent the logarithm of a firm's total sales and its market-to-book ratio, respectively. *Prof* is the value of a company's EBITDA divided by its total assets. *Tang* is the ratio between net PPE and total assets. *Ind_Lev* is the industry median leverage. *Volatility* is the standard deviation of operating income divided by total assets. Finally, *AOL* is the abnormal operating lease activity not explained by theoretical leasing determinants. It is defined as the difference between the observed and the expected operating lease commitments. t-statistics are in parentheses. * p<0.10, ** p<0.05, and *** p<0.01

Furthermore, the results previously reported in Table 2.4 indicate that the dummy variables of the retail sector have a significant positive impact on firms' operating leases. This result is in accordance with Goodacre (2010) who highlights the importance of operating lease commitments in the UK retail industry. Thus, as a robustness check, we test whether our results are industry specific or not by removing this sector from the sample and repeating the regression analysis. Table 2.9 provides the results of both the Graham et al. (1998) leasing model and the Lemmon et al. (2008) capital structure model after exclusion of the retail sector. As illustrated in Table 2.9, the variables significance and signs are maintained in majority.

The final robustness check considers other measures of firms' off-balance sheet commitments as stated in the literature (Lim et al, 2017; Sharpe and Nguyen, 1995; Dogan, 2016). We seek to test whether our results are sensitive to the use of the proxy of firms' operating lease commitments. First, in line with Dogan (2016), we define the variable *OL_Dogan*$_{it}$, which represents the lagged value of minimum operating lease payments due in one year, *MLP1*$_{it}$, adjusted for a company's total assets *TA*$_{it}$:

$$\mathrm{OL\_Dogan_{it}} = \frac{\mathrm{MLP1_{it}}}{\mathrm{TA_{it}}} \tag{5}$$

In a second step, for each company *i* observed from 2000-2016, we consider the variable *OL_Moody*$_{it}$ calculated as follows:

$$\mathrm{OL\_Moody_{it}} = 8 * \mathrm{Current\_Exp_{it}} \tag{6}$$

With *Current_Exp*$_{it}$ representing the company's operating lease current rent expenses. In Table 2.10, we estimate both the Graham et al. (1998) leasing model and the Lemmon et al. (2008) capital structure model following Dogan's (2016) proxy of operating leases. In Table 2.11, we repeat the same analysis using Moody's factors, defined in Equation (6), to estimate firms' operating lease activity. Overall, the results reported in Tables 2.10 and 11 show that our findings are robust to the method used to estimate firms' operating lease liabilities.

Table 2-10 Robustness test 3: Using Dogan's (2016) measure of operating leases

Panel A: Graham et al. (1998) leasing model			
	Model 1	Model 2	Model 3
Tax	0.00323	-0.0592***	-0.00110
	(0.15)	(-4.55)	(-0.11)
Distress	0.0904***	0.0166	0.0782***
	(3.36)	(0.99)	(3.02)
Zscore	0.277***	0.229***	0.147***
	(4.87)	(6.63)	(3.72)
NegOE	0.224**	0.320***	0.0233
	(2.12)	(3.25)	(0.25)
MTB	0.207***	-0.332***	0.479***
	(2.97)	(-5.33)	(8.98)
Coll	0.0466	-0.258***	0.143***
	(1.23)	(-4.96)	(3.22)
Size	0.00555	0.298***	-0.395***
	(0.21)	(7.91)	(-10.01)
Mining	-0.539	-1.283**	0.0949
	(-0.53)	(-2.26)	(0.24)
Construction	-0.316	0.102	0.397
	(-0.33)	(0.19)	(1.00)
Manufacturing	0.251	-0.337	-0.153
	(0.27)	(-0.64)	(-0.37)
Transportation	1.954**	0.785	1.754***
	(2.06)	(1.40)	(4.40)
Communication	0.766	1.695***	1.675***
	(0.80)	(3.41)	(4.51)
Electricity, Gaz, Sanitary Services	0.734	0.282	1.437***
	(0.77)	(0.53)	(3.53)
Retail Trade	1.086	2.253***	1.066**
	(1.14)	(3.25)	(1.99)
Retail Trade	1.086	2.253***	1.066**
	(1.14)	(3.25)	(1.99)
Services	0.840	-0.672	-0.806
	(0.89)	(-1.03)	(-1.50)
Public Administration	0.365	0.365	0.667*
	(0.37)	(0.66)	(1.67)
Firm FE	no	yes	yes
Year FE	no	no	yes
N	1766	1766	1766

Panel B: Lemmon et al. (2008) capital structure model				
	Model 4	Model 5	Model 6	Model 7
AOL			-0.0325***	-0.0295***
			(-3.49)	(-3.60)
Initial_Lev	0.391***		0.307***	
	(18.64)		(17.62)	
Sales	0.528***	0.893***	0.563***	0.893***
	(19.50)	(26.10)	(22.03)	(23.37)
MTB	2.469***	2.747***	2.448***	2.535***
	(17.50)	(19.56)	(16.40)	(16.81)
Prof	-0.184***	-0.250***	-0.273***	-0.298***
	(-9.74)	(-13.33)	(-10.97)	(-12.98)
Tang	0.110***	-0.00363	0.179***	-0.0411
	(5.21)	(-0.14)	(8.84)	(-1.13)
Ind_Lev	-0.0453	-0.938***	0.00475	-0.931***
	(-1.27)	(-8.46)	(0.14)	(-7.80)
Volatility	0.161***	0.392	0.219***	0.489*
	(6.02)	(1.55)	(9.41)	(1.80)
Firm FE	no	yes	no	yes
Year FE	yes	yes	yes	yes
N	1827	1845	1571	1589

Notes. In this table, we test the sensitivity of our results to the variables used to measure firms' operating lease commitments. In Panel A, we replace the dependent variable of the Graham et al. (1998) leasing model with the ratio of the lagged value of the minimum operating lease payments due in one year, MLP_{it-1} and firms' total assets, TA_{it}, as defined by Dogan (2016). The explanatory variables are *Tax_rate*, which represents a company's income tax divided by pre-tax income and *Distress* is the ex-ante cost of financial distress. *Z_score_mod* is a modified version of Altman's (1968) Z score that does not take into account the market-to-book ratio. *Neg_OE* is a dummy variable that takes a value of one if the book value of a firm's common equity is negative and zero otherwise. *MTB_adj* represents the company's market-to-book ratio adjusted for operating leases. *Coll* is the ratio between a firm's net property, plant, and equipment and total assets. Finally, *Size* is measured as the logarithm of company *i*'s market value. In Panel B, we recalculate the abnormal leasing activity based on the estimation results of Panel A. The dependent variable is the company's level of leverage. Explanatory variables are the firms' initial leverage, which represents the first non-missing value of the variable leverage. Variables *Sales* and *MTB* represent the logarithm of a firm's total sales and its market-to-book ratio, respectively. *Profitability* is the value of a company's EBITDA divided by its total assets. *Tangibility* is the ratio between net PPE and total assets. *Industry_Lev* is the industry median leverage. *Volatility* is the standard deviation of operating income divided by total assets. Finally, *AOL* is the abnormal operating lease activity not explained by theoretical leasing determinants. It is defined as the difference between the observed and the expected operating lease commitments. t-statistics are in parentheses. * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.01$

Table 2-11 Robustness test 4: Using Moody's factor as proxy of operating leases.

Panel A: Graham et al. (1998) leasing model			
	Model 1	Model 2	Model 3
Tax	0.0200	-0.00514	0.0180**
	(1.64)	(-0.94)	(2.54)
Distress	0.0194	-0.0427***	-0.0463***
	(1.27)	(-2.76)	(-3.96)
Zscore_mod	0.0766***	-0.0191	-0.0466***
	(2.64)	(-1.18)	(-2.68)
NegOE	0.223***	0.174***	0.0638**
	(3.88)	(7.57)	(2.14)
MTB_adj	-1.142***	-0.856***	-0.549***
	(-32.27)	(-29.22)	(-15.78)
Coll	0.208***	0.0141	0.0940***
	(9.77)	(0.56)	(3.52)
Size	0.717***	0.547***	0.329***
	(44.08)	(30.81)	(15.65)
Mining	-0.708	-0.0511	0.452
	(-0.66)	(-0.10)	(0.91)
Construction	0.200	0.346	0.540
	(0.19)	(0.70)	(1.09)
Manufacturing	0.247	-0.389	-0.237
	(0.23)	(-0.77)	(-0.47)
Transportation	1.393	2.083***	2.605***
	(1.30)	(4.02)	(5.17)
Communication	0.520	2.318***	2.465***
	(0.48)	(4.55)	(4.81)
Electricity, Gaz, Sanitary Services	0.919	1.357***	1.790***
	(0.85)	(2.71)	(3.59)
Retail Trade	1.413	1.842***	1.629***
	(1.32)	(3.58)	(3.22)
Services	0.745	1.262**	1.436**
	(0.70)	(2.13)	(2.50)
Public Administration	0.678	1.449**	1.700***
	(0.62)	(2.40)	(2.81)
Firm FE	no	yes	yes
Year FE	no	no	yes
N	1917	1917	1917

Panel B: Lemmon et al. (2008) capital structure model				
AOL			0.00388	-0.0102
			(0.28)	(-0.80)
Initial_Lev	0.391***		0.367***	
	(18.64)		(17.53)	
Sales	0.528***	0.893***	0.549***	0.917***
	(19.50)	(26.10)	(19.90)	(25.14)
MTB	2.469***	2.747***	2.591***	2.816***

	(17.50)	(19.56)	(17.16)	(19.23)
Prof	-0.184***	-0.250***	-0.229***	-0.294***
	(-9.74)	(-13.33)	(-9.59)	(-12.80)
Tang	0.110***	-0.00363	0.140***	-0.0128
	(5.21)	(-0.14)	(6.09)	(-0.35)
Ind_Lev	-0.0453	-0.938***	-0.0352	-0.982***
	(-1.27)	(-8.46)	(-0.96)	(-8.53)
Volatility	0.161***	0.392	0.174***	0.341
	(6.02)	(1.55)	(6.43)	(1.26)
Firm FE	no	yes	no	yes
Year FE	yes	yes	yes	yes
N	1827	1845	1706	1724

Notes. This table presents the robustness analysis of our results to the variables used to measure firms' operating lease commitments. In Panel A, we replace the dependent variable of Graham et al.'s (1998) leasing model with Moody's factor estimates defined as $OL\_Factor_{it} = 8 * Current\_Exp_{it}$ where *Current_Exp* represents the current operating lease rental expense. The explanatory variables are *Tax,* which represents a company's income tax divided by pre-tax income and *Distress* is the ex-ante cost of financial distress. *Z_score_mod* is a modified version of Altman's (1968) Z score that does not take into account the market-to-book ratio. *Neg_OE* is a dummy variable that takes a value of one if the book value of a firm's common equity is negative and zero otherwise, *MTB_adj* represents the company's market-to-book ratio adjusted for operating leases. *Coll* is the ratio between a firm's net property, plant, and equipment and total assets. Finally, *Size* is measured as the logarithm of company *i*'s market value. In Panel B, we recalculate the abnormal leasing activity based on the estimation results of Panel A. The dependent variable is the company level of leverage. Explanatory variables are the firms' *Initial_Lev*, which represents the first non-missing value of the variable leverage. Variables *Sales* and *MTB* represent the logarithm of a firm's total sales and its market-to-book ratio, respectively. Profitability is the value of a company's EBITDA divided by its total assets. Tangibility is the ratio between net PPE and total assets. *Ind_Lev* is the industry median leverage. *Volatility* is the standard deviation of operating income divided by total assets. Finally, *AOL* is the abnormal operating lease activity not explained by theoretical leasing determinants. It is defined as the difference between the observed and the expected operating lease commitments. t-statistics are in parentheses. * p<0.10, ** p<0.05, and *** p<0.01

In summary, our results indicate that cash constrained firms and firms with weaker financial strength have greater off-balance sheet operating lease commitments. This result is consistent with Beatty et al.'s (2010) findings that indicate a greater propensity for off-balance sheet leasing for firms with poor financial reporting quality.

Further, our findings indicate a significant relationship between UK firms' corporate capital structure and the benefit of reporting operating leases off the balance sheet. This suggests that the accounting treatment of operating leases is a significant driver of UK firms' operating lease activity. Managers with cash constrained firms are more likely to preserve their reported leverage by keeping operating lease liabilities off the balance sheet. This could be indicative of the use of operating leases as an earnings management tool as demonstrated by Zechman (2010) in the case of synthetic leases.

2.6 Conclusion

The main objective of the current study was first to identify the motives underpinning the use of operating leases under IAS 17 leases. We investigate UK off-balance sheet leasing from 2000-2016 and what determinants are relevant in explaining this financing choice. In accordance with Beattie et al. (1998), we find that UK operating lease activity has significantly increased over the selected time frame. While we find no evidence supporting the tax incentive to use operating leases, our results suggest that firms' financial constraints, investment opportunity set, and size are significant determinants of their level of operating lease liabilities. Particularly, we find that smaller firms with a greater probability of insolvency have significantly more off-balance sheet lease commitments than larger firms.

In a second step, we investigate the current role of operating leases in corporate financing decisions. Accordingly, we examine the impact of off-balance sheet leasing on UK firms' capital structure. Following Cornaggia et al. (2013), we decompose the level of operating leases into predicted and abnormal components based on the Graham et al. (1998) leasing model. Our results are consistent with the existence of a negative and significant relationship between firms' level of debt and their abnormal operating lease activity. Further analysis indicates that this relationship is only significant for cash constrained firms with a high probability of financial distress. This result suggests that the accounting treatment of operating leases plays a significant role in explaining the substantial increase of off-balance sheet leases since 2000. Thus, for small firms with a higher cost of financial distress, the advantage of operating leases arises from its accounting treatment under IAS 17 leases. Particularly, our findings imply that the off-balance sheet treatment of operating leases under IAS 17 leases has facilitated access to financing for small companies without altering their level of on-balance sheet debt. Therefore, we relate to the corporate governance literature by supporting the relevance of financial distress in explaining firms' incentives to use off-balance sheet leasing.

Our study also provides insights regarding firms' incentives to use off-balance sheet leasing in light of the changes in international leasing accounting standards. We support the view that managers have previously taken advantage of loopholes within the leasing

accounting system in order to preserve their level of debt. This view is consistent with the fact that managers know how to exploit accounting loopholes by using operating lease agreements to carry out acquisitions without reporting additional debt and without affecting the level of debt reported on the balance sheet (Jamal and Tan, 2010).

Our findings are robust to the choice of the discount rate used to capitalise operating leases. In addition, the study results remain qualitatively the same using other commonly used proxies of operating lease commitments.

Chapter 3 Effect of targets' off-balance sheet leasing on the likelihood of unsuccessful M&A

3.1 Abstract

This chapter contributes to the ongoing academic literature exploring why major strategic decisions such as mergers and acquisitions fail. We investigate two aspects of M&A deal failure: failure of the deal negotiation, where an announced deal is subsequently terminated and failure to create value for shareholders after the merger deal is completed. We predict and find that the likelihood that a M&A deal is terminated after the announcement date increases significantly with target firms' off-balance sheet leasing magnitude prior to the deal announcement. We also find that this relationship is only significant for deals announced prior to 2009. Our findings suggest that the deteriorating trustworthiness of firms accounting information characterising the period prior to the Global Financial Crisis (GFC) as well as the opacity of accounting standards such as for operating leases contributed to the likelihood that M&A deals will be terminated. However, in contradiction with our predictions, after the merger deal is completed, we find that target firms' level of off-balance sheet leasing increases the acquirer post-acquisition performance. This suggests that acquiring a target firm with a great magnitude of off-balance sheet commitments increases the efficiency of the merger decision in the long term, possibly due to an increase of the merged entity debt capacity.

3.2 Introduction:

Operating leases, also referred to as off-balance sheet leasing, are defined as non-cancellable, long-term, fixed-cost claims with bankruptcy priority (Alexander et al., 2017).[19] As a consequence, operating leases or off-balance sheet leasing is fundamentally a form of conventional debt obligations. Under the previous International Accounting Standard 17 (IAS 17 leases) from a lessee perspective, only payments relative to the current rental expense are recognised in the company's financial statements. All future payments relative to operating leases are disclosed in the notes to the financial statement. This off-balance sheet treatment of operating leases has created a long controversy in the accounting literature. Many studies document that firms' use of operating leases has increased significantly suggesting that companies use operating leases as a form of off-balance sheet financing and a form of manipulation of financial statements (Beatty et al., 2010; Dechow, Ge, Larson, and Sloan, 2011; Cornaggia et al., 2013).

In the context of mergers and acquisitions (M&A's) of publicly listed companies, the first source used by the acquirer in order to assess the success of a potential deal is the target's publicly available accounting information, such as its off-balance sheet liabilities. In the context of leasing, the current study investigates to what extent the magnitude of off-balance sheet leasing affects M&A deals. We focus on two possible outcomes of the M&A deal process. First, based on the previous leasing accounting disclosure requirements, we investigate how acquiring firms incorporate information about targets' off-balance sheet leasing after the M&A deal is announced. Precisely, we investigate to what extent the magnitude of target firms' off-balance sheet leasing affects the likelihood that the announced deal is subsequently terminated before the completion date.[20] In a second step, we focus on M&A deals that are successfully completed and analyse how the magnitude of target firms' off-balance sheet leasing affects the post-acquisition value creation of the merged entity.

[19] The literature refers to operating leases and off-balance sheet leasing as synonyms. The latter denomination is more recurrent in the corporate finance literature (Cornaggia et al., 2013), while the former appellation is more frequent in the accounting literature (Beatty et al., 2010).

[20] We use the term M&A deal termination to describe an event of non-completion or withdrawal of the announced M&A deal.

Prior studies document the importance of accounting information and its quality in firms' investment decisions (Bushman and Smith, 2001; Biddle and Hilary, 2006; Biddle, Hilary, and Verdi, 2009). In the context of acquisition investment decisions, a more recent stream of the accounting literature examines the impact of target firms' accounting quality on post-acquisition profitability, as well as the M&A deal process (Raman, Shivakumar, and, Tamayo, 2013; Skaife and Wangerin, 2013; Marquardt and Zur, 2014; Mc Nichols and Stubben, 2015; Martin and Shalev, 2017). Beatty et al. (2010) find that the propensity to use off-balance sheet leasing is negatively correlated with firms' accounting quality. Building on Beatty et al. (2010), we examine whether target firms' off-balance sheet leasing affects post-acquisition performance. Skaife and Wangerin (2013) confirm that the likelihood that an announced M&A deal is ultimately terminated increases with the magnitude of off-balance sheet liabilities in the target firm's financial statements. We extend Skaife and Wangerin (2013) by investigating the impact of a specific and significant type of off-balance sheet liabilities (i.e. off-balance sheet leasing) on the probability that the announced M&A deal will go bust.

This chapter extends the previous studies by analysing another attribute of firms' accounting information, which is the existence and use of off-balance sheet leasing by target firms. We posit that target firms' off-balance sheet leasing levels are an important attribute of accounting information. Thus, taking target firms' off-balance sheet leasing into consideration is a potential determinant of the adequacy of the due diligence during the process of a target firm's valuation.

To assess firms' off-balance sheet leasing activity, we use three distinctive measures based on the future minimum operating lease payments disclosed in the companies' notes to the financial statement. First, we follow Graham et al. (1998) and estimate firms' off-balance sheet leasing commitments by capitalising future non-cancellable minimum lease payments. In addition, we follow Standard and Poors (S&P) methodology and estimate target firms' operating leases magnitude based on the capitalisation of future minimum lease payments including commitments due beyond the fifth year of the operating lease life. Finally, we measure target firms' off-balance sheet leasing using Moody's multiple that corresponds to the maximum value between the S&P estimate and the firm's current operating lease rental expense times a factor of eight. Our primary measure of target accounting quality is based on firms' discretionary accruals. We follow

Dechow, Sloan, and Sweeney (1995) and measure abnormal accruals from the modified Jones (1991) model.

We test our predictions using a sample of 1711 US domestic mergers and acquisitions deals announced between the years 1983 and 2018. Compared to other world regions, US companies are reporting the most significant levels of off-balance sheet leasing. Around 76% of US firms' leasing activity comes in the form of off-balance sheet leasing (IASB, 2016). This fact makes US domestic mergers and acquisitions an interesting empirical ground for our hypothesis testing.

We find that the likelihood that an announced M&A deal is subsequently terminated increases significantly with the target firm's off-balance sheet leasing commitments observed one year prior to the M&A deal announcement year. We extend Skaife and Wangerin (2013) by demonstrating that a specific type of off-balance sheet liability (i.e., off-balance sheet leasing) is significantly and positively related to the probability of M&A deal termination. Interestingly, our study demonstrates that this relationship is only significant in the pre-financial crisis period. This is in line with prior research that document a lack of transparency and a decreased trustworthiness of firms' accounting information that characterised the period preceding the Global Financial Crisis (GFC) and that partially triggered the global crisis of 2008 (Arnold, 2009). Therefore, by increasing the opacity of the target firm's valuation, we find that off-balance sheet leasing was a significant determinant of M&A deal termination prior to the GFC.

Contrary to our predictions, we find that if target firms' have a high magnitude of off-balance sheet leasing, M&A deals are more likely to create value after the acquisition. We attribute this result to our choice of post-acquisition performance measure. In fact, in line with Martin and Shalev (2017), we define acquirer post-acquisition performance as the difference between the acquirer return on assets one year after the acquisition and the acquirer and target combined return on assets one year before the acquisition.

However, prior studies determine that financial statement metrics, such as return on assets, are significantly altered in heavy leasing firms as the amount of reported assets is underestimated (Imhoff et al., 1991; Beattie et al., 1998; Cornaggia et al., 2013; Giner, Merello, and Pardo, 2019). Furthermore, our findings indicate that this relationship is only significant for M&A deals announced during the pre-financial crisis era. This result is in

accordance with Alexandridis, Antypas, and Travlos (2017) who find that contrary to the long standing view that M&As destroy value for the acquiring firm shareholders, the aftermath of the GFC was marked by a significant increase in M&A's efficiency.

Our results are of particular relevance for accounting standards setters and regulators. Using the context of acquisition investments decisions, we provide empirical evidence of the International Accounting Standard Board's statement that the new leasing regulations will improve firms' decision making by reducing opacity about companies' financial leverage (IASB, 2016).

The remainder of the chapter is presented as follows. Section 3.3 provides an overview of the research background and develops the study hypothesis. Section 3.4 and 3.5 present the study data and methodology. Section 3.6 presents the empirical results. Section 3.7 reports a discussion and further analysis of the study results. Finally, concluding remarks are provided in Section 3.8.

3.3 Research background and hypothesis development

3.3.1 Why does the magnitude of target operating leases matter in the context of M&A's?

Before developing our hypothesis, we first provide a brief overview as to why target firms' level of off-balance sheet leasing is likely to impact the likelihood that an announced M&A deal is eventually terminated or, in later stage, contributes to value destruction for the merged entity after the deal completion.

First, our study builds on Skaife and Wangerin (2013) who show that during the M&A due diligence process, the magnitude of off-balance sheet information in targets' financial statements is positively correlated with the likelihood that the announced M&A deal is subsequently terminated. Since operating leases are fundamentally a form of off-balance sheet debt, this study provides an empirical investigation regarding how the magnitude of off-balance sheet leasing affects the likelihood of M&A deal success.

In fact, under the old International Accounting Standard 17 (IAS 17 *leases*), only annual rental payments should be disclosed on a firm's financial statement. Minimum operating lease rental commitments due within five years are disclosed off-balance sheet in the notes to the financial statement. This specific accounting treatment lead to a significant

use of operating leases by companies seeking to benefit from off-balance sheet financing (Cornaggia et al., 2013).

There are two key studies that investigate the relationship between a firm's operating lease magnitude and its accounting quality. Beatty et al. (2010) find that a firm's accounting quality decreases with its propensity to use operating leases. Moreover, Dechow et al. (2011) report that the existence and use of operating leases is highly significant for companies prone to fraudulent accounting misstatement. Companies with a poor accounting quality reputation are more likely to use operating leases and have a greater magnitude of off-balance sheet leasing commitments. Interestingly and more central to our study, Dechow et al.'s (2011) measure of accounting accrual quality incorporates off-balance sheet information based on the existence and use of operating leases. Their findings indicate that firms identified by the SEC as chargeable of financial reporting misstatements exhibit a greater use of operating leases. In addition, they also find that an unusual increase in operating lease activity is significantly and positively associated with the misstatement of firms' financial statements. In line with Cornaggia et al. (2013), they determine that the accounting treatment of operating leases is a determining factor of firms' leasing activity and reflects managers' wish for accounting window dressing. In the specific context of corporate acquisitions, this chapter builds on Dechow et al. (2011) by investigating to what extent the magnitude of target off-balance sheet leasing affects the M&A deal process.

In addition, as one of the most important investment decisions faced by companies, M&A deal success, as well as the ability to create value for shareholders, is largely dependent on the quality of the information conveyed in the target's accounts (Raman et al., 2013; Skaife and Wangerin, 2013; Marquardt and Zur, 2014; Mc Nichols and Stubben, 2015; Martin and Shalev, 2017). Previous studies focus on target accounting quality as reflected by the financial statement opacity caused by real earnings management. However, little attention has been given to the impact of the target off-balance sheet activity on an M&A's deal success. Raman et al. (2013) argue that uncertainty arising from a target's valuation increases with their propensity to use earnings management, as well as the opacity of the target's financial statement created by off-balance sheet transactions. While providing evidence that bidders are more likely to undertake negotiated takeovers (i.e., friendly takeovers) when the target's earning management is of great concern,

Raman et al. (2013) do not identify to what extent target off-balance sheet activity influences the M&A process.

Finally, previous studies indicate that bringing operating leases onto the balance sheet significantly affects firms' financial metrics, particularly the leverage ratio (Imhoff et al., 1991; Beattie et al., 1998; Cornaggia et al., 2013; Giner et al., 2019). Therefore, the application of the new leasing accounting rules (IFRS 16 *leases*) will likely have a material impact on target firms' level of reported debt, which is a key input in M&A's valuation process. DePamphilis (2019) argues that evaluating a target's leverage ratio is a crucial step of the M&A's due diligence process. Thus, acquiring a highly levered target has a greater impact on the merged entity's total leverage and may endanger its credit rating and, as such, increasing its probability of insolvency.

In sum, since operating leases are a traditional type of off-balance sheet financing and 76% of U.S. companies' leasing activity comes in the form of operating leases (IASB, 2016), we posit that the magnitude of target firms' operating leases is an important attribute of the quality of a target's accounting information provided during the M&A due diligence process and is a significant determinant of the likelihood of the M&A deal's success. Cornaggia et al. (2013) report that a significant amount of U.S. companies' assets and liabilities are not reflected on the balance sheet due to the accounting treatment of operating leases. In this study, we investigate to what extent off-balance sheet leasing commitments affect the post-acquisition efficiency of the M&A decision.

3.3.2 Accounting information and the acquisition investment decision

One of the most reaffirmed facts in prior studies on post-acquisition value creation is that M&A's largely destroy value for the acquiring firm shareholders (Andrade, Mitchell, and Stafford, 2001; Moeller, Schlingemann, and Stulz, 2005). However, in the post-2009 era, Alexandridis et al. (2017) find a reverse of this trend with acquirers recording significant positive performance after the acquisition deal. Furthermore, Alexandridis et al. (2017) note that a determining factor of this reversal is the significant improvement in the quality of corporate governance during the post-2009 financial crisis period. In line with this fact, the new lease accounting standard reflects standard setter's efforts to improve corporate governance through better disclosure and accounting information quality (Kothari, 2019).

This chapter builds on previous studies that analyse the relationship between post-acquisition performance and firms' accounting quality. Considering various definitions and attributes of firms' accounting information quality, this branch of research documents a positive and significant relationship between the quality of firms' accounting practices and the ability of the M&A deal to generate value (Raman et al., 2013; Marquardt and Zur, 2014; Mc Nichols and Stubben, 2015; Martin and Shalev, 2017).

Studies analysing acquirers' accounting attributes find a positive association between the M&A's value creation and the acquirer's financial reporting conservatism (Francis and Martin, 2010; Kravet, 2014). Kravet (2014) argues that firms characterised by greater accounting conservatism are less likely to undergo risky acquisitions. The author defines risky acquisitions as M&A deals that generate an increase in the post-acquisition performance volatility of the combined entity. More central to our analysis, Kravet (2014) finds that managers of firms with conservative accounting have a greater probability to forgo acquisition investment opportunities that are more likely to increase the risk of breaching their debt covenants terms. Since Lim et al. (2017) determine that off-balance sheet leasing is advantageous in the sense of increasing firms' debt capacity without compromising its debt covenants, we extend both studies by analysing to what extent the level of the acquirer's off-balance sheet leasing affects post-acquisition performance.

One branch of the literature focuses on targets' accounting attributes and finds that the target's accounting quality is a significant determinant of the likelihood of the M&A's deal success (Raman et al., 2013; Mc Nichols and Stubben, 2015). Raman et al. (2013) argue that an M&A's deal is likely to be classified as hostile if the bidder is at greater risk of uncertainty regarding the target's financial statements. Thus, through negotiated deals, the acquirer mitigates the effect of information asymmetry by requiring more information about the target. Marquardt and Zur (2014) find a significant relationship between a targets' accounting quality and the merger deal process. They confirm that poor target accounting quality is greater for deals with a lengthy negotiation phase and deals with a greater likelihood of termination. Similarly, Skaife and Wangerin (2013) and Martin and Shalev (2017) indicate that the probability of post-acquisition gain is lower for firms with poor accounting quality and, more importantly, the probability of termination or divestiture after the deal completion is greater for poor accounting quality targets.

More recently, Chen, Collins, Kravet, and Mergenthaler (2018) find that when the target firm has higher financial statement comparability, the ability for the M&A deal to create value is greater. In fact, greater target financial statement comparability provides the acquiring firm with a better and richer set of information as to how the target performs compared to its competitors leading to a greater probability of success of the deal. This positive effect is more significant when the acquirer is at greater risk of information asymmetry before the completion of the deal. In this context, the acquiring firm will have greater reliance on the information set provided through comparable accounting to mitigate the effect of information asymmetry during the process of due diligence.

Chen et al. (2018) argue that financial statement comparability does not substitute for a target's accrual quality, but is complementary to the firm's accounting quality. Therefore, target financial statement comparability is an additional feature of firms' accounting quality.

However, after the announcement of an M&A deal, not all acquisitions successfully reach the completion stage. A proportion of announced deals will ultimately be terminated. Despite the occasional nature of this event, many studies look at the drivers underpinning M&A termination. Luo (2005) argues that M&A deals that result in a significant negative market reaction subsequent to the announcement date are more likely to be terminated. Martin and Shalev (2017) suggest that the availability of specific information about the target decreases the probability of deal termination occurring. This effect is more significant for within-industry acquisitions where the acquiring firm size is large compared to a small sized target firm. Skaife and Wangerin (2013) find that the probability of M&A termination increases with the low quality of the accounting information of the target firm and the existence of significant off-balance sheet liabilities. We extend those prior studies by conjecturing that subject to the quality of due diligence completed by the acquiring firm, the existence and magnitude of off-balance sheet leasing in the target accounting statements increases the likelihood of deal termination.

We extend previous studies by testing the following hypothesis. First, we posit that the probability of deal termination increases with target pre-acquisition off-balance sheet leasing. We expect the acquirer to be more likely to terminate the M&A deal if the M&A due diligence reveals a significant amount of off-balance sheet leasing as this will increase

the uncertainty regarding the target's true valuation leading to a greater probability that the announced M&A deal will ultimately be terminated. In addition, in the case where the announced M&A deal is completed, we expect the target firms with high levels of off-balance sheet leasing to generate negative post-acquisition performance. To summarise, we formally state and test the following hypothesis

Hypothesis 1*. Target firms' off-balance sheet leasing magnitude increases the likelihood of the M&A deal termination.*

Hypothesis 2. *Target firms' off-balance sheet leasing magnitude is negatively associated with the post-acquisition value creation of the M&A deal.*

3.4 Variables and model definitions

3.4.1 Measuring off-balance sheet leasing

From a lessee perspective, operating leases or off-balance sheet leasing consists of non-cancellable, long-term fixed cost commitments. These characteristics make off-balance sheet leasing similar to conventional debt.

The constructive capitalisation of operating leases is a well-established method in the accounting literature consisting of adjusting companies' accounts by bringing operating leases into the balance sheet as if it was accounted for as a capital lease (Imhoff et al. 1991, 1997; Graham et al., 1998). In this chapter, we follow Graham et al.'s (1998) methodology in order to estimate the amount of liabilities that would be brought into the balance sheet "as if" IFRS 16 *leases* are adopted. We define the following equation:

$$Oplease\_T\_Graham_{i,t} = Rental\ Expense_0 + \sum_{t=1}^{5} \frac{MLP_t}{(1+K_d)^t} \quad (1)$$

where $Rental\ Expense_0$ is the target firm's current rental expense, MLP_t is the minimum lease payments due in the next five years, and K_d is the discount rate set at 10% following Graham et al. (1998).

Rating agencies, such as S&P and Moody's, use an estimated method of operating leases similar to the approach adopted by Graham et al. (1998). In fact, S&P and Moody's

estimations account for long-term operating leases as they consider firms' off-balance sheet leasing commitments due beyond five years.

Thus, S&P's estimate of the debt equivalent of off-balance sheet leasing is based on the capitalisation of future minimum lease payments including commitments due beyond the fifth year. Based on the S&P methodology, we define the second proxy of target firms' off-balance sheet leasing as follows:

$$Oplease\_T\_S\&P_{i,t} = Rental\ Expense_0 + \sum_{t=1}^{5} \frac{MLP_t}{(1+K_d)^t} + \sum_{t=6}^{6+Addyrs} \frac{EMLP_t}{(1+K_d)^t} \quad (2)$$

The first two terms of Equation (2) are defined as in Equation (1). *Addyrs* refers to the remaining years in the life of the operating lease contract. *EMLPt* is the estimated annuity payable after the fifth year. As in Lim et al. (2017), we first estimate the remaining years in the operating lease contract (*Addyrs= Thereafter/MLP5*). Then, we estimate the annual *MLP* payable after the fifth year to the end of the lease life as: *Thereafter/Addyrs*. Finally, we calculate the present value of this annuity using a discount rate of 10 %.

Our third proxy of a target firm's off-balance sheet leasing follows Moody's methodology. Moody's calculation considers the higher value between the S&P estimation and the current operating lease rental expense multiplied by a factor of eight. As such, our third proxy of target firms' off-balance sheet leasing commitments is defined as follows:

$$Oplease\_T\_Moodys_{i,t} = \max\left(8 * Rental\ Expense_0\ ;\ Oplease\_T\_S\&P_{i,t}\right) \quad (3)$$

Appendix B.1 illustrates an example of the computation of operating lease commitments for a selected target firm from our sample data.

3.4.2 Measuring accounting quality

Previous studies find that the acquisition of target firms with low accounting quality are less likely to generate value for the shareholders of the merged entity and increase the likelihood that M&A deals are renegotiated or eventually terminated (Raman et al., 2013; Skaife and Wangerin, 2013; Marquardt and Zur, 2014; McNichols and Stubben, 2015; Martin and Shalev, 2017). To measure firms' accounting quality, the majority of prior studies investigating the relationship between post-acquisition performance and target

accounting quality use the magnitude of abnormal discretionary accruals to reflect management incentives to manipulate financial statements in order to meet a specific financial reporting objective during the target valuation process. The magnitude of discretionary accruals is a widely adopted approach to detect firms with a higher propensity of earnings manipulation that adversely affects the accounting quality of their financial statements. In accordance with the thesis scope, in contrast with real earnings management techniques, accruals-based earnings management are more likely to reflect firms' incentive to change reported accounting information and take advantage of loopholes within the accounting standard (Raman et al., 2013; Marquardt and Zur, 2014; McNichols and Stubben, 2015; Martin and Shalev, 2017). Dechow et al. (1995) find that the magnitude of discretionary accruals increases sharply for firms prone to accounting "window dressing", such as firms subject to enforcement actions by the SEC.

In accordance with prior studies (Raman et al., 2013; Marquardt and Zur, 2014; McNichols and Stubben, 2015; Martin and Shalev, 2017), we posit that target firms with large absolute values of discretionary accruals are more likely to manipulate their earnings reducing the accuracy of their reported financial information and, consequently, reducing the accounting quality of the target financial statement during the M&A's valuation process. To account for target firms' discretionary accruals, we follow Dechow et al. (1995) and Hutton, Marcus, and Tehranian (2009) and measure abnormal accruals from the modified Jones (1991) model. First, for each target company *i* observed at year *t*, where year *t* denotes one year before the acquisition year, we estimate the following model using an OLS regression for each year and industry:[21]

$$\frac{TAccr_{i,t}}{TA_{i,t-1}} = \alpha_0 \frac{1}{TA_{i,t-1}} + \beta_1 \frac{\Delta Sales_{i,t} - \Delta Receivables_{i,t}}{TA_{i,t-1}} + \beta_2 \frac{PPE_{i,t}}{TA_{i,t-1}} + \varepsilon_{i,t} \quad (4)$$

where $TAccr_{i,t}$ represents the total observed accruals for a target firm *i* at the end of year *t*. It accounts for the difference between the annual change of non-cash current assets and non-interest bearing current liabilities minus the annual amount of depreciation and

[21] We follow Dechow et al.'s (2011) industry classification based on SIC codes. SIC codes are retrieved from the Compustat database.

amortization. [22] [23] $TA_{i,t-1}$ denotes target *i*'s total assets at year *t*-1 where year *t* is the M&A deal announcement year. $\Delta Sales_{i,t}$ represents the annual variation of a target firm's total sales and revenue. $\Delta Receivables_{i,t}$ and $PPE_{i,t}$ denotes the change in firm *i*'s total receivables and the amount of property , plant, and equipment, respectively.

In addition, we define abnormal accruals as the difference between firm *i*'s observed total accruals and accruals predicted by Equation (4):

$$Abn\_Accruals_{i,t} = \frac{TAccr_{i,t}}{TA_{i,t-1}} - \left(\hat{\alpha}_0 \frac{1}{TA_{i,t-1}} + \hat{\beta}_1 \frac{\Delta Sales_{i,t} - \Delta Receivables_{i,t}}{TA_{i,t-1}} + \hat{\beta}_2 \frac{PPE_{i,t}}{TA_{i,t-1}} + \varepsilon_{i,t}\right) \quad (5)$$

Moreover, we define the variable $AbsV\_Abn\_Accruals_{i,t}$ as the absolute value of each target's abnormal accruals ($Abn\_Accruals_{i,t}$). It is common practice in the accounting literature to use abnormal accruals, as defined in Equation (5), to account for the likelihood of earnings management within a corporation (Dechow et al., 2011, Marquardt and Zur, 2014; McNichols and Stubben, 2015; Martin and Shalev, 2017; Chen et al., 2018). The majority of these previous studies rely on the value discretionary accruals lagged by one year to proxy for earnings management or financial statements manipulation. In the current study, we follow Hutton et al. (2009) and define instead a three-year moving sum of the absolute value of discretionary accruals. The intuition behind Hutton et al.'s (2009) definition is that firms that consistently manipulate their financial statements will exhibit a consistently higher value of abnormal accruals over three years prior to the observed year signalling a better an underlying incentive to manage earnings. In contrast, a single year observation of discretionary accruals could reflect an isolated peak.

Thus, we define the variable *Opaque_T* as the target firm's three-year moving sum of the absolute value of abnormal annual discretionary accruals:

$$Opaque_T = AbsV\_Abn\_Accruals_{i,t-1} + AbsV\_Abn\_Accruals_{i,t-2} + AbsV\_Abn\_Accruals_{i,t-3} \quad (6)$$

[22] Non-cash current assets are computed as the difference between the annual change in current assets minus the annual change in cash.

[23] Non-interest bearing current liabilities are calculated as the difference between the annual change in current liabilities minus the annual change in short-term debt included in current liabilities.

For a target firm *i* observed at year *t* where year *t* denotes the M&A deal announcement year, a significant value of the variable *Opaque_T* denotes a significant opacity or low accounting quality of target *i*'s financial statement. In other terms, *Opaque_T* signals the presence of large absolute values of abnormal accruals of the target firm over the three years prior to the M&A deal announcement year. Appendix B.2 details the construction of the variable *Opaque_T*.

3.4.3 Measuring post-acquisition performance

The value gained from an M&A deal can be measured by the variation of a firm's long-term operating performance as proxied by the return on assets (*ROA*). Studies adopting this measure posit that the gain (or loss) from acquisition will be translated through the merged company long-term post-acquisition operating performance (Wang and Xie, 2009; Martin and Shalev, 2017).

We account for post-acquisition value creation of M&A's by inspecting the changes in the merged entity's operating performance before and after the M&A announcement (Wang and Xie, 2009; Martin and Shalev, 2017). We define acquirer post-acquisition performance (ΔROA) as the difference between the acquirer return on assets one year after the acquisition and the acquirer and target combined return on assets one year before the acquisition.

$$\Delta ROA = ROA_{acquirer(t+1)} - ROA_{target+acquirer(t-1)} \quad (7)$$

In Equation (7), $ROA_{acquirer(t+1)}$ is the ratio between the acquirer operating income before depreciation and its total assets observed one year after the acquisition announcement. $ROA_{target+acquirer(t-1)}$ is the ratio between the sum of acquirer and target operating performance divided by acquirer and target average total assets observed one year before the acquisition announcement.

Prior studies on the relationship between target accounting quality and M&A's value creation also considered the market reaction to M&A's announcements as a proxy for the merged entity performance (Martin and Shalev, 2017; McNichols and Stubben, 2015). In the current chapter, we examine only the long-term post-acquisition performance based on accounting measures (i.e., return on assets). We posit that as off-balance sheet leasing

is defined as a non-cancellable, long-term fixed claim, the effect of target off-balance sheet commitments on the merged entity value will be materialised only in the long run.

3.4.4 Model definition

Marquardt and Zur (2014) argue that the likelihood of M&A deal completion is lower when target firms' accounting quality is poor. Similarly, Skaife and Wangerin (2013) report that M&A deals where target firms exhibit low accounting quality and high off-balance sheet commitments are more likely to be terminated before the deal completion date. We extend Skaife and Wangerin (2013) by analysing an important and yet less investigated form of off-balance sheet liability, which is operating leases. While Skaife and Wangerin's (2013) measure of off-balance sheet liabilities is a proxy measure, we use an actual accounting measure of off-balance sheet commitments based on firms' operating lease activity.[24] We extend Skaife and Wangerin (2013) by analysing to what extent the emergence of negative information about the target, such as a significant amount of off-balance sheet leasing, could adversely affect the target's valuation leading, eventually, to deal termination.

We predict that two attributes of a target's firm information environment, namely, the magnitude of off-balance sheet liabilities, as well as the quality of its financial statements, increase the probability that an announced M&A deal is subsequently terminated. We test these predictions using the following logistic regression model:

$$Termination = \beta_0 + \beta_1 Oplease_T + \beta_2 Opacity_T + \beta_4 Deal_{controls} + \beta_5 Target_{controls} + \beta_6 Acquirer_{controls} + \varepsilon_i \quad (8)$$

where the dependent variable, *Termination*, is a dummy variable that takes a value of one if the M&A deal is terminated after the announcement date and is zero otherwise.

In line with previous research, we control for deal characteristics variables, as well as a set of target and acquirer firms' variables, that significantly affect the probability of an M&A's deal termination (Skaife and Wangerin, 2013; Marquardt and Zur , 2014).We also posit

[24] Following Barth (1991), Skaife and Wangerin (2013) define off-balance sheet liabilities as the residual from the cross-sectional industry-year regression of stock prices on assets and liabilities.

that when a targets' accounting information is higher, the bidder's ability to value the target's future expected cash flows is higher resulting in a gain from the acquisition (Raman et al., 2013; Marquardt and Zur, 2014; McNichols and Stubben, 2015; Martin and Shalev, 2017; Chen et al., 2018). We contribute to the literature analysing the relationship between post-acquisition performance and target accounting quality by investigating two attributes of target firms' accounting information environment: the magnitude of target firms' off-balance sheet leasing (*OBSL_T*) and the quality of its financial statement information (*Opacity_T*). We define the following cross-sectional regression model:

$$\Delta \mathrm{ROA} = \beta_0 + \beta_1 Oplease_T + \beta_2 Opacity_T + \beta_4 Deal_{controls} + \beta_5 Target_{controls} + \\ + \beta_6 Acquirer_{controls} + \varepsilon_i \quad (9)$$

In Equation (8), the dependent variable is ΔROA_{it} and accounts for the acquirer post-acquisition performance for announced and completed M&A deals. Our variable of interest is the target firms' magnitude of off-balance sheet leasing (*OBSL_T*).

In Equations (7) and (8), our control variables selection procedure follows previous studies on M&A deal processes, as well as post-acquisition performance (Lang, Stulz, and Walkling, 1991; Moeller, Schlingemann, and Stulz, 2004; Raman et al., 2013; Skaife and Wangerin, 2013; Marquardt and Zur , 2014; McNichols and Stubben, 2015; Martin and Shalev, 2017; Chen at al., 2018). We account for three variable categories that have a potential explanatory power on post-acquisition value creation: deal-specific variables ($DEAL_{controls}$), target characteristics ($TRG_{controls}$), and acquirer characteristics ($ACQ_{controls}$)

In line with previous studies, we control for deal characteristics (Moeller et al., 2004; Harford, Humphery-Jenner, and Powell, 2012; Martin and Shalev, 2017; Chen et al., 2018). $Deal_{controls}$ includes method of payment (i.e., dummy variables *All_cash* and *All_shares* or mixed payments), as well as other M&A deal characteristics, such as whether the acquisition is hostile, the tender offer, and a dummy variable that indicates whether the acquirer and target belong to the same industry. Belonging to the same industry decreases the adverse effect of asymmetry of information between the acquirer and the target (Chen et al., 2018). We expect acquisitions in the same industry to generate better post-acquisition performance. Moreover, we define the variable

Multibid, which takes a value of one (and zero otherwise) if several potential acquirers are competing for the same target.

We include in Equations (7) and (8) a set of variables that account for target characteristics. We control for target's size (*Size_T*), leverage (*Lev_T*), Tobin's Q (*Tobin_T*), and return on assets (*ROA_T*).

Acquirer controls consist of acquirer size (*Size_A*), leverage (*Lev_A*), Tobin's Q (*Tobin_A*), and acquirer free cash flow (*FCF_A*). Our model controls for acquirer's size to account for prior studies' findings suggesting that larger firms are less likely to generate value for their shareholders after the acquisition as larger corporation are associated with a greater probability of managerial hubris (Moeller et al., 2004; Harford et al., 2012). Moreover, in accordance with Maloney, McCormick, and Mitchell (1993), we control for the level of debt of the acquiring firm and we hypothesise that acquirers with higher leverage are more likely to make a value enhancing acquisition decision due to better monitoring by debt holders. We also control for the effect of the acquirer investment opportunity set on post-acquisition value creation by introducing the variable *TobinQ_A*. However, previous empirical results provide mixed results regarding the direction of this effect. Moeller et al. (2004) and Dong et al. (2006) find that the acquirers' level of opportunity set is negatively associated with post-acquisition value creation, while Harford et al. (2012) report a positive association between the acquirer's Tobin's Q and post-acquisition performance. Moreover, in accordance with Lang et al. (1991), we account for the acquirer's free cash flow (FCF_A). Lang et al. (1991) argue that M&As are less likely to generate value for acquirers with a high level of free cash flow. Appendix B.3 presents the definitions and construction procedure of the study variables.

3.5 Sample selection and descriptive statistics

3.5.1 Sample selection

We retrieve data relative to the firms' M&A activity from the SDC database. We observe all U.S. firms' acquisitions announced from 1983-2018. Table 3.1 summarises our sample selection procedure. We start with all announced deals where the SDC identifies the deal type as a merger or acquisition. Then, we select deals where the country code of the acquirer and the target denotes the United States (U.S.). This process leads to an initial

sample of 10,552 mergers and acquisitions. Next, due to disparities in accounting and reporting rules, we exclude M&As where the acquirer or the target is a financial institution or utility (Moeller et al., 2004; McNichols and Stubben, 2015; Chen et al., 2018). Data relative to operating lease commitments, as well as accounting and financial information, is collected from the Compustat database. We exclude from the sample M&A deals where data relative to the acquirer or the target is not available in the Compustat database. We also exclude observations with missing values on the acquirer or target total assets. Our final sample contains 1,711 domestic U.S. M&A deals announced from 1983-2018. Among these announced M&A deals, a total of 255 are ultimately terminated after the deal announcement date.

Table 3-1 Sample selection for M&A announced deals

	Number of deals
Initial Sample: All U.S. domestic mergers and acquisitions of publicly listed companies announced from 1983-2018 and available from the SDC database.	**10,552**
We exclude mergers and acquisitions where the acquirer or the target is a financial institution or utility.	(3,956)
We exclude deals without data on Compustat for the target company.	(2,532)
We exclude deals without data in Compustat for the acquiring company.	(1,946)
We exclude deals with missing values on the acquirer or target total assets.	(407)
Final sample (domestic merger deals announced from 1983-2018.)	**1,711**

Notes:

1. Source of data: SDC and Compustat.
2. The final sample of 1,711 M&A deals contains two subsamples:

- 1,456 completed M&A deals
- 255 uncompleted M&A deals where the acquirer withdraw from the M&A process.

3.5.2 Descriptive statistics

Table 3.2 reports the descriptive statistics for our overall sample of 1,711 U.S. M&A deals announced from 1983-2018. We also distinguish between the summary statistics of terminated and completed M&A deals.

Table 3.2 indicates that for the overall sample, on average, target firms' off-balance sheet commitments is at around 11% of their total assets. This value is consistent across the three measures of target off-balance sheet leasing (*OBSL_T_Graham*, *OBSL_T_S&P*, and *OBSL_T_Moodys*). In addition, and more significant for our analysis, Table 3.2 indicates that in the case of terminated M&A deals, on average, targets operating lease commitments as a percentage of total assets (OBSL_T_Graham) is higher for terminated M&A deals (13%) compared to completed M&A deals (10%). The difference between terminated vs. completed deals remains large if we take into account target firms' operating lease commitments due in the long-term as measured by the variables OBSL_T_S&P and OBSL_T_Moodys. Following S&P measure, targets' operating lease commitments as a percentage of its total assets (OBSL_T_S&P) is 3% for terminated M&A deals compared to completed deals.

Recall that following Hutton et al. (2009), the variable *Opaque_T* measures the level of transparency of a target firm's financial statements one year prior to the M&A announcement year. Table 3.2 reports that, on average, target firms' of terminated M&A deals have a slightly higher value of financial statement opacity (Opaque_T) compared to target firms' of terminated M&A deals. This figure corresponds to a difference of 2.1% in a target's firm annual absolute value of discretionary accruals as a percentage of its total assets. Thus, target firms' in terminated deals are more likely to be subject to window dressing revealing more opaque and less transparent accounting information.

Table 3.2 also reports the summary statistics for the M&A deal characteristics, as well as target and acquirer controls. In accordance with Chen et al. (2018), Table 3.2 indicates that, on average, acquirers' *TobinQ* is higher than the targets. In terms of M&A deal methods of payment, the overall sample summary statistics indicate that 34.8% of the announced deals are paid using cash and 25.3% are financed by shares. Contrary to Skaife and Wangerin (2013), Table 3.2 reports no significant difference, on average, between the method of payment used in terminated and completed M&A deals.

Table 3.3 provides the correlation matrix coefficients of the study's independent variables. To estimate the coefficients of the regression model in Equation (8) we follow a logistic regression. Moreover, to estimate the coefficients of the regression models in Equations (9), we follow the ordinary least square regression (OLS). One of the assumptions of the OLS regression is the absence of multicollinearity between the independent variables (Wooldridge, 2010). Accordingly, we address the issue of multicollinearity by considering several specifications by dropping highly correlated variables.

Table 3-2 Descriptive statistics

	All announced M&A deals (N=1711)			Terminated M&A deals (N=255)			Completed M&A deals (N=1456)		
	Mean	Median	St.Dev	Mean	Median	St.Dev	Mean	Median	St.Dev
Panel A: Target off-balance sheet leasing and accounting quality									
OBSL_T_Graham	0.108	0.059	0.139	0.131	0.063	0.169	0.104	0.058	0.133
OBSL_T_S&P	0.119	0.063	0.162	0.144	0.064	0.200	0.115	0.062	0.154
OBSL_T_Moodys	0.110	0.054	0.156	0.135	0.057	0.193	0.106	0.053	0.149
Opaque_T	0.093	0.074	0.113	0.111	0.073	0.200	0.090	0.074	0.090
Panel B: M&A deal controls									
Ind_Related	0.655	1.000	0.475	0.620	1.000	0.486	0.661	1.000	0.473
Hostile	0.072	0.000	0.258	0.365	0.000	0.482	0.021	0.000	0.142
Multibid	0.070	0.000	0.255	0.235	0.000	0.425	0.041	0.000	0.199
Tender Offer	0.212	0.000	0.409	0.149	0.000	0.357	0.223	0.000	0.417
Cash	0.348	0.000	0.477	0.302	0.000	0.460	0.356	0.000	0.479
Shares	0.253	0.000	0.435	0.255	0.000	0.437	0.253	0.000	0.435
Mixed	0.146	0.000	0.353	0.137	0.000	0.345	0.147	0.000	0.354
Panel C: Target controls									
Size_T	5.190	5.064	1.937	5.134	4.923	2.016	5.199	5.083	1.924
TobinQ_T	1.377	0.921	1.506	1.214	0.780	1.418	1.405	0.958	1.520
ROA_T	0.034	0.103	0.257	0.070	0.112	0.200	0.028	0.101	0.265
Leverage_T	0.233	0.186	0.238	0.252	0.217	0.230	0.230	0.175	0.239
Panel D: Acquirer controls									
Size_A	6.963	6.973	2.300	5.891	5.692	2.179	7.151	7.150	2.270
Leverage_A	0.230	0.204	0.193	0.248	0.220	0.210	0.227	0.202	0.190
TobinQ_A	1.707	1.236	1.775	1.546	0.922	2.003	1.735	1.278	1.732
FCF_A	0.059	0.087	0.159	0.030	0.067	0.187	0.065	0.089	0.154

Notes. This table illustrates descriptive statistics for our sample of 1,711 U.S. M&A deals announced from 1983-2018. Furthermore, we distinguish between M&A deals that are terminated after the announcement date (255 U.S. M&A deals) and M&A deals that are subsequently completed (1,456 M&A deals). Please refer to Appendix B for variable definitions.

Table 3-3 Correlation Matrix

Table 3. Correlation Matrix.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) OBSL_T_Graham	1.000																		
(2) OBSL_T_S&P	0.979	1.000																	
(3) OBSL_T_Moodys	0.946	0.975	1.000																
(4) Opaque_T	0.062	0.043	0.025	1.000															
(5) Ind_Related	0.021	0.033	0.038	-0.035	1.000														
(6) Hostile	0.001	0.008	0.010	-0.040	-0.012	1.000													
(7) Multibid	0.052	0.056	0.064	-0.047	0.036	0.251	1.000												
(8) Tender Offer	0.002	0.006	0.011	-0.051	-0.024	0.082	0.160	1.000											
(9) Cash	-0.003	-0.002	-0.000	-0.040	-0.040	0.077	0.063	0.398	1.000										
(10) Shares	0.042	0.024	0.004	0.062	0.018	-0.079	-0.081	-0.269	-0.426	1.000									
(11) Mixed	-0.045	-0.029	-0.020	-0.027	0.048	0.026	0.055	-0.084	-0.302	-0.240	1.000								
(12) Size_T	-0.242	-0.191	-0.133	-0.163	0.076	0.100	0.072	-0.011	-0.077	-0.190	0.189	1.000							
(13) TobinQ_T	-0.088	-0.085	-0.098	0.079	0.027	-0.055	-0.076	-0.039	-0.032	0.176	-0.030	-0.079	1.000						
(14) ROA_T	-0.170	-0.145	-0.091	-0.159	-0.019	0.074	0.067	0.019	0.028	-0.129	0.058	0.366	-0.102	1.000					
(15) Leverage_T	-0.015	-0.003	0.016	-0.033	0.052	0.015	0.022	-0.080	-0.189	-0.093	0.032	0.203	-0.297	0.027	1.000				
(16) Size_A	-0.195	-0.155	-0.127	-0.157	-0.036	-0.028	-0.031	0.106	0.199	-0.270	0.039	0.646	0.097	0.182	0.047	1.000			
(17) Leverage_A	-0.028	-0.015	0.001	-0.027	-0.005	0.047	0.016	-0.073	-0.083	-0.084	0.015	0.148	-0.118	0.095	0.306	0.135	1.000		
(18) TobinQ_A	-0.005	-0.013	-0.024	0.017	0.029	-0.059	-0.044	-0.022	-0.034	0.179	-0.035	-0.107	0.370	-0.134	-0.209	-0.101	-0.327	1.000	
(19) FCF_A	-0.077	-0.062	-0.045	-0.125	0.001	0.038	0.054	0.127	0.156	-0.166	0.035	0.172	0.017	0.339	-0.036	0.328	-0.021	-0.033	1.000

Notes. This table reports the correlation matrix of the study variables. The sample includes 1,711 U.S. M&A deals announced from 1983-2018. Variables *OBSL_T_Graham*, *OBSL_T_S&P* , and *OBSL_T_Moodys* are the variables of interest and represent the target magnitude of off-balance sheet leasing one year before the M&A deal announcement. The variable *Opaque_T* is a measure of target accounting transparency as in Hutton et al. (2009). In addition, we control for whether the acquirer and the target belong to the same Industry deal characteristics', as well as whether the deal is a hostile deal, a multi-bid, or tender offer. We control for the M&A deal method of payment (cash, shares, or a mix of both). We also account for target and acquirer firm characteristics' (i.e., leverage, Tobin's Q, ROA, and FCF). Please refer to Appendix B for variable definitions.

3.6 Empirical results

3.6.1 The effect of target pre-acquisition operating leases on the likelihood of the M&A deal termination

In this section, we test our first hypothesis and investigate to what extent the targets' off-balance sheet leasing magnitude, observed one year prior to the acquisition deal announcement, affects the likelihood that an announced M&A deal will ultimately be terminated. Table 3.4 reports the empirical results of the Logistic regression of Equation (8). In Table 3.4, the dependent variable (*Terminated*) is a dummy variable that takes a value of one if the announced M&A deal is ultimately terminated and zero otherwise.

In Model (1) of Table 3.4, the variable of interest is the value of target firm *i*'s off-balance sheet leasing expressed as a percentage of its total assets and observed one year prior to the acquisition year (*OBSL_T_Graham*). We follow Graham et al.'s (1998) capitalisation method for the calculation of this variable. As a robustness check, we also consider two additional measures of the targets' off-balance sheet leasing magnitude. Accordingly, in Model (2) of Table 3.4, the variable of interest is *OBSL_T_S&P* and follows the S&P calculation procedure. In Model (3) of the same table, the variable of interest is *OBSL_T_Moodys* and follows Moody's calculation method.[25]

Table 3.4 indicates that the variable *OBSL_T_Graham* is significant in explaining the likelihood of M&A deal termination. In accordance with our expectations, the magnitude of off-balance sheet leasing of target firm one year prior to the M&A deal announcement increases the likelihood of merger deal termination by around 12%. The relationship between the target's operating lease magnitude and the probability of an M&A deal termination remains significant when considering two additional proxies of firms' operating leases: *OBSL_T_S&P* and *OBSL_T_Moodys*.

In line with our predictions, Table 3.4 reports that the variable *Opaque_T* is significantly and positively related to the likelihood that an announced deal will go bust. This result is in line with Skaife and Wangerin (2013) who find that M&A deals involving targets with

[25] Please refer to Appendix B.1 for a detailed presentation of how the dependent variables OBSL_T_Graham, OBSL_T_S&P, and OBSL_T_Moodys are calculated.

low accounting quality and opaque financial statements are more likely to be terminated before the completion date.

Table 3-4 The effect of target pre-acquisition off-balance sheet leasing on the likelihood of M&A deal termination

	Model 1					Model 2					Model 3				
OBSL_T_Graham	0.111**	0.122**	0.114**	0.114**	0.106**										
	(0.054)	(0.053)	(0.054)	(0.054)	(0.054)										
OBSL_T_S&P						0.085*	0.091**	0.100**	0.098**	0.087*					
						(0.046)	(0.046)	(0.046)	(0.046)	(0.046)					
OBSL_T_Moodys											0.094**	0.106**	0.112**	0.094**	0.096**
											(0.047)	(0.047)	(0.047)	(0.047)	(0.047)
Opaque_T	0.200***	0.229***	0.202***	0.203***		0.201***	0.232***	0.258***		0.205***	0.202***	0.234***	0.260***		0.205***
	(0.065)	(0.065)	(0.065)	(0.065)		(0.065)	(0.065)	(0.065)		(0.065)	(0.065)	(0.065)	(0.065)		(0.065)
Ind_Related	-0.032**	-0.024	-0.034**	-0.034**	-0.033**	-0.032**	-0.024	-0.024	-0.026*	-0.034**	-0.032**	-0.024	-0.025	-0.034**	-0.034**
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.016)	(0.016)	(0.015)	(0.015)	(0.015)	(0.016)	(0.015)	(0.015)
Hostile	0.587***	0.614***	0.587***	0.587***	0.587***	0.587***	0.613***	0.612***	0.611***	0.587***	0.588***	0.613***	0.612***	0.586***	0.588***
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)
Multibid	0.240***	0.259***	0.236***	0.236***	0.237***	0.240***	0.260***	0.257***	0.257***	0.237***	0.240***	0.259***	0.256***	0.238***	0.237***
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)
Tender Offer	-0.090***	-0.095***	-0.089***	-0.086***	-0.092***	-0.090***	-0.095***	-0.098***	-0.096***	-0.087***	-0.090***	-0.095***	-0.098***	-0.092***	-0.087***
	(0.020)	(0.020)	(0.019)	(0.019)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)
All_cash	-0.022	-0.048**		0.009	-0.025	-0.023	-0.048**	-0.054**	-0.049**	0.008	-0.023	-0.048**	-0.053**	-0.023	0.008
	(0.021)	(0.021)		(0.018)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.018)	(0.021)	(0.021)	(0.021)	(0.021)	(0.018)
All_shares	-0.045**	-0.029	-0.022		-0.043**	-0.045**	-0.029	-0.023	-0.028		-0.045**	-0.028	-0.022	-0.046**	
	(0.022)	(0.022)	(0.018)		(0.021)	(0.022)	(0.022)	(0.022)	(0.022)		(0.022)	(0.022)	(0.022)	(0.022)	
Mixed	-0.064***	-0.062**			-0.064***	-0.064***	-0.063**	-0.065***	-0.064***		-0.064***	-0.063**	-0.065***	-0.065***	
	(0.024)	(0.024)			(0.024)	(0.024)	(0.024)	(0.024)	(0.024)		(0.024)	(0.024)	(0.024)	(0.024)	
Size_T	0.013**		0.012**	0.012**	0.011**	0.013**				0.012**	0.013**			0.012**	0.011**
	(0.006)		(0.006)	(0.006)	(0.006)	(0.006)				(0.006)	(0.006)			(0.006)	(0.006)
TobinQ_T	0.008	-0.002	0.008	0.007		0.008	-0.002	-0.003	-0.000	0.007	0.008	-0.002	-0.003	0.010*	0.007
	(0.006)	(0.005)	(0.006)	(0.006)		(0.006)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.005)	(0.005)	(0.006)	(0.006)
ROA_T	0.081**		0.084**	0.085***	0.070**	0.080**				0.084**	0.078**			0.069**	0.082**
	(0.033)		(0.033)	(0.033)	(0.033)	(0.033)				(0.033)	(0.033)			(0.033)	(0.033)
Leverage_T	0.007	-0.002	0.018	0.022	-0.006	0.007	-0.003	-0.002	-0.004	0.022	0.007	-0.004	-0.002	0.006	0.021
	(0.035)	(0.035)	(0.034)	(0.034)	(0.033)	(0.035)	(0.035)	(0.035)	(0.035)	(0.034)	(0.035)	(0.035)	(0.035)	(0.035)	(0.034)
Size_A	-0.032***		-0.031***	-0.031***	-0.031***	-0.032***				-0.031***	-0.032***			-0.033***	-0.031***
	(0.005)		(0.005)	(0.005)	(0.005)	(0.005)				(0.005)	(0.005)			(0.005)	(0.005)
Leverage_A	0.026	0.001	0.031	0.032	0.032	0.026	-0.000	0.003	-0.004	0.032	0.026	-0.001	0.002	0.025	0.032

	(0.041)	(0.042)	(0.041)	(0.041)	(0.040)	(0.041)	(0.042)	(0.042)	(0.042)	(0.041)	(0.041)	(0.042)	(0.042)	(0.041)	(0.041)
TobinQ_A	-0.003	-0.001	-0.003	-0.003		-0.003	-0.001	-0.000	-0.001	-0.003	-0.003	-0.001	-0.000	-0.004	-0.003
	(0.005)	(0.005)	(0.005)	(0.005)		(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
FCF_A	-0.103**	-0.160***	-0.109**	-0.107**	-0.111**	-0.103**	-0.162***		-0.181***	-0.107**	-0.103**	-0.163***		-0.110**	-0.107**
	(0.051)	(0.047)	(0.052)	(0.051)	(0.052)	(0.051)	(0.047)		(0.047)	(0.051)	(0.051)	(0.047)		(0.052)	(0.051)
_cons	0.270***	0.135***	0.247***	0.233***	0.304***	0.275***	0.138***	0.126***	0.162***	0.238***	0.276***	0.137***	0.125***	0.307***	0.239***
	(0.037)	(0.027)	(0.035)	(0.034)	(0.034)	(0.037)	(0.027)	(0.027)	(0.026)	(0.033)	(0.036)	(0.027)	(0.027)	(0.035)	(0.033)
Obs.	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711
Pseudo R-squared	0.312	0.287	0.309	0.308	0.306	0.311	0.286	0.281	0.281	0.308	0.311	0.287	0.282	0.308	0.308

Notes. This table reports the findings of our first regression that investigates the relationship between target off-balance sheet leasing magnitude one year prior to the M&A deal announcement and the likelihood that the announced M&A deal is subsequently terminated. The sample contains 1,711 U.S. M&A deals announced from 1983-2018. The model dependent variable is a dummy variable that takes a value of one if the announced M&A deal is subsequently terminated and zero otherwise. We adopt a logistic regression. Target magnitude of off-balance sheet leasing is measured with three proxies. Model (1) reports the regression results where the target magnitude of off-balance sheet leasing is defined following Graham et al.'s (1998) capitalisation of future minimum lease payments *(OBSL_T_Graham*). In Model (2), the target magnitude of off-balance sheet leasing is defined following the S&P method (*OBSL_T_S&P*). In Model (3), the target off-balance sheet leasing intensity is defined following Moody's methodology (*OBSL_T_Moodys*). Following Hutton et al. (2009), we define the variable *Opaque_T* as the target firm's three-year moving sum of the absolute value of abnormal annual discretionary accruals. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level of risk, respectively. All variable definitions are provided in Appendix B.3.

3.6.2 The effect of target pre-acquisition operating leases on M&A deals' post-acquisition performance

Table 3.5 reports the regression results of our second investigation that tests the effect of the targets' off-balance sheet leasing on post-acquisition performance for announced and completed M&A deals. The sample size is reduced to 1,356 M&A deals as we observe only announced and completed deals and we require enough observations to calculate the variation of the merged entity performance one year before and after the announcement year. Accordingly, in Table 3.5, the dependent variable is the merged entity post-acquisition performance, ΔROA, defined in Equation (7).

Central to our analysis, Table 3.5 indicates that the targets' off-balance sheet leasing magnitude has a significant positive impact on the merged entity's post-acquisition performance. In Model (1) of Table 3.5, the coefficient on the variable *OBSL_T_Graham*, which measures the targets' off-balance sheet magnitude following Graham et al. (1998), is positive (0.048) and statistically significant at 1% level of risk. Furthermore, with lower statistical significance, Table 3.5 reports that the target firms' off-balance sheet leasing prior to the M&A announcement year has a positive impact on post-acquisition performance if we account for long-term operating leases as measured by the variables *OBSL_T_S&P* and *OBSL_T_Moodys*.

Table 3-5 The effect of target pre-acquisition off-balance sheet leasing on M&A deal post-acquisition performance

	Model 1					Model 2					Model 3				
OBSL_T_Graham	0.024	0.048***	0.024	0.025	0.040**										
	(0.019)	(0.018)	(0.019)	(0.019)	(0.019)										
OBSL_T_S&P						0.018	0.036**	0.018	0.018	0.031*					
						(0.016)	(0.016)	(0.016)	(0.016)	(0.016)					
OBSL_T_Moodys											0.019	0.030*	0.019	0.019	0.022
											(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Opaque_T	-0.045*	-0.008	-0.046*	-0.046*	-0.018	-0.045	-0.006	-0.045*	-0.045*	-0.017	-0.044	-0.003	-0.045*	-0.045*	-0.045*
	(0.027)	(0.027)	(0.027)	(0.027)	(0.028)	(0.027)	(0.027)	(0.027)	(0.027)	(0.028)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)
Ind_Related	0.004	0.005	0.004	0.004	0.006	0.004	0.005	0.004	0.004	0.006	0.004	0.005	0.004	0.004	0.003
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Hostile	-0.019	-0.024	-0.019	-0.020	-0.019	-0.020	-0.025	-0.020	-0.020	-0.020	-0.019	-0.025	-0.019	-0.020	-0.018
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Multibid	-0.010	-0.012	-0.011	-0.011	-0.009	-0.010	-0.012	-0.010	-0.011	-0.009	-0.010	-0.012	-0.010	-0.011	-0.009
	(0.012)	(0.013)	(0.012)	(0.012)	(0.013)	(0.012)	(0.013)	(0.012)	(0.012)	(0.013)	(0.012)	(0.013)	(0.012)	(0.012)	(0.012)
Tender Offer	0.002	0.003	0.003	0.001	0.003	0.002	0.003	0.003	0.001	0.003	0.002	0.003	0.003	0.001	0.002
	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)	(0.006)	(0.007)	(0.006)	(0.006)	(0.006)
All_cash	0.003	0.007		0.003	0.004	0.003	0.007		0.003	0.004	0.003	0.007		0.003	0.004
	(0.007)	(0.007)		(0.006)	(0.006)	(0.007)	(0.007)		(0.006)	(0.006)	(0.007)	(0.007)		(0.006)	(0.007)
All_shares	0.003	0.006	0.003		0.003	0.003	0.006	0.003		0.003	0.003	0.006	0.003		-0.001
	(0.007)	(0.007)	(0.006)		(0.007)	(0.007)	(0.007)	(0.006)		(0.007)	(0.007)	(0.007)	(0.006)		(0.007)
Mixed	-0.005	-0.005				-0.005	-0.005				-0.005	-0.005			-0.005
	(0.008)	(0.008)				(0.008)	(0.008)				(0.008)	(0.008)			(0.008)
Size_T	-0.000		-0.001	-0.000	-0.005***	-0.000		-0.001	-0.001	-0.005***	-0.000		-0.001	-0.001	-0.000
	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)
TobinQ_T	-0.003	-0.002	-0.003*	-0.003		-0.003*	-0.002	-0.003*	-0.003		-0.003	-0.002	-0.003*	-0.003	
	(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)	
ROA_T	-0.087***		-0.087***	-0.087***		-0.088***		-0.087***	-0.087***		-0.088***		-0.088***	-0.088***	-0.085***
	(0.011)		(0.011)	(0.011)		(0.011)		(0.011)	(0.011)		(0.011)		(0.011)	(0.011)	(0.011)
Leverage_T	-0.006	0.000	-0.007	-0.006	0.010	-0.006	-0.000	-0.007	-0.006	0.010	-0.006	-0.001	-0.007	-0.006	0.001
	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)
Size_A	0.000		0.001	0.000	0.002	0.000		0.001	0.000	0.002	0.000		0.001	0.000	-0.000
	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)

Leverage_A	0.006	-0.001	0.006	0.006	0.004	0.006	-0.001	0.005	0.006	0.004	0.006	-0.002	0.005	0.006	0.014
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
TobinQ_A	-0.003*	-0.002	-0.003*	-0.003*		-0.003*	-0.002	-0.003*	-0.003*		-0.003*	-0.002	-0.003*	-0.003*	
	(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)	
FCF_A	-0.224***	-0.275***	-0.224***	-0.225***	-0.276***	-0.224***	-0.276***	-0.224***	-0.225***	-0.276***	-0.224***	-0.277***	-0.224***	-0.225***	-0.227***
	(0.019)	(0.017)	(0.019)	(0.019)	(0.018)	(0.019)	(0.017)	(0.019)	(0.019)	(0.018)	(0.019)	(0.017)	(0.019)	(0.019)	(0.019)
_cons	0.018	0.008	0.019	0.020*	0.011	0.020	0.009	0.020	0.021*	0.013	0.020	0.010	0.020*	0.021*	0.010
	(0.013)	(0.009)	(0.012)	(0.012)	(0.012)	(0.013)	(0.009)	(0.012)	(0.012)	(0.012)	(0.013)	(0.009)	(0.012)	(0.011)	(0.012)
Obs.	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356
R-squared	0.223	0.180	0.222	0.222	0.183	0.223	0.179	0.222	0.222	0.182	0.223	0.178	0.222	0.222	0.217

Notes. This tables reports the findings of our second regression that investigates the relationship between the target off-balance sheet leasing magnitude one year prior to the M&A deal announcement and the likelihood that the announced and completed M&A deal generates post-acquisition value for the merged entity. The sample contains 1,356 U.S. M&A deals announced and completed from 1983-2018. The model dependent variable is the acquirer post-acquisition performance (ΔROA). The target magnitude of off-balance sheet leasing is measured with three proxies. Model 1 reports the regression results where the target magnitude of off-balance sheet leasing is defined following Graham et al.'s (1998) capitalisation of future minimum lease payments (*OBSL_T_Graham*). In Model 2, the target magnitude of off-balance sheet leasing is defined following the S&P method (*OBSL_T_S&P*). In Model 3, the target off-balance sheet leasing intensity is defined following Moody's methodology (*OBSL_T_Moodys*). Following Hutton et al. (2009), we define the variable *Opaque_T* as the target firm's three-year moving sum of the absolute value of abnormal annual discretionary accruals. Robust sstandard errors are reported in parentheses. ***, **, and * denote statistical significance at 1%, 5%, and 10% level of risk, respectively. All variable definitions are provided in Appendix B

3.7 Discussion and additional analyses:

3.7.1 Discussion

Our investigation validates *Hypothesis 1* by demonstrating that target firms' off-balance sheet leasing magnitude observed one year prior to the M&A's announcement year significantly increases the probability that the announced M&A deal is ultimately terminated. Skaife and Wangerin (2013) find that the likelihood that an M&A deal is terminated increases if the accounting quality of the target firm is poor. Their measure of accounting quality takes into consideration target firms' magnitude of off-balance sheet liabilities. Skaife and Wangerin's (2013) study implies that the magnitude of the target firm's off-balance sheet commitments increases the likelihood of M&A deal termination. Our results extend Skaife and Wangerin (2013) by suggesting that a specific and dominant form of off-balance sheet liabilities, off-balance sheet leasing, significantly increases the likelihood that after transactional due diligence is conducted, the acquiring firm withdrew from the M&A deal process.[26]

Dechow et al. (2011) find that the use and magnitude of off-balance sheet leasing increases significantly in firms subject to accounting misstatement. Dechow et al. (2011) argue that the incentive to opt for off-balance sheet leasing is higher if the company is seeking to manipulate its financial statement. In the context of corporate acquisitions, our findings extend Dechow et al. (2011) by demonstrating that the magnitude of firms' off-balance sheet leasing reduces the trustworthiness of the reliability of the financial information communicated by the target's financial statements during the M&A due diligence process. This leads to a significant increase in the probability that the M&A deal will collapse.

Contradicting our expectations, our results reject *Hypothesis 2* and indicate that acquiring target firms with a greater magnitude of off-balance sheet leasing increases the post-acquisition efficiency of the M&A deal. Our results support the fact that acquirers make

[26] Cornaggia et al., 2013 find that a dominant form of off-balance sheet financing of U.S. companies comes from operating leases that have substantially increased from 84% of firms' total debt in 1980 to 711.6% by 2007.

more profitable acquisition decisions when they target firms with substantial off-balance sheet leasing activity.

Recall that following Wang and Xie (2009) and Martin and Shalev (2017), we measure post-acquisition performance by the average change of the merged entity return on assets one year before and after the M&A deal announcement. However, previous studies argue that firms with high levels of off-balance sheet leasing not only appear less leveraged, but also move a substantial amount of leased assets from their balance sheet. This results in an alteration of some financial ratios, such as Return on Assets (ROA), that increases significantly as the amount of reported assets decreases (Imhoff et al., 1991; Beattie et al., 1998; Cornaggia et al., 2013; Giner et al., 2019).Therefore, the positive and significant effect of targets' off-balance sheet leasing on the post-acquisition performance of the M&A deal is potentially explained by an improvement in the merged entity ROA as a result of the accounting treatment of operating leases.

Lim et al. (2017) document that firms with higher use of off-balance sheet leasing have lower borrowing costs. In addition, Cornaggia et al. (2013) show that US firms with significant use of off-balance sheet lease financing have lower debt to equity ratios, as substantial amounts of assets and their corresponding liabilities are kept off-balance sheet. This results in underestimating firms' true level of reported debt. These two empirical results indicate therefore that operating leases increase firms' credit capacity, as firms could use off-balance sheet lease financing to access additional funds without altering their level of reported debt. Consistent with this explanation, our results indicate that acquiring a firm with a greater magnitude of off-balance sheet leasing increases the debt capacity of the overall merged entity. In the long-term, this could contribute to an increase in the merged firm's operating performance.

3.7.2 Does the global financial crisis matter?

In the context of our analysis, the effect of the Great Financial Crisis (GFC) is important to consider for the following reasons. Off-balance sheet leasing is an example of a form of financial reporting that was, for several years, subject to criticism from financial statement users due to its inability to provide a transparent picture of the real value of a firm's assets and liabilities (Henderson and O'Brien, 2017). Alternatively, studies have shown that the GFC was partially triggered by the inability of accounting rules to provide

a transparent and accurate presentation of firms' value (Arnold, 2009; Bertomeu and Magee, 2011; Kothari and Lester, 2012).

In this section, we provide additional analysis to take into account the effect of the GFC on the likelihood that an announced M&A deal will be terminated before deal completion (Table 3.6). In addition, in Table 3.7, we examine whether the relationship between target firms' off-balance sheet leasing and the post-acquisition performance of the M&A deal varies if the M&A deal occurs before or after the financial crisis. Following Alexandridis et al. (2017), we subdivide our sample into two subperiods: pre-crisis subperiod (before 2009, inclusive) and post-crisis subperiod (after 2010).

Table 3.6 reports the logistic regression results of the effect of the GFC on the relationship between target pre-acquisition operating leases and the likelihood of M&A deal termination. Interestingly, Table 3.6 indicates that the effect of target firms' pre-acquisition off-balance sheet leasing on the likelihood of M&A termination is no longer significant during the post-financial crisis period. However, in line with the overall sample regression results, prior to 2009, the likelihood of M&A deal termination significantly increases with the level of the target firm's pre-acquisition off-balance sheet leasing. Considering the three measures of target firms' operating leases, coefficients on the variables *OBSL_T_Graham*, *OBSL_T_S&P*, and *OBSL_T_Moodys* are 13%, 10.7%, and 11.5%, respectively, and are significant at the 5% level of risk. Compared to the overall sample, this corresponds to a statistically significant improvement of 1.9% (0.130-0.111), 2.2% (0.107-0.085), and 0.825% (0.115-0.094), respectively.

Previous research has shown that the GFC period was characterised by an increase of off-balance sheet financing that questioned the relevance and faithfulness of firms' financial statements (Arnold, 2009). Cornaggia et al. (2013) find a substantial significant increase in U.S. firms' magnitude of off-balance sheet leasing in the period preceding the GFC. This high level of unreported debt contributes to a deterioration of firms' financial statement transparency. Beatty et al. (2010) find a firm's financial reporting quality decreases with its propensity to use operating leases.

Table 3-6 Effect of the Great Financial Crisis on the relationship between target pre-acquisition off-balance sheet leasing and the likelihood of M&A deal termination

	Overall sample	**Pre-crisis**	**Post-crisis**	**Overall sample**	**Pre-crisis**	**Post-crisis**	**Overall sample**	**Pre-crisis**	**Post-crisis**
OBSL_T_Graham	0.111**	0.130**	-0.008						
	(0.054)	(0.063)	(0.101)						
OBSL_T_S&P				0.085*	0.107**	-0.012			
				(0.046)	(0.054)	(0.076)			
OBSL_T_Moodys							0.094**	0.115**	-0.011
							(0.047)	(0.056)	(0.076)
Opaque_T	0.200***	0.211***	0.021	0.201***	0.212***	0.022	0.202***	0.213***	0.021
	(0.065)	(0.072)	(0.174)	(0.065)	(0.072)	(0.174)	(0.065)	(0.072)	(0.174)
Ind_Related	-0.032**	-0.041**	0.011	-0.032**	-0.041**	0.011	-0.032**	-0.041**	0.011
	(0.015)	(0.018)	(0.025)	(0.015)	(0.018)	(0.025)	(0.015)	(0.018)	(0.025)
Hostile	0.587***	0.579***	0.617***	0.587***	0.579***	0.617***	0.588***	0.579***	0.617***
	(0.029)	(0.035)	(0.046)	(0.029)	(0.035)	(0.046)	(0.029)	(0.035)	(0.046)
Multibid	0.240***	0.225***	0.311***	0.240***	0.225***	0.311***	0.240***	0.225***	0.311***
	(0.030)	(0.035)	(0.050)	(0.030)	(0.035)	(0.050)	(0.030)	(0.035)	(0.050)
Tender Offer	-0.090***	-0.113***	-0.025	-0.090***	-0.113***	-0.025	-0.090***	-0.113***	-0.025
	(0.020)	(0.024)	(0.031)	(0.020)	(0.024)	(0.031)	(0.020)	(0.024)	(0.031)
All_cash	-0.022	-0.023	0.034	-0.023	-0.024	0.033	-0.023	-0.024	0.034
	(0.021)	(0.026)	(0.032)	(0.021)	(0.026)	(0.032)	(0.021)	(0.026)	(0.032)
All_shares	-0.045**	-0.060**	-0.001	-0.045**	-0.060**	-0.001	-0.045**	-0.060**	-0.001
	(0.022)	(0.025)	(0.039)	(0.022)	(0.025)	(0.039)	(0.022)	(0.025)	(0.039)
Mixed	-0.064***	-0.111***	0.080**	-0.064***	-0.111***	0.080**	-0.064***	-0.111***	0.080**
	(0.024)	(0.030)	(0.034)	(0.024)	(0.030)	(0.034)	(0.024)	(0.030)	(0.034)
Size_T	0.013**	0.024***	-0.002	0.013**	0.024***	-0.002	0.013**	0.023***	-0.002
	(0.006)	(0.007)	(0.010)	(0.006)	(0.007)	(0.010)	(0.006)	(0.007)	(0.010)
TobinQ_T	0.008	0.011	-0.011	0.008	0.011	-0.011	0.008	0.011	-0.011
	(0.006)	(0.007)	(0.009)	(0.006)	(0.007)	(0.009)	(0.006)	(0.007)	(0.009)
ROA_T	0.081**	0.086**	0.003	0.080**	0.085**	0.003	0.078**	0.082**	0.003
	(0.033)	(0.039)	(0.056)	(0.033)	(0.039)	(0.056)	(0.033)	(0.039)	(0.056)
Leverage_T	0.007	-0.016	0.054	0.007	-0.016	0.054	0.007	-0.017	0.054
	(0.035)	(0.043)	(0.048)	(0.035)	(0.043)	(0.048)	(0.035)	(0.043)	(0.048)
Size_A	-0.032***	-0.036***	-0.007	-0.032***	-0.036***	-0.007	-0.032***	-0.036***	-0.007

	(0.005)	(0.006)	(0.009)	(0.005)	(0.006)	(0.009)	(0.005)	(0.006)	(0.009)
Leverage_A	0.026	0.041	-0.002	0.026	0.041	-0.002	0.026	0.040	-0.002
	(0.041)	(0.050)	(0.063)	(0.041)	(0.050)	(0.063)	(0.041)	(0.050)	(0.063)
TobinQ_A	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
	(0.005)	(0.005)	(0.009)	(0.005)	(0.005)	(0.009)	(0.005)	(0.005)	(0.009)
FCF_A	-0.103**	-0.098*	-0.129	-0.103**	-0.098*	-0.129	-0.103**	-0.098*	-0.129
	(0.051)	(0.058)	(0.111)	(0.051)	(0.058)	(0.111)	(0.051)	(0.058)	(0.111)
_cons	0.270***	0.273***	0.076	0.275***	0.277***	0.077	0.276***	0.279***	0.077
	(0.037)	(0.044)	(0.072)	(0.037)	(0.044)	(0.071)	(0.036)	(0.044)	(0.071)
Obs.	1711	1331	380	1711	1331	380	1711	1331	380
Pseudo R-squared	0.312	0.299	0.444	0.311	0.299	0.444	0.311	0.299	0.444

Notes. This table illustrates the effect of the GFC on the relationship between target firms' pre-acquisition off-balance sheet leasing and the likelihood of M&A deal termination. Following Alexandridis et al. (2017), we select the year 2009 as a breaking point between the pre- and post-financial crisis era. Our sample covers 1,711 U.S. M&As announced from 1983-2018. The model dependent variable is a dummy variable that takes a value of one if the announced M&A deal is subsequently terminated and zero otherwise. Robust sstandard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level of risk, respectively. All variable definitions are provided in Appendix B.

Table 3-7 Effect of the Great Financial Crisis on the relationship between target pre-acquisition off-balance sheet leasing and M&A deal post-acquisition performance

	Overall sample	**Pre-crisis**	**Post-crisis**	**Overall sample**	**Pre-crisis**	**Post-crisis**	**Overall sample**	**Pre-crisis**	**Post-crisis**
OBSL_T_Graham	0.024	0.014	0.073**						
	(0.019)	(0.022)	(0.033)						
OBSL_T_S&P				0.018	0.011	0.050**			
				(0.016)	(0.019)	(0.025)			
OBSL_T_Moodys							0.019	0.011	0.050**
							(0.016)	(0.020)	(0.025)
Opaque_T	-0.045*	-0.056*	0.041	-0.045	-0.056*	0.048	-0.044	-0.056*	0.048
	(0.027)	(0.030)	(0.070)	(0.027)	(0.030)	(0.070)	(0.027)	(0.030)	(0.070)
Ind_Related	0.004	0.009	-0.007	0.004	0.009	-0.008	0.004	0.009	-0.007
	(0.005)	(0.006)	(0.008)	(0.005)	(0.006)	(0.008)	(0.005)	(0.006)	(0.008)
Hostile	-0.019	-0.036*	0.040	-0.020	-0.036*	0.039	-0.019	-0.036*	0.039
	(0.018)	(0.021)	(0.029)	(0.018)	(0.021)	(0.029)	(0.018)	(0.021)	(0.029)
Multibid	-0.010	-0.008	-0.006	-0.010	-0.008	-0.007	-0.010	-0.008	-0.007
	(0.012)	(0.014)	(0.022)	(0.012)	(0.014)	(0.022)	(0.012)	(0.014)	(0.022)
Tender Offer	0.002	0.000	0.002	0.002	0.000	0.002	0.002	0.000	0.002
	(0.006)	(0.008)	(0.010)	(0.006)	(0.008)	(0.010)	(0.006)	(0.008)	(0.010)
All_cash	0.003	0.008	-0.006	0.003	0.008	-0.007	0.003	0.008	-0.007
	(0.007)	(0.008)	(0.011)	(0.007)	(0.008)	(0.011)	(0.007)	(0.008)	(0.011)
All_shares	0.003	0.007	-0.018	0.003	0.007	-0.019	0.003	0.007	-0.019
	(0.007)	(0.008)	(0.014)	(0.007)	(0.008)	(0.014)	(0.007)	(0.008)	(0.014)
Mixed	-0.005	-0.005	-0.007	-0.005	-0.005	-0.007	-0.005	-0.005	-0.007
	(0.008)	(0.010)	(0.012)	(0.008)	(0.010)	(0.012)	(0.008)	(0.010)	(0.012)
Size_T	-0.000	-0.001	0.005	-0.000	-0.001	0.004	-0.000	-0.001	0.004
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)
TobinQ_T	-0.003	-0.002	-0.004	-0.003*	-0.002	-0.004	-0.003	-0.002	-0.004
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)
ROA_T	-0.087***	-0.093***	-0.074***	-0.088***	-0.093***	-0.074***	-0.088***	-0.093***	-0.073***
	(0.011)	(0.013)	(0.019)	(0.011)	(0.013)	(0.019)	(0.011)	(0.013)	(0.019)
Leverage_T	-0.006	0.013	-0.061***	-0.006	0.013	-0.061***	-0.006	0.013	-0.061***
	(0.011)	(0.014)	(0.016)	(0.011)	(0.014)	(0.016)	(0.011)	(0.014)	(0.016)
Size_A	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.001	0.000

	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)
Leverage_A	0.006	0.016	-0.027	0.006	0.016	-0.028	0.006	0.016	-0.029
	(0.014)	(0.017)	(0.021)	(0.014)	(0.017)	(0.021)	(0.014)	(0.017)	(0.021)
TobinQ_A	-0.003*	-0.004**	0.001	-0.003*	-0.004**	0.000	-0.003*	-0.004**	0.000
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)
FCF_A	-0.224***	-0.203***	-0.372***	-0.224***	-0.203***	-0.372***	-0.224***	-0.203***	-0.373***
	(0.019)	(0.021)	(0.040)	(0.019)	(0.021)	(0.041)	(0.019)	(0.021)	(0.041)
_cons	0.018	0.009	0.017	0.020	0.010	0.021	0.020	0.010	0.021
	(0.013)	(0.016)	(0.025)	(0.013)	(0.015)	(0.025)	(0.013)	(0.015)	(0.025)
Obs.	1356	1054	302	1356	1054	302	1356	1054	302
R-squared	0.223	0.216	0.406	0.223	0.216	0.404	0.223	0.216	0.404

Notes. This table illustrates the effect of the GFC on the relationship between target firms' pre-acquisition off-balance sheet leasing and M&A deal post-acquisition performance. Following Alexandridis et al. (2017), we select the year 2009 as a breaking point between the pre- and post-financial crisis era. Our sample covers 1,711 U.S. M&As announced and completed from 1983-2018. The model dependent variable is a continuous measure of the M&A post-acquisition performance. Robust standard errors are reported in parentheses. ***, **, and * denotes statistical significance at the 1%, 5%, and 10% level of risk, respectively. All variable definitions are provided in Appendix B.

In line with these previous studies, our findings indicate a positive and significant impact of the magnitude of target firms' off-balance sheet leasing on the likelihood of M&A deal termination during the period preceding the GFC. However, the aftermath of the GFC is characterised by an increased awareness regarding the importance of better financial reporting transparency, particularly, off-balance sheet reporting (Bertomeu and Magee, 2011; Kothari and Lester, 2012). This potentially explains our reported results in the post-crisis period where the relationship between the target's off-balance sheet leasing and the likelihood of the M&A deal termination is no longer significant.

Table 3.7 presents the OLS regression results concerning the impact of the GFC on the relationship between target pre-acquisition off-balance sheet leasing and post-acquisition performance. Table 3.7 reports that acquiring firms with a high level of off-balance sheet leasing generates significant and positive post-acquisition performance during the post-financial crisis period. In Table 3.7, coefficients on the variables *OBSL_T_Graham* and *OBSL_T_Moodys* are 7.3% and 5%, respectively, and are significant at the 5% level of risk. Following the S&P proxy, the impact of the variable *OBSL_T_S&P* on the post-acquisition performance of an M&A deal is 5% and significant at the 5% level. This result is in accordance with Alexandridis et al. (2017) who find a significant post-acquisition gain for acquirer shareholders during the post-financial crisis period.

In addition, Table 3.7 indicates that after the financial crisis, post-acquisition gains are characterised by a significantly low level of acquirer free cash flow. In Table 3.7, the variable *FCF_A* has a significant (1% level of risk) and negative impact on the merged entity's post-acquisition performance.

In sum, our findings indicate that M&A deals announced and completed after the GFC create value if the target has a significant amount of off-balance sheet leasing liabilities and the acquirer has a low level of free cash flow that signals higher financial constraints. This result is in line with previous studies that indicate firms with significant financial constraints are more likely to use off-balance sheet lease financing (Graham et al., 1998; Eisfeldt and Rampini, 2009; Lim et al., 2017). Lim et al. (2017) find that the use of off-balance sheet leasing increases the debt capacity of financially constrained firms. Our results indicate an improvement in the merged entity post-acquisition performance that is potentially the result of an increase in the overall debt capacity of the entity.

3.7.3 Robustness checks

Recall from Section 3.3.1 that in order to estimate the capitalised amount of the target firms' future off-balance sheet leasing commitments, we set the discount rate at 10%. We conduct our analysis again using discount rates of 3% and 6%. The results are presented in Tables B.4.1- B.4.4 of Appendix B.4. Our findings are, on average, robust to the choice of the discount rate.

In addition, in Table B.4.5 and B.4.6 of Appendix B.4, we consider an alternative accrual-based proxy of firms' accounting statement opacity. In accordance with McNichols and Stubben (2015) and Stubben (2010), we define discretionary revenues ($DisRev_{it}$) as the absolute value of the residuals from the following equation:

$$\Delta AR_{it} = \beta_0 + \beta_{1i}\Delta REV_{i,t} + \varepsilon_{i,t} \quad (10)$$

In Equation (10), the dependent variable ΔAR_{it} is the annual variation of firm *i*'s accounts receivable observed at year *t*. The explanatory variable represents the change in firm *i*'s revenues observed at year *t*. ε_{it} is the regression model error term. In a second step, we define the variable Opaque2_T as the absolute value of discretionary revenues observed one year before the M&A announcement. Higher values of the variable *Opaque2_T* signal greater accounting "window dressing" of the target accounting statements in the year prior to the acquisition.

As reported by Table B.4.6, our main results are robust to the choice of the target firms' accounting statement opacity (*Opaque2_T*). The likelihood of M&A deal termination increases significantly with a target firm's off-balance sheet leasing, as well as the opacity of its accounting statements.

3.8 Conclusions

This chapter investigate why M&A deals fail. We consider two aspects of M&A deal failure. First, we analyse why some announced M&A deals are terminated before the merger completion date. Additionally, we investigate which determinants explain why certain M&A deals fail to generate value post-acquisition.

Prior studies document that M&A's fail to create value for their shareholders due to the poor accounting quality of the target firm (Raman et al., 2013; Skaife and Wangerin, 2013; Marquardt and Zur, 2014; McNichols and Stubben, 2015; Martin and Shalev, 2017). Skaife and Wangerin (2013) identify a measure of low accounting quality that takes into account the target firm's off-balance sheet environment and finds that the likelihood an announced M&A deal is subsequently terminated increases with the significance of its off-balance sheet liabilities. Our chapter extends Skaife and Wangerin (2013) and offers new evidence regarding the consequences of target firms' off-balance sheet leasing magnitude on the likelihood of M&A deal termination.

We find that M&A deals are more likely to be terminated if the target firm's financial statements exhibit a significant amount of off-balance sheet leasing liabilities prior to the M&A's announcement year. Our study suggests that the high magnitude of the target's off-balance sheet leasing commitments acts as a negative information signal during the transactional due diligence process decreasing the trustworthiness of the target financial statements and leading, ultimately, to the M&A deal termination where the acquirer withdraws from the acquisition process.

Interestingly, we also find that the relationship between the target firm's off-balance sheet leasing and the likelihood that an announced M&A deal will ultimately be terminated is only significant during the pre-financial crisis period. In other terms, our findings indicate that in the context of financial reporting opacity that characterised the pre-crisis period (Arnold, 2009; Bertomeu and Magee, 2011; Kothari and Lester, 2012), heavy usage of off-balance sheet leasing by US companies had a significant negative impact on acquisition-investment decisions.

Furthermore, our study shows that M&A deals are more likely to create value for the shareholders if the acquired target exhibit a great magnitude of off-balance sheet leasing prior the acquisition announcement. In line with Alexandridis et al. (2017), we also find that this positive and significant post-acquisition performance is only observed for the post-crisis period. This result, while in contrast with our initial predictions, is potentially explained by the fact that off-balance sheet leasing overestimates some firms' measure of performance such as return on assets as the company generate profit from an asset that is not shown on the balance sheet (Imhoff et al., 1991; Beattie et al., 1998; Cornaggia et al., 2013; Giner et al., 2019).

This study has also an implication on accounting standards setters as we provide evidence supporting the benefit of the new leasing international accounting regulation (IFRS 16 *leases*), which require all operating leases commitments to be brought into the balance sheet starting from January 2019. We show that this new leasing regulation will improve firm's decision making in the context of corporate acquisition by improving the transparency of target firms' financial statements provided during the process of due diligence, hence reducing the likelihood of M&A deal termination. Therefore, we provide evidence supporting the International Accounting Standard Board's (IASB) proclamation that the new leasing regulation will improve firms' decision making by reducing opacity about companies' financial liabilities (IASB, 2016).

Chapter 4 Do firms use more off-balance sheet leasing when approaching a debt covenant violation?

4.1 Abstract

In the context of private loan contracts, we investigate whether firms approaching financial covenant violations have greater incentives to engage in off-balance sheet leasing. We find that the likelihood of breaching an income-based covenant ratio is considerably high for borrowing firms with a significant exposure to off-balance sheet lease financing. We also find that these firms are particularly highly leveraged, low performing and facing tight pay-out restrictions. This suggests that a significant use of off-balance sheet lease financing allows managers of highly constrained firms to access additional funds without breaching costly debt covenants. Additional analysis indicates no significant relationship between a firm's exposure to off-balance sheet leasing and the event of actual debt covenant violation. This indicates that off-balance sheet lease financing appears to be a successful accounting "window dressing" tool that leads to actual avoidance of debt covenant violation.

4.2 Introduction

When initiating a debt contract, a lender uses several sources of information to assess the creditworthiness of a potential borrower. After the debt contract issuance, the lender monitors the borrower's behaviour through debt covenants. The purpose of debt covenants is to trigger renegotiation (and potential termination) if the thresholds imposed by the terms of the contract are violated (Nini, Smith and Sufi, 2012; Demerjian and Owens, 2016).

Watts and Zimmerman (1986) suggest that managers with contracting incentives, such as debt covenant restrictions, tend to manipulate their financial statements. More recent studies provide evidence supporting this hypothesis, but they primarily focus on managers' incentives to use earning management tools to avoid debt covenant violations (Defond and Jiambalvo, 1994; Dichev and Skinner, 2002; Franz, HassabElnaby, and Lobo, 2014; Fan, Thomas, and Yu, 2019; Malikov, Coakley, and Manson, 2019; Demerjian, Donovan, and Western, 2020). Moreover, firms with a higher likelihood of financial misstatement and firms prone to window dressing are more likely to use off-balance sheet lease financing as opposed to traditional debt (Dechow et al., 2011).

Studies regarding the anticipated impact of the new leasing accounting rule (IFRS 16 *leases*) argue that firms with significant operating lease activity overestimate their true performance and underestimate their level of debt and risk (Imhoff et al., 1991; Beattie et al., 1998; Cornaggia et al., 2013; Giner et al., 2019). Based on this observation, two studies, Paik et al. (2015) and Altamuro, Johnston, Pandit, and Zhang (2014) investigate how the usefulness of accounting information for debt contracting purposes is affected by off-balance sheet lease financing. Both studies suggest that lenders already account for the off-balance sheet leasing of the borrowing company. Paik et al. (2015) find that lenders avoid the use of balance-sheet based financial covenants if the borrowing company has a substantial amount of off-balance sheet leasing. Altamuro et al. (2014) suggest that creditors take into account a firm's off-balance sheet activity through pricing as reflected in higher loan spreads. However, the results of these studies are based on the frequency of financial covenants used in debt contracts and do not provide a complete

picture as to how borrowing firms could potentially manipulate their reported financial ratios in the specific context of proximity to a financial covenant violation.

This study seeks to investigate whether borrowing firms with outstanding private debt contracts that stipulate restrictions on financial ratios (i.e., covenants) are more likely to use off-balance sheet leasing when raising new capital. We posit that significant use of off-balance sheet lease financing enables managers of borrowing companies to manipulate their true level of reported financial ratios thereby avoiding financial covenant violations.

Consistent with our expectations, we find that the propensity for being close to financial covenant violations is more significant for firms belonging to industries with significantly higher levels of off-balance sheet leasing commitments. We also find that the relationship between the proximity to financial covenants violations and the high use of off-balance sheet financing is specifically significant when the borrowing company is already burdened by high levels of debt. Thus, our study suggests that managers of highly leveraged firms with a higher level of financial constraints and close to violating their financial covenant threshold have a greater reporting incentive to use off-balance sheet lease financing.

We test these predictions using a sample of 861 U.S. companies with outstanding loan contracts from 2002-2018. Following Paik et al. (2015), we adopt an industry level approach by comparing loan agreements in industries with high levels of off-balance sheet leasing as opposed to firms in industries with less off-balance sheet leasing.

In the next section, we outline prior studies in the literature before presenting our hypothesis. Section 3 presents the research design and sample selection. Findings and discussions are outlined in Section 4. Additional analysis and robustness tests are presented in Sections 5 and 6, respectively. Section 7 provides our conclusions.

4.3 Research Background and Hypothesis

It is common practice for lenders to impose financial covenants within the debt contract in order to mitigate agency costs. The goal of these financial restrictions is to keep borrowing companies' financial indebtedness and other performance indicators under

careful review. The primary source of financial covenants data is the borrowing company's financial statements. Borrowers' closeness to thresholds set by the loan agreement is likely to be affected by their accounting choices and practices (Armstrong, Guay, and Weber, 2010). Moreover, the accounting literature widely argues that the use of off-balance sheet lease financing significantly affects firms' reported assets and liabilities (Imhoff et al., 1991; Cornaggia et al., 2013; Giner et al., 2019).

In the context of debt contracting, regulators seem to be aware of firms' use of off-balance sheet leasing for contractual purposes (SEC, 2005). However, to the best of our knowledge, only two studies empirically test the effect of off-balance sheet leasing on the accounting information used in debt covenants (Demerjian, 2011; Paik et al., 2015). Demerjian (2011) and Paik et al. (2015) analyse how the use of off-balance sheet leasing is affected by the type and frequency of financial covenant ratios in the loan agreement. In this study, we advance this argument by studying how the closeness to a financial covenant breach influences borrowing firms' use of off-balance sheet leasing. We also extend Armstrong et al. (2010) by analysing whether the use of off-balance sheet leasing affects the reliability of the accounting information in debt contracts, particularly for borrowing firms close to breaching their financial covenant threshold.

Prior studies on firms' off-balance sheet leasing activity show that under the old International Accounting Standard 17 (IAS 17 *leases*), the use of operating leases (or off-balance sheet lease financing) has substantially increased over time, while the use of finance leases (or on-balance sheet leasing) has consistently decreased (Imhoff et al., 1991; Cornaggia et al., 2013). The off-balance sheet treatment of operating leases is a determining factor in this trend. Managers appear to exploit loopholes within the old IAS 17 *leases* standard in order to underestimate a company's true level of debt and/or overestimate its accounting performance (Beatty et al., 2010; Cornaggia et al., 2013; Giner et al., 2019). In addition, Rauh and Sufi (2012) and Eisfeldt and Rampini (2009) demonstrate that off-balance sheet leasing increases a firm's debt capacity without altering its reported indebtedness.

From a debt contracting perspective, prior research indicates that covenant violations are costly to the borrowing firm. Roberts and Sufi (2009) argue that covenant violations could potentially trigger an early call for loan repayment, a decrease in the accessibility of

future loans, and further limitations on new debt issuance. Additionally, debt covenant violations are costly to the borrowing firm as the lender could require restrictions on capital expenditures (Chava and Roberts, 2008) and limitations on shareholders dividend pay-outs (Nini et al., 2012). More recent studies suggest that covenant violations indicate greater uncertainty regarding the borrowing company's future growth and are perceived as a negative signal by financial market participants (Gao, Khan, and Tan, 2017). Finally, covenant violations result in tighter auditor monitoring that reflects a deterioration of the borrowing firm's financial reporting quality (Bhaskar, Krishnan, and Yu, 2017; Jiang and Zhou, 2017).

Therefore, to avoid costly covenant violations, prior studies indicate that managers have significant incentives to manipulate a firm's reported accounting information through various type of earning management techniques. Prior evidence indicates that borrowing companies close to violation of a financial covenant are more likely to engage in real earnings management (Sweeney, 1994; Dichev and Skinner, 2002). Franz et al. (2014) demonstrate that firms use both real earnings management and earnings accruals management when they are close to breaching a debt covenant. More recently, Fan et al. (2019) find that when borrowing companies are close to violating one of the EBITDA-related covenants stated in the loan contract, they are more likely to engage in classification shifting, which is another example of using earnings management techniques.

Beatty et al. (2010) indicate that firms' use of off-balance sheet lease financing increases with the likelihood that their financial statements are manipulated through earning management. Correspondingly, off-balance sheet financing is also an example of how managers can exploit accounting choices for window dressing purposes (Dechow et al., 2011).[27] This chapter extends prior studies regarding the relationship between the proximity to financial covenant violation and managers incentives to manipulate reported accounting information through earnings management.

[27] In the 2005 SEC (Securities and Exchange Commission) report, accounting regulators recognise the implication of the use of off-balance sheet leasing on firms' accounting information transparency and argue that managers use off-balance sheet leasing as a form of accounting "window dressing".

Central to our analysis, Demerjian (2011) and Paik et al. (2015) demonstrate that borrowing firms' level of off-balance sheet leasing has a significant impact on the nature and source of accounting information that lenders consider when selecting the type of financial covenant ratios that would be included in the loan contract. Both studies argue from a lender's perspective with conflicting results. Demerjian (2011) finds that regardless as to the source of the accounting information included in the financial covenants (either balance-sheet or income-statement based covenants), lenders are less likely to include financial covenants in the debt contract if the borrowing firm has a significant off-balance sheet leasing commitment.[28] Demerjian (2011) suggests that borrowing companies' use of off-balance sheet financing deteriorates the monitoring power of any type of covenants that would be based on accounting information. This is consistent with the view that because most accounting standards are balance sheet oriented, managers' willingness to take advantage of accounting loopholes and the manipulation of accounting numbers for contracting purposes has increased over time thereby decreasing the usefulness of balance-sheet based covenants in debt contracting (Benston, Carmichael, Demski, Dharan, Jamal, Laux, Rajgopal, and Vrana, 2007; Dichev, 2008; Kothari, Ramanna, and Skinner, 2010; Watts, 2006).

In contrast to Demerjian (2011), Paik et al. (2015) find that borrowing firms' level of off-balance sheet leasing has a significant negative impact on the likelihood of including balance-sheet based covenants in the debt contract. Nevertheless, the use of income-statement based covenants in the debt contract is highly significant when the lender uncovers significant off-balance sheet leasing commitments in the borrower's notes to their financial statements. Paik et al. (2015) imply that the lender expects that financial ratios based on balance sheet information are more likely to be biased by the borrowing company's use of off-balance sheet lease financing.

In this chapter, we structure our research design at an industry level for the following reasons. First, past studies indicate that accounting information retrieved from financial

[28] Following the classification suggested by Demerjian (2011), income statement covenant ratios include Interest Coverage, Cash Interest Coverage, Fixed Charge Coverage, Debt Service Coverage, Debt to EBITDA, and Senior Debt to EBITDA. Balance sheet covenants ratios include the leverage ratio, the senior leverage ratio, debt to tangible net worth, the current ratio, and the quick ratio. Fan et al. (2019) follow the same classifications as Demerjian (2011), but identify income statement covenants as EBITDA related ratios and balance-sheet based covenants as non-EBITDA related ratios.

statements is substantially managed in firms belonging to industries with a significantly important use of off-balance sheet financing (Imhoff et al., 1993; Beattie et al., 2000a, 2000b; Cornaggia et al., 2013). In addition, Caskey and Ozel (2019) find that the potential reporting advantage of off-balance sheet leasing on financial ratios is achievable only if off-balance sheet lease financing is used in a significant way. Thus, any significant relationship between the borrowing firm's off-balance sheet activity and financial covenants proximity is likely to be identified only in high leasing industries. Finally, Rauh and Sufi (2012) confirm that firms' off-balance sheet leasing significantly cluster by industry.

This chapter aims to test whether managers of borrowing firms close to (far from) financial covenants violation are more likely (less likely) to use significantly off-balance sheet lease financing.

4.4 Sample selection and research design

4.4.1 Sample selection

Our study's goal is to identify a potential relationship between borrowing firms' closeness to financial covenant violation and the use of off-balance sheet lease financing. We begin our sample selection process by looking specifically at U.S. borrowing companies with outstanding debt contracts and where specific textual information about the debt contract is available on DealScan data files. As reported by Table 3.1, our initial sample includes 3,053 U.S. borrowing companies observed from 2002-2018. Among this initial sample, 1,946 companies had textual information regarding financial covenants. We manually retrieve financial covenant threshold values from textual information on the loan contract. In addition, we retrieve financial and accounting information from the Compustat database. We merge DealScan and Compustat data using the conversion link table provided by Chava and Roberts (2008). We exclude duplicate observations, as well as observations with missing values on total assets, total sales, common shares outstanding, and closing share prices. This results in a final sample of 9,131 firm-year observations from 2002-2018.

Table 4-1 Sample selection

	Number of firms
Initial Sample: U.S. borrowing companies observed from 2002-2018 for which textual information on the loan contract is available on DealScan.	**3,053**
We exclude companies where no financial covenant information is revealed in the textual detail provided by DealScan.	(1,946)
We exclude observations with missing values on total assets, total sales, common shares outstanding, and closing share price, as well as duplicated observations.	(246)
Final sample	**861**

Notes:

The final sample of 861 U.S. companies corresponds to an unbalanced panel of 9,131 firm-year observations from 2002-2018. Data on financial covenants is retrieved manually from textual information on debt contracts available at DealScan (private loan contracts). We accessed DealScan through WRDS (Wharton Research Data Services) third party research data. First, we identify non-financial institutions with specific textual information about the loan contract. This data is available on DealScan under the variable "Comment" within the file "Package". Next, we use Stata coding to identify observations where the variable "Comment" specifies textual information about financial covenants stated in the loan contract. We used "financial covenants," "financial ratios," and "key financial ratios" as key words to flag observations where the variable "Comment" contains financial covenants information. Finally, we manually retrieve financial covenant threshold values specified in the "Comment" variable.

4.4.2 Accounting for firms' off-balance sheet leasing

This study investigates whether borrowing firms' use of off-balance sheet lease financing increases with the likelihood of approaching a financial covenant violation. Our variable of interest is a measure of borrowing firms' use of off-balance sheet leasing. From a lessee's perspective, we follow the methodology adopted by Standard and Poor (S&P), which estimates firms' off-balance sheet leasing commitments as the sum of rental expenses and the present value of all future minimum lease payments including lease commitments due beyond the fifth year.[29]

Therefore, for each borrowing company *i* observed during the year *t*, we define the following equation:

$$OBSL\_SP_{i,t} = Rental\ Expense_0 + \sum_{t=1}^{5} \frac{MLP_t}{(1+K_d)^t} + \sum_{t=6}^{6+Addyrs} \frac{EMLP_t}{(1+K_d)^t} \quad (1)$$

[29] Standard & Poor's (S&P) 2008, Corporate Ratings Criteria. New York, NY: Standard & Poor.

Where *Rental Expense*$_0$ reports the borrowing firm current rental expense, MLP_t is the minimum lease payments due in the next five years, *Addyrs* refers to the remaining years in the life of the off-balance sheet lease contract, and *EMLPt* is the estimated annuity payable after the fifth year. As in Lim et al. (2017), we first estimate the remaining years in the off-balance sheet lease contract (*Addyrs= Thereafter/MLP5*). Then, we estimate the annual minimum lease payment due from the fifth year to the end of the lease life as *Thereafter/Addyrs*. Finally, K_d is the discount rate and is set at 10% in accordance with prior studies (Demerjian, 2011; Cornaggia et al., 2013; Altamuro et al., 2014; Paik et al., 2015; Lim et al., 2017).[30]

4.4.3 Definition of financial covenant closeness

Our study posits that when borrowing firms are close to violating the threshold on financial covenants stipulated in their debt contract, their managers are more likely to use significantly off-balance sheet leasing as a means to reduce the reported level of debt and improve their perceived financial health. Thus, our study dependent variable is a measure of the borrowing firms' closeness to a financial covenant violation.

In a first step, to account for financial covenant closeness, we follow Franz et al. (2014) and Fan et al. (2019) and identify a borrowing company as close to a financial covenant violation if the reported financial ratio is within 15% of the value of the threshold imposed in the debt contract. To estimate borrowing firms reported financial ratios, we follow the definitions suggested by Demerjian and Owens (2016).[31] The threshold ratio corresponds to the limit value stipulated in the debt contract collected from the DealScan database.

Financial covenants' objectives are to monitor the financing and investment decisions of the borrowing company (Nini et al., 2012; Demerjian and Owens, 2016). Therefore, the use of financial covenants seeks to limit any adverse effect that the lender could potentially suffer from as a result of a borrower's bad decision. The majority of financial covenants are expressed either in "Maximum" or "Minimum" terms. For *Maximum* value

[30] Please refer to Table 4.11 for a robustness test of the study results using alternative discount rates to estimate the present value of future minimum lease payments (3% and 6%).
[31] Appendix A reports the definitions and formulas applied to estimated reported financial covenant values (Demerjian, 2011; Demerjian and Owens, 2016).

ratios, for each year *t*, we flag a company *i* as close to financial covenant violation if the reported ratio value is equal or greater than the threshold ratio *or* the reported ratio value is equal or greater than 85% of the threshold ratio. Similarly, for *Minimum* value ratios, we identify a borrowing company as close to financial covenant violation if the reported ratio value is equal or less than the threshold ratio *or* the reported ratio value is equal or less than 115% of the threshold ratio.

In a second step, we follow Demerjian (2011) and classify borrowing firms' financial covenants into two main categories: balance-sheet based covenants (BSCOV) and income-statement based covenants (ISCOV).[32] We define two indicator variables that capture borrowing firms' closeness or proximity to financial covenant violation: (1) the variable *BSCOVclose* takes a value of one if, during a year *t*, a borrowing firm *i* has at least one balance-sheet based covenant close to violation and is zero otherwise; and (2) the variable *ISCOVclose* takes a value of one if, during a year *t*, a borrowing firm *i* has at least one income-statement based covenant close to violation and is zero otherwise.

4.4.4 Model specifications

When a borrowing company is judged as highly exposed to off-balance sheet leasing use, Paik et al. (2015) argue that a lender's choice of the type of financial covenant to include in the loan contract depends upon the nature and source of the accounting information provided by the financial covenant. Paik et al. (2015) argue that lenders would avoid the use of balance-sheet based financial covenants in favour of income statement covenants if they estimate that the borrowing firm's exposure to off-balance sheet leasing is significantly high, which undermines the reliability of the accounting information provided by the balance sheet. In contrast, Demerjian (2011) finds that the usefulness of the accounting information provided by either balance-sheet based covenants or income-statement based covenants is likely to decrease if the lender estimates that the borrowing company holds a significant amount of unreported off-balance sheet liabilities.

Paik et al.'s (2015) findings join Christensen and Nikolaev's (2012) view that because of its timely nature, lenders perceive accounting information provided by the income

[32] Please refer to Appendix A for a presentation of the classification of firms' financial covenants into balance-sheet based covenants and income-statement based covenants in line with Demerjian (2011).

statement to be more accurate and freer from manipulation when compared to balance-sheet based information. However, income-statement based covenants are primarily EBITDA related (Fan et al., 2019). Prior studies indicate that accounting firms' off-balance sheet leasing is likely to overestimate performance indicators, such as those based on EBITDA figures (Cornaggia et al., 2013; Giner et al., 2019).

Both Demerjian (2011) and Paik et al. (2015) base their findings on the frequency of either balance sheet or income-statement based covenants stated in the debt contract. It is not clear whether after the initiation of the debt contract, borrowing firms approaching financial covenant violations would have greater incentives to use off-balance sheet leasing to manipulate their reported accounting information. Therefore, building on Demerjian (2011) and Paik et al. (2015), we posit that firms close to violating financial covenants (balance sheet or income-statement based) have greater incentives to use off-balance sheet financing.

To test our main hypothesis, we define the following logistic regression models:

$$\begin{aligned}\mathrm{BSCOV}close = {} & \beta_0 + \beta_1 High\_OBSLease_{it} + \beta_2 VR_{it} + \beta_3 Leverage_{it} + \beta_4 Size_{it} \\ & + \beta_5 MTB_{it} + \beta_6 ROA_{it} + \beta_7 Loss_{it} + \beta_8 Advert\_expense_{it} \\ & + \beta_9 RD\_expense_{it} + \beta_{10} Tangibility_{it} + \beta_{11} Zscore_{it} \\ & + \beta_{12} Div\_dummy_{it} + \beta_{13} Loan\_Size_{it} \\ & + \beta_{14} Dividend\_restriction_{it} + \beta_{15} Maturity_{it} + \beta_{16} Secured_{it} \\ & + \varepsilon_{it}\end{aligned} \tag{2}$$

$$\begin{aligned}\text{ISCOV}close = {} & \beta_0 + \beta_1 High\_OBSLease_{it} + \beta_2 VR_{it} + \beta_3 Leverage_{it} + \beta_4 Size_{it} \\ & + \beta_5 MTB_{it} + \beta_6 ROA_{it} + \beta_7 Loss_{it} + \beta_8 Advert\_expense_{it} \\ & + \beta_9 RD\_expense_{it} + \beta_{10} Tangibility_{it} + \beta_{11} Zscore_{it} \\ & + \beta_{12} Div\_dummy_{it} + \beta_{13} Loan\_Size_{it} \\ & + \beta_{14} Dividend\_restriction_{it} + \beta_{15} Maturity_{it} + \beta_{16} Secured_{it} \\ & + \varepsilon_{it}\end{aligned} \quad (3)$$

In Equation (2), *BSCOVclose* is a dummy variable that takes a value of one if the borrowing company is close to violating at least one of the balance-sheet based financial covenants indicated in the debt contract and is zero otherwise. Similarly, in Equation (3), *ISCOVclose* is an indicator variable that takes a value of one if the borrowing firm is close to breaching at least one of the income-statement based financial covenants stated in the debt contract and is zero otherwise.

In Equations (2) and (3), we also control for firm-specific and loan-specific variables that have a potential impact on the proximity to financial covenant violations. Following Demerjian (2011), we account for the balance sheet volatility ratio (*VR*). This variable measures to what extent accounting information published in the balance sheet has been affected by approximations and accounting "window dressing"s from managers. We also control for additional firm and loan specific variables that prior studies have identified as significant in explaining the use of debt covenants (Demerjian, 2011; Costello and Wittenberg-Moerman, 2011; Paik et al., 2015). Appendix B reports the definitions and formulas of the study variables.

4.5 Empirical results

4.5.1 Descriptive statistics

We test our main hypothesis by performing an Ordinary Least Square (OLS) regression on the logit model presented in Equations (2) and (3). Table 4.2 reports the correlation matrix of the study independent variables. It is important to recall that one of the assumptions of the OLS regression is the absence of multicollinearity between the independent variables (Wooldridge, 2010). Accordingly, with the exception of the correlation coefficients between the variables *Loan_Size* and *Size*, Table 4.2 reports that the majority of the independent variables have low correlation coefficients.[33] Therefore, to account for the effect of the potential multicollinearity issue arising from the correlation between the variables *Loan_Size* and *Size* (0.647), we consider different model specifications by dropping the highly correlated variables.

[33] It is common practice in empirical studies to consider two variables as weakly correlated if the correlation coefficient is below 0.5 (Greene, 2008; Wooldridge, 2010).

Table 4-2 Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) High_OBSLease	1.000															
(2) VR	0.019	1.000														
(3) Leverage	0.062	0.046	1.000													
(4) Size	-0.012	0.020	-0.077	1.000												
(5)MTB	-0.008	-0.030	-0.312	0.266	1.000											
(6) ROA	0.058	0.031	-0.006	0.314	0.235	1.000										
(7) Loss	-0.014	0.036	0.183	-0.387	-0.190	-0.422	1.000									
(8) Advert_expense	0.092	0.027	0.001	0.072	0.106	0.061	-0.018	1.000								
(9) RD_expense	-0.186	-0.033	-0.205	-0.087	0.211	-0.402	0.160	-0.046	1.000							
(10) Tangibility	0.045	-0.019	0.273	0.080	-0.107	0.115	0.022	-0.065	-0.213	1.000						
(11) Zscore	0.046	-0.025	-0.334	-0.059	0.391	-0.111	-0.093	0.041	0.202	-0.179	1.000					
(12) Div_dummy	-0.062	0.055	-0.074	0.462	0.051	0.164	-0.258	0.027	-0.151	0.093	0.017	1.000				
(13) Loan_Size	0.044	0.080	0.220	0.647	-0.026	0.214	-0.189	0.064	-0.231	0.175	-0.132	0.358	1.000			
(14) Dividend_restriction	-0.004	-0.020	0.066	-0.339	-0.098	-0.066	0.115	-0.062	0.037	-0.026	0.004	-0.284	-0.212	1.000		
(15) Maturity	0.060	0.018	0.178	0.029	-0.051	0.069	-0.012	0.006	-0.087	0.043	-0.084	-0.036	0.201	0.094	1.000	
(16) Secured	0.015	-0.044	0.138	-0.476	-0.082	-0.115	0.195	-0.058	0.069	-0.024	-0.023	-0.440	-0.375	0.354	0.183	1.000

Notes: This table presents the correlation matrix of the study independent variables. The study sample includes 861 U.S. borrowing companies observed 2002-2018. *High_OBSLease* is a dummy variable that takes the value of one if a borrowing firm belongs to an industry in the highest quartile (top 25%) of the distribution of the present value of the observed firm's off-balance sheet leasing commitments. Following S&P's methodology, which is widely used in the literature (Demerjian, 2011; Cornaggia et al., 2013; Altamuro et al., 2014; Paik et al., 2015; Lim et al., 2017), we measure firms off-balance sheet leasing as the present value of future minimum lease payments due in five years plus an estimation of the present value of the aggregate minimum lease payments due beyond five years (Thereafter component). In accordance with prior studies, we use a discount rate of 10%. In line with Demerjian (2011), we control for the volatility ratio of the balance sheet (*VR*). It is defined as the ratio between the book value volatility and the adjusted net income volatility and accounts for the ability of the balance sheet to provide accurate information about the borrower's financial health. We also control for additional firm-specific variables (*Leverage, Size, MTB, ROA, Loss, Advert_expense, RD_expense, Tangibility, Zscore,* and *Div_dummy*), as well as loan-specific variables (*Loan_Size, Dividend_restriction, Maturity, and Secured*). Please refer to Appendix B for a detailed definition of the variables used in this study.

Table 4.3 presents the average distribution of firms' off-balance sheet leasing commitments by Industry.[34] *OBSLease* represents the industry average of the present value of a firms' future off-balance sheet leasing commitments divided by total assets calculated following S&P's methodology. Table 4.3 also reports the industry average frequency of closeness to the financial covenant threshold expressed in percentage terms (BSCOV*close* and ISCOV*close*). In accordance with prior studies, we define a borrowing firm as close to violating one of its financial covenants if a firm's reported financial ratio is within 15% of the limit imposed in the loan contract (Franz et al., 2014; Fan et al., 2019). Following Demerjian (2011), we classify firms' financial covenants specified in the loan contract into balance-sheet based covenants (*BSCOV*) and income-statement based covenants (*ISCOV*). In Table 4.2, BSCOV*close* signals that the borrowing company is close to violating at least one of the balance-sheet based covenant thresholds specified in the loan contract. Accordingly, ISCOV*close* is a dummy variable that takes a value of one if the borrowing company is approaching the violation of at least one of the income-statement based covenants indicated in the loan contract.

[34] In accordance with Dechow et al. (2011), our industry classification is created from the following SIC codes ranges: Agriculture: 0100–0999; Mining and Construction: 1000–1299, 1400–1999; Food and Tobacco: 2000–2141; Textiles and Apparel: 2200–2399; Lumber, Furniture, and Printing: 2400–2796; Chemicals: 2800–2824, 2840–2899; Refining and Extractive: 1300–1399, 2900–2999; Durable Manufacturers: 3000–3569, 3580–3669, 3680–3999; Computers: 3570–3579, 3670–3679, 7370–7379; Transportation: 4000–4899; Retail: 5000–5999; Services: 7000–7369, 7380–9999; and Pharmaceuticals: 2830–2836, 3829–3851.

Table 4-3 Average off-balance sheet lease financing and closeness to financial covenants violation by industry

Industry classification	**OBS*Lease (in %)***	**BSCOV*close* *(in %)***	**ISCOV*close* *(in %)***	**N**
Retail	31.72	10.48	47.38	1355
Services	15.66	14.48	46.36	1195
Textiles and Apparel	14.69	1.92	51.92	156
Agriculture	10.45	4.76%	57.14	42
Transportation	10.60	9.85	42.30	792
Computers	9.15	15.63	31.95	870
Lumber, Furniture, Printing	6.73	16.50	30.99	497
Food and Tobacco	5.89	6.53	35.43	398
Pharmaceuticals	5.60	7.74	32.95	607
Chemicals	5.10	7.35	24.26	272
Durable Manufacturers	5.14	6.68	31.51	2155
Mining and Construction	4.91	21.54	36.98	311
Refining and Extractive	3.26	22.04	34.30	481
Overall Sample	11.55	11.24	37.61	9131

Notes: This table reports the average percentage of borrowing firms' off-balance sheet lease financing by industry. The sample study covers 9,131 firm-year observations that consist of 861 U.S. borrowing companies observed from 200-2018. Following S&P's methodology, which is widely used in the literature (Demerjian, 2011; Cornaggia et al., 2013; Altamuro et al., 2014; Paik et al., 2015; Lim et al., 2017), we define the variable *OBSLease* that measures firms off-balance sheet leasing as the present value of future minimum lease payments due in five years plus an estimation of the present value of the aggregate minimum lease payments due beyond five years (Thereafter component). In accordance with prior studies, we use a discount rate of 10%. Furthermore, we follow Demerjian (2011) and classify financial covenants into income statement and balance-sheet based ratios. To account for financial covenant proximity, we follow Franz et al. (2014) and Fan et al. (2019) and identify a borrowing company as approaching financial covenant violation if its reported financial ratio is within 15% of the threshold stated in the loan contract. Accordingly, the variable *ISCOVclose* is a dummy variable that takes a value of one if the borrowing company is close to breach an income -statement based financial covenant threshold stated in the loan contract and is zero otherwise. Similarly, the variable *BSCOVclose* is an indicator variable that takes a value of one if the borrowing firm is close to violating a balance-sheet based covenant and is zero otherwise. Finally, in accordance with Dechow et al. (2011), our industry classification is created from the following SIC codes ranges: Agriculture: 0100–0999; Mining and Construction: 1000–1299, 1400–1999; Food and Tobacco: 2000–2141; Textiles and Apparel: 2200–2399; Lumber, Furniture, and Printing: 2400–2796; Chemicals: 2800–2824, 2840–2899; Refining and Extractive: 1300–1399, 2900–2999; Durable Manufacturers: 3000–3569, 3580–3669, 3680–3999; Computers: 3570–3579, 3670–3679, 7370–7379; Transportation: 4000–4899; Retail: 5000–5999; Services: 7000–7369, 7380–9999; and Pharmaceuticals: 2830–2836, 3829–3851.

In line with prior studies, Table 4.3 indicates that the Retail industry sector regroups firms with the most significant use of off-balance sheet lease financing with around 31.72% of their total assets represented by off-balance sheet lease financing (Goodacre, 2010; Rauh and Sufi, 2012; Paik et al., 2015; Giner et al., 2019). Also included in the top of the industry off-balance sheet leasing distribution of our sample are firms from the Services and Textiles industries with 15.66% and 14.69% of their total assets financed by off-balance sheet leasing, respectively. Furthermore, Table 4.3 reports that those industries include firms that exhibit, on average, a greater proximity to income-statement based covenant thresholds (47.38% for the retail sector and 46.36% and 51.92% for services and textile industries, respectively).

Table 4.4 reports the summary statistics of our overall sample of 861 U.S. borrowing companies from 2002-2018. Table 4.4 indicates that for the overall sample, firms' off-balance sheet lease financing represents 11.5% of their total assets; 37.6% of these firms are close to violating at least one of the income-statement based covenants specified in the debt contract, while only 11.2% are approaching the balance-sheet based covenant ratios.

Table 4-4 Summary statistics

	All Sample				**High OBSLease**				**Low OBSLease**			
	Mean	Median	St.Dev	N	Mean	Median	St.Dev	N	Mean	Median	St.Dev	N
OBSLease	0.115	0.049	0.199	9131	0.236	0.114	0.301	2705	0.065	0.038	0.097	6426
ISCOV*close*	0.376	0.000	0.484	9131	0.472	0.000	0.499	2705	0.336	0.000	0.472	6426
BSCOV*close*	0.112	0.000	0.316	9131	0.118	0.000	0.322	2705	0.110	0.000	0.313	6426
VR	2.413	1.378	4.100	9131	2.548	1.408	3.869	2705	2.356	1.360	4.193	6426
Leverage	0.184	0.148	0.169	8704	0.194	0.159	0.172	2549	0.180	0.144	0.168	6155
Size	6.542	6.746	2.219	8692	6.474	6.705	2.305	2546	6.570	6.761	2.182	6146
MTB	1.718	1.448	0.955	8686	1.714	1.434	0.969	2549	1.720	1.452	0.949	6137
ROA	0.034	0.120	5.819	9131	-0.150	0.126	10.688	2705	0.111	0.117	0.138	6426
Loss	0.271	0.000	0.445	9131	0.256	0.000	0.436	2705	0.277	0.000	0.448	6426
Advert_expense	0.011	0.000	0.028	9102	0.015	0.002	0.030	2687	0.009	0.000	0.027	6415
RD_expense	0.024	0.000	0.111	9102	0.004	0.000	0.048	2687	0.032	0.004	0.128	6415
Tangibility	0.284	0.217	0.225	9123	0.298	0.263	0.226	2705	0.278	0.204	0.224	6418
Zscore	2.444	2.134	2.203	9127	2.612	2.381	1.877	2704	2.373	2.045	2.323	6423
Div_dummy	0.411	0.000	0.492	9131	0.363	0.000	0.481	2705	0.432	0.000	0.495	6426
Loan_Size	18.322	18.644	1.895	9086	18.379	18.644	1.823	2689	18.298	18.644	1.924	6397
Dividend_restriction	0.781	1.000	0.413	8700	0.779	1.000	0.415	2534	0.783	1.000	0.413	6166
Maturity	3.653	3.932	0.685	8983	3.692	3.951	0.660	2627	3.638	3.912	0.694	6356
Secured	0.723	1.000	0.448	8786	0.730	1.000	0.444	2561	0.720	1.000	0.449	6225

Notes: This table reports the summary statistics for our sample of 861 U.S. borrowing companies from 2002-2018. *High OBSLease* regroups firms belonging to industries in the highest quartile of the distribution of the ratio of present value of OBS leases divided by total assets. All the lowest quartiles (bottom 75%) regroup firms belonging to the Low OBS lease industries Following S&P's methodology, which is widely used in the literature (Demerjian, 2011; Cornaggia et al., 2013; Altamuro et al., 2014; Paik et al., 2015; Lim et al., 2017), we define the variable *OBSLease,* which measures firms' off-balance sheet leasing as the present value of future minimum lease payments due in five years plus an estimation of the present value of the aggregate minimum lease payments due beyond five years (Thereafter component). In accordance with prior studies, we use a discount rate of 10%. Moreover, and following Demerjian (2011), we classify firms' financial covenants into income-statement based covenants and balance-sheet based covenants. To account for financial covenant proximity, we follow Franz et al. (2014) and Fan et al. (2019) and identify a borrowing company as approaching financial covenant violation if its reported financial ratio is within 15% of the threshold stated in the loan contract. Thus, the variable *ISCOVclose* is a dummy variable that takes a value of one if the borrowing company is close to breaching an income-statement based financial covenant threshold stated in the loan contract and is zero otherwise. Similarly, the variable *BSCOVclose* is an indicator variable that takes a value of one if the borrowing firm is close to violating a balance-sheet based covenant and is zero otherwise. In accordance with Demerjian (2011), we define the volatility ratio of the balance sheet *VR*. The variable *VR* measures the balance sheet's ability to provide accurate information regarding the borrower's financial health and is defined as the ratio between the book value volatility and the adjusted net income volatility. We also control for additional firm-specific variables (*Leverage, Size, MTB, ROA, Loss, Advert_expense, RD_expense, Tangibility, Zscore,* and *Div_dummy*), as well as loan-specific variables (*Loan_Size, Dividend_restriction, Maturity,* and *Secured*). All variables are defined in Appendix B.

Furthermore, in Table 4.4, we subdivide our sample into firms belonging to industries with the highest use of off-balance sheet lease financing (*High OBS Lease*) and we classify the remaining firms as entities with the lowest use of off-balance sheet financing (*Low OBS Lease*). In line with Paik et al. (2015), *High OBS Lease* industries regroup firms with the highest 25% of the distribution of a firm's present value of future off-balance sheet leasing commitments divided by its total assets. *Low OBS Lease* industries regroup the remaining firms situated in the lowest 75% of the distribution of a firm's present value of future off-balance sheet leasing commitments divided by its total assets.[35]

In terms of the average closeness to balance-sheet based covenant violations, Table 4.3 shows no significant difference between firms in the *High* and *Low* off-balance sheet leasing industries. However, the difference in means between the *High* and *Low* off-balance sheet leasing industries in terms of closeness to income-statement based covenant violations is 13.9% (47.3 - 33.4). This indicates that, on average, the likelihood of breaching a financial covenant threshold is 13.9% higher for firms with the most significant use of off-balance sheet financing. This is in line with standard setters' estimation that for heavy users of off-balance sheet leasing, such as firms in the retail industry, the application of the new leasing standard IFRS 16 *leases* would increase firms' long-term financial liabilities to equity ratio by a substantial 55%, leading to concerns over potential loan terms breach (IASB, 2016).

Table 4.4 also reports the summary statistics of additional variables that prior research has identified as significant in explaining the type of debt covenants used in the loan contract. In accordance with Demerjian (2011), we define the variable *VR* (balance sheet volatility ratio) to account for the extent to which the information provided by the borrowing company is reliable and free from manipulation. In accordance with Paik et al. (2015), Table 4.4 indicates no significant statistical differences between the average balance sheet volatility in the *High* and *Low* off-balance sheet leasing industries.

Table 4.4 further reports the summary statistics of additional firm and loan specific variables that have been identified by the prior literature as relevant in explaining the use

[35] Please note that a matrix analysis could be used to determine the optimal number of cut-off points. This methodology is beyond the thesis scope but could be used as a future potential extension of Chapter 4.

of debt covenants in loan contracts (Demerjian, 2011; Paik et al., 2015). Table 4.4 indicates that only *ROA* (return on assets) and *RD_expense* (research and development expenditures) show a significant difference in means between firms belonging and *High* and *Low* off-balance sheet leasing industries. Borrowing firms belonging to *High OBS* leasing industries report an average negative performance of 15%, while borrowing companies in *Low OBS* leasing industries exhibit a mean accounting performance of 11.1%. Research and Development expenditures are around 3% higher in firms belonging to low off-balance sheet leasing industries. As these firms have, on average, lower proximity to both income statement and balance-sheet based covenant thresholds, we speculate that closeness to covenant violations triggers tighter restriction on firms' expenditures. This accounts for the lower R&D expense ratios in firms with low off-balance sheet leasing exposure.

In accordance with Paik et al. (2015), our summary statistics indicate that borrowing companies in *High* and *Low OBS* leasing industries are equivalent in terms of size and the likelihood of reporting a loss. In line with Paik et al. (2015), Table 4.4 reports few statistical differences between the two groups in terms of loan specific variables. Finally, we do not find significant differences between High and Low off-balance sheet leasing industries for other firm specific variables, such as asset tangibility and dividend pay-outs.

4.5.2 Findings and Discussion

Table 4.5 reports the findings of the logistic regression of our main research question that investigates whether firms with significant use of off-balance sheet lease financing are more likely to be close to debt covenant violations. We focus on financial covenants that we classify into balance-sheet based covenants and income-statement based covenants (Demerjian, 2011).

In Table 4.5, Columns (1)-(3) correspond to the specification in Equation (2) where the dependent variable (*BSclose*) is a dummy variable that takes a value of one if the borrowing company is close to violating at least one of its balance-sheet based covenants and is zero otherwise. Columns (4)-(5) indicate the regression results of Equation (3) where the dependent variable (*ISclose*) is an indicator variable that takes a value of one if the borrowing company is close to breaching at least one of the income-statement based covenants specified in the loan contract.

Table 4.5 indicates no significant relationship between the variable *High_OBSLease* and a firm's proximity to violating a balance-sheet based covenant threshold *(BSclose).* If the financial covenant threshold is based on information extracted from a borrowing firm's balance sheet, our model inferences show no significant relationship between the likelihood of approaching this specific type of financial covenant and a firm's use of off-balance sheet lease financing. This result is consistent with a decline in the usefulness of balance sheet information for contracting purposes due to its high exposure to accounting "window dressing" practices (Holthausen and Watts, 2001; Watts, 2003; Kothari et al., 2010). In contrast, Table 4.5 reports that the coefficient on the variable *High_OBSLease* shows a significant positive impact (0.642; p-value<0.0001) on the likelihood of approaching income-statement based covenant threshold (*ISclose*).

Our findings indicate that borrowing firms with significant exposure to off-balance sheet leasing have a greater probability of being close to violating at least one of the income-statement based financial covenants stated in the loan contract. In addition, Table 4.5 indicates that these borrowing firms are smaller (-0.119; p-value<0.0001) and have a significant leverage ratio (3.765; p-value<0.0001). Furthermore, Table 4.5 reports that borrowing companies approaching income-statement based covenant violations have significantly lower market performance (*MTB*) and accounting performance (*ROA*) with around an 80% probability of reporting a loss during the previous year as captured by the coefficient on the variable *Loss* (0.802; p-value<0.0001). Accordingly, our results suggest that income statement covenant violation proximity increases significantly for firms with lower *Zscore* (-0.05; p-value<0.001) and, as such, a greater probability of financial distress.

Moreover, our results indicate that borrowing firms close to violating at least one of the income statement covenants as stated in the loan contract are significantly more restrained in terms of expenditures and dividend pay outs. Finally, Table 4.5 indicates that loan contracts where the borrowing company is close to violating at least one of the income statement-based covenants are secured and significantly larger.

In sum, our first regression analysis indicates that highly leveraged small firms with substantial financial constraints and poor performance prospects are more likely to use off-balance sheet lease financing when approaching a financial covenant violation.

However, this relationship is only significant if the financial covenant threshold is constructed based on accounting information retrieved from the borrowing company's income statement.

In Table 4.6, we explore an alternative method for analysing the effect of borrowing firms' off-balance sheet leasing exposure on the likelihood of financial covenant proximity. Correspondingly, we define the following equations where the variable *OBSLease*High_OBSLease* acts as the interaction term between a continuous measure of the borrowing firms' off-balance sheet leasing commitments (*OBSLease*) and their interaction with the likelihood that a firm belongs to an industry with a significant use of off-balance sheet leasing (*High_OBSLease*).

$$\begin{aligned}\text{BSCOV}close = {} & \beta_0 + \beta_1 OBSLease_{it} + \beta_2 OBSLease_{it} * High_{OBSLease_{it}} + \beta_3 VR_{it} \\ & + \beta_4 Leverage_{it} + \beta_5 Size_{it} + \beta_6 MTB_{it} + \beta_7 ROA_{it} + \beta_8 Loss_{it} \\ & + \beta_9 Advert_{expense_{it}} + \beta_{10} RD_{expense_{it}} + \beta_{11} Tangibility_{it} \\ & + \beta_{12} Zscore_{it} + \beta_{13} Div_{dummy_{it}} + \beta_{14} Loan_{Size_{it}} \\ & + \beta_{15} Dividend_{restriction_{it}} + \beta_{16} Maturity_{it} + \beta_{17} Secured_{it} + \varepsilon_{it}\end{aligned} \tag{4}$$

$$\begin{aligned}\text{ISCOV}close = {} & \beta_0 + \beta_1 OBSLease_{it} + \beta_2 OBSLease_{it} * High\_OBSLease_{it} + \beta_3 VR_{it} \\ & + \beta_4 Leverage_{it} + \beta_5 Size_{it} + \beta_6 MTB_{it} + \beta_7 ROA_{it} + \beta_8 Loss_{it} \\ & + \beta_9 Advert\_expense_{it} + \beta_{10} RD\_expense_{it} + \beta_{11} Tangibility_{it} \\ & + \beta_{12} Zscore_{it} + \beta_{13} Div\_dummy_{it} + \beta_{14} Loan\_Size_{it} \\ & + \beta_{15} Dividend\_restriction_{it} + \beta_{16} Maturity_{it} + \beta_{17} Secured_{it} + \varepsilon_{it}\end{aligned} \tag{5}$$

Table 4-5 Proximity to financial covenant violations and off-balance sheet leasing magnitude

	BS*close*			**IS*close***		
	(1)	(2)	(3)	(4)	(5)	(6)
High_OBSLease	0.047	0.047	0.047	0.642***	0.634***	0.641***
	(0.084)	(0.084)	(0.084)	(0.060)	(0.060)	(0.060)
VR	0.006	0.006	0.006	0.001	0.003	0.003
	(0.008)	(0.008)	(0.008)	(0.006)	(0.006)	(0.006)
Leverage	1.630***	1.650***	1.626***	3.765***	3.806***	3.957***
	(0.245)	(0.241)	(0.236)	(0.198)	(0.195)	(0.194)
Size	-0.015		-0.016	-0.119***		-0.059***
	(0.027)		(0.023)	(0.021)		(0.017)
MTB	0.156***	0.150***	0.157***	-0.049	-0.111***	-0.077*
	(0.048)	(0.046)	(0.047)	(0.042)	(0.041)	(0.042)
ROA	-1.769***	-1.787***	-1.769***	-2.093***	-2.230***	-2.063***
	(0.335)	(0.333)	(0.335)	(0.308)	(0.309)	(0.310)
Loss	0.276***	0.290***	0.275***	0.802***	0.888***	0.824***
	(0.097)	(0.094)	(0.096)	(0.070)	(0.068)	(0.070)
Advert_expense	-1.004	-1.038	-1.008	2.194**	2.144**	2.234**
	(1.508)	(1.513)	(1.507)	(0.968)	(0.958)	(0.968)
RD_expense	1.792***	1.757***	1.795***	-4.584***	-4.990***	-4.963***
	(0.527)	(0.523)	(0.524)	(0.666)	(0.669)	(0.673)
Tangibility	0.923***	0.915***	0.922***	-0.640***	-0.629***	-0.602***
	(0.165)	(0.165)	(0.165)	(0.129)	(0.128)	(0.128)
Zscore	0.013	0.015	0.013	-0.064***	-0.050***	-0.058***
	(0.017)	(0.017)	(0.017)	(0.015)	(0.014)	(0.015)
Div_dummy	0.387***	0.375***	0.386***	-0.046	-0.126**	-0.036
	(0.091)	(0.089)	(0.091)	(0.064)	(0.062)	(0.064)
Loan_Size	-0.002	-0.011		0.111***	0.038**	
	(0.030)	(0.025)		(0.022)	(0.018)	

Dividend_restriction	-0.470***	-0.460***	-0.470***	0.302***	0.363***	0.309***
	(0.090)	(0.089)	(0.090)	(0.073)	(0.072)	(0.072)
Maturity	-0.016	-0.014	-0.016	0.016	0.023	0.064
	(0.057)	(0.057)	(0.056)	(0.043)	(0.043)	(0.042)
Secured	0.026	0.027	0.027	0.420***	0.484***	0.365***
	(0.102)	(0.100)	(0.100)	(0.074)	(0.073)	(0.073)
_cons	-2.623***	-2.559***	-2.647***	-2.839***	-2.316***	-1.364***
	(0.498)	(0.486)	(0.282)	(0.364)	(0.351)	(0.208)
N	7947	7956	7947	7947	7956	7947
N if BS*close*==1	1026	1026	1026			
N if IS*close==1*				3434	3434	3434
Chi^2	253.49	253.44	253.49	1941.17	1910.71	1916.34
Pseudo R^2	0.0461	0.0461	0.0461	0.1862	0.1830	0.1838

Notes. This table reports the results of our logistic regression that investigates the relationship between borrowing firms' proximity to violating financial covenant thresholds and the magnitude of firms' off-balance sheet leasing. The sample study covers 7,947 firm-year observations from 2002-2018. To account for financial covenant proximity, we follow Franz et al. (2014) and Fan et al. (2019) and identify a borrowing company as approaching financial covenant violation if its reported financial ratio is within 15% of the threshold stated in the loan contract. In addition, we follow Demerjian (2011) and classify firms' financial covenants into income statement and balance-sheet based covenants. Accordingly, in Columns (1)-(3), the model dependent variable (*BSCOVclose)* is a dummy variable that takes a value of one if the observed borrowing company is close to violating at least one of its balance-sheet based financial covenant thresholds and is zero otherwise takes the. In Columns (4)-(6), the model dependent variable (*ISCOVclose*) is a dummy variable that takes a value of one if the observed firm is close to breaching at least one of the income-statement based financial ratio covenants stated in the loan contract and is zero otherwise. Our variable of interest is *High_OBSLease*. It is defined as a dummy variable that takes a value of one for firms belonging to industries in the highest quartile (top 25%) of the distribution of the ratio of the present value of off-balance sheet lease commitments divided by total assets and is zero otherwise. To calculate firms' off-balance sheet leasing commitments, we follow S&P's methodology that is widely used in the literature (Demerjian, 2011; Cornaggia et al., 2013; Altamuro et al., 2014; Paik et al., 2015; Lim et al., 2017), and define firms' off-balance sheet leasing magnitude as the present value of future minimum lease payments due in five years plus an estimation of the present value of the aggregate minimum lease payments due beyond five years (Thereafter component). In accordance with prior studies, we use a discount rate of 10%. Furthermore, in accordance with Demerjian (2011), we define the volatility ratio of the balance sheet (*VR)*. The variable *VR* measures the balance sheet's ability to provide accurate information regarding the borrower's financial health and is defined as the ratio between the book value volatility and the adjusted net income volatility. We also control for additional firm-specific variables (*Leverage, Size, MTB, ROA, Loss, Advert_expense, RD_expense, Tangibility, Zscore, and Div_dummy*), as well as loan-specific variables (*Loan_Size, Dividend_restriction, Maturity, and Secured*). Among the total sample of 7,947 firm-year observations, 1,026 correspond to firm-year observations where the borrowing company was close to violating at least one of its balance-sheet based covenants (*BSclose==1)* and 3,434 correspond to firm-year observations were the borrowing firm was close to breaching at least one of the income-statement based covenants specified in the loan contract (*ISclose==1).* Standard errors are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level of risk. All variables are defined in Appendix B.

Columns (1)-(3) from Table 4.6 report the OLS logistic regression results for Equation (4) where our dependent variable measures the likelihood that a firm is approaching a balance-sheet based financial covenant (*BS_close*). Similarly, Columns (4)-6) provide the OLS logistic regression of Equation (5) where the dependent variable accounts for the likelihood of approaching an income-statement based covenant (*IS_close*).

This alternative model specification seeks to identify, as reported in Table 4.5, borrowing firms with significant use of off-balance sheet lease financing that are more sensitive to the proximity of a financial covenant breach compared to borrowing firms with little use of off-balance sheet lease financing. In accordance with our expectations, we find that while the interaction component is not significant in explaining the proximity to balance-sheet based covenants, it is highly positively significant (2.129; p-value<0.0001) in explaining the closeness to income statement covenant violations. Table 4.6 results indicate that for loan contracts containing at least one income-statement based covenant ratio, borrowing firms with significant use of off-balance sheet lease financing are significantly more likely to be approaching the threshold stated in the loan contract when compared to firms with low use of off-balance sheet leasing.

Table 4-6 Analysis of the effect of borrowing firms' off-balance sheet leasing on financial covenant proximity by including the interaction term

	BSCOVclose			**ISCOVclose**		
	(1)	(2)	(3)	(4)	(5)	(6)
OBSLease	-1.208**	-1.166**	-1.208**	0.409	0.618*	0.435
	(0.535)	(0.534)	(0.535)	(0.346)	(0.342)	(0.348)
OBSLease High_OBSLease*	0.313	0.283	0.314	2.129***	1.956***	2.120***
	(0.545)	(0.544)	(0.544)	(0.347)	(0.344)	(0.349)
VR	0.007	0.008	0.007	-0.001	-0.000	0.000
	(0.008)	(0.008)	(0.008)	(0.007)	(0.006)	(0.006)
Leverage	1.543***	1.578***	1.548***	4.193***	4.233***	4.370***
	(0.247)	(0.243)	(0.237)	(0.203)	(0.201)	(0.200)
Size	-0.026		-0.025	-0.106***		-0.052***
	(0.027)		(0.023)	(0.021)		(0.017)
MTB	0.161***	0.150***	0.160***	-0.043	-0.100**	-0.069
	(0.047)	(0.046)	(0.047)	(0.043)	(0.042)	(0.043)
ROA	-1.702***	-1.729***	-1.702***	-2.642***	-2.774***	-2.618***
	(0.323)	(0.323)	(0.323)	(0.317)	(0.317)	(0.319)
Loss	0.296***	0.318***	0.296***	0.753***	0.827***	0.771***
	(0.096)	(0.094)	(0.096)	(0.071)	(0.069)	(0.071)
Advert_expense	-0.267	-0.300	-0.264	0.773	0.715	0.785
	(1.436)	(1.443)	(1.435)	(0.955)	(0.949)	(0.955)
RD_expense	1.684***	1.631***	1.681***	-4.969***	-5.332***	-5.294***
	(0.520)	(0.516)	(0.517)	(0.666)	(0.666)	(0.670)
Tangibility	0.983***	0.973***	0.983***	-0.936***	-0.931***	-0.900***
	(0.165)	(0.165)	(0.165)	(0.133)	(0.132)	(0.132)
Zscore	0.026	0.028*	0.026	-0.085***	-0.074***	-0.079***
	(0.017)	(0.017)	(0.017)	(0.016)	(0.016)	(0.016)
Div_dummy	0.356***	0.339***	0.357***	-0.010	-0.079	0.000
	(0.091)	(0.089)	(0.091)	(0.065)	(0.063)	(0.064)
Loan_Size	0.002	-0.013		0.101***	0.036**	
	(0.030)	(0.025)		(0.023)	(0.018)	
Dividend_restriction	-0.453***	-0.439***	-0.453***	0.244***	0.296***	0.249***

	(0.090)	(0.089)	(0.090)	(0.073)	(0.072)	(0.073)
Maturity	-0.016	-0.013	-0.015	0.021	0.028	0.066
	(0.057)	(0.057)	(0.056)	(0.044)	(0.043)	(0.042)
Secured	0.038	0.044	0.037	0.377***	0.431***	0.327***
	(0.102)	(0.101)	(0.100)	(0.075)	(0.074)	(0.074)
_cons	-2.572***	-2.472***	-2.544***	-2.560***	-2.110***	-1.221***
	(0.500)	(0.489)	(0.285)	(0.368)	(0.355)	(0.211)
N	7947	7956	7947	7947	7956	7947
Chi^2	269.09	268.55	269.09	2105.90	2084.61	2085.86
Pseudo R^2	0.0490	0.0488	0.0490	0.2020	0.1997	0.2001

Notes. This table reports the results of our logistic regression that explores an alternative method to analyse the effect of borrowing firms' off-balance sheet leasing on financial covenant proximity. We posit that borrowing firms belonging to industries with significant use of off-balance sheet leasing (*High_OBSLease*) are more sensitive to the proximity of financial covenant violations. To test this hypothesis, we define a continuous measure of firms' off-balance sheet leasing (*OBSLease*) and its interaction with the dummy variable *High_OBSLease* (*OBSLease* High_OBSLease*). The sample study covers 7,947 firm-year observations 2002-2018. To account for financial covenant proximity, we follow Franz et al. (2014) and Fan et al. (2019) and identify a borrowing company as approaching financial covenant violation if its reported financial ratio is within 15% of the threshold stated in the loan contract. In addition, we follow Demerjian (2011) and classify firms' financial covenants into income statement and balance-sheet based covenants. Accordingly, in Columns (1)-(3), the model dependent variable (*BSCOVclose)* is a dummy variable that takes a value of one if the observed borrowing company is close to violating at least one of its balance-sheet based financial covenant thresholds and is zero otherwise. In Columns (4)-(6), the model dependent variable (*ISCOVclose*) is a dummy variable that takes a value of one if the observed firm is close to breaching at least one of the income-statement based financial ratio covenants stated in the loan contract and is zero otherwise. Our variables of interest are *OBSLease* and its interaction with the dummy variable *High_OBSLease* (*OBSLease* High_OBSLease*). To calculate firms' off-balance sheet leasing commitments (*OBSLease*), we follow S&P's methodology, which is widely used in the literature (Demerjian, 2011; Cornaggia et al., 2013; Altamuro et al., 2014; Paik et al., 2015; Lim et al., 2017), and define firms' off-balance sheet leasing magnitude as the present value of future minimum lease payments due in five years plus an estimation of the present value of the aggregate minimum lease payments due beyond five years (Thereafter component). In accordance with prior studies, we use a discount rate of 10%. *High_OBSLease* is defined as a dummy variable that takes a value of one for firms belonging to industries in the highest quartile (top 25%) of the distribution of the ratio of the present value of off-balance sheet lease commitments divided by total assets and is zero otherwise. Furthermore, in accordance with Demerjian (2011), we define the volatility ratio of the balance sheet (*VR)*. The variable *VR* measures the balance sheet's ability to provide accurate information on the borrower's financial health and is defined as the ratio between the book value volatility and the adjusted net income volatility. We also control for additional firm-specific variables (*Leverage, Size, MTB, ROA, Loss, Advert_expense, RD_expense, Tangibility, Zscore, and Div_dummy*), as well as loan-specific variables (*Loan_Size, Dividend_restriction, Maturity,* and *Secured*). Among the total sample of 7,947 firm-year observations, 1,026 correspond to firm-year observations where the borrowing company was close to violating at least one of its balance-sheet based covenants (*BSclose==1),* and 3,434 corresponds to firm-year observations where the borrowing firm was close to breaching at least one of the income-statement based covenant specified in the loan contract (*ISclose==1).* Standard errors are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level of risk. All variables are defined in Appendix B.

Our findings build on prior studies on the relationship between accounting information in debt covenants and borrowing firms' exposure to off-balance sheet lease financing. While Demerjian (2011) reports a negative and significant relationship between firms use of both income statement and balance-sheet based covenants and their exposure to off-balance sheet leasing use, Paik et al. (2015) find that in the particular case of firms belonging to industries with significant use of off-balance sheet leasing, lenders are more likely to include income-statement based covenants in the loan contract and avoid the use of balance-sheet based covenants. Demerjian's (2011) argument is based on the assumption that from a lender's perspective, the usefulness and reliability of the accounting information provided by the borrowing company's financial statement is adversely affected by its use of off-balance sheet leasing. In contrast, Paik et al. (2015) argue that due to their timely and forward-looking characteristics, income-statement based metrics remain reliable for contractual use, especially for firms with significant use of off-balance sheet leasing.

In line with Paik et al. (2015), our findings indicate that the existence of income-statement based covenants is significantly higher in firms with significant exposure to off-balance sheet leasing. However, we extend Paik et al. (2015) by implementing a measure of debt covenant use based on the proximity to financial covenant violation instead of the frequency of covenant use. Taking into account the proximity to financial covenant violation allows us to analyse how borrowing company behaviour may change after the loan inception date, a behaviour that is potentially driven by accounting "window dressing" incentives. We find that borrowing companies close to violating at least one of the income statement-based covenants as specified in the debt contract are more likely to be exposed to significant use of off-balance sheet leasing. Consistent with Eisfeldt and Rampini (2009), our results also indicate that these borrowing companies with significant use of off-balance sheet leasing are likely to be small and low performing companies, as well as companies already facing a significant leverage ratio. Therefore, our study supports the view that once the loan contract is initiated, managers of borrowing companies facing tight financial conditions have greater incentives to use off-balance sheet leasing for window dressing purposes and potentially avoiding a financial covenant violation. This is in line with Caskey and Ozel (2019) who argue that off-balance sheet leasing should be used in a significant proportion in order to produce a meaningful

reporting benefit. We also extend studies on the relationship between proximity to debt covenant violations and earnings management practices (Defond and Jiambalvo, 1994; Dichev and Skinner, 2002; Franz et al., 2014; Fan et al., 2019; Malikov et al., 2019). We argue that as an additional type of accounting "window dressing", borrowing firms are more likely to use off-balance sheet lease financing when approaching a debt covenant violation. Finally, our results are also in line with Beatty et al. (2010) who find that the likelihood of using off-balance sheet leasing increases when managers have greater incentives to manipulate their accounting statements though earnings management practices.

4.6 Additional analysis

4.6.1 Off-balance sheet leasing and actual debt covenant violations

In the previous section, we reported evidence that when borrowing firms are close to violating at least one of their income-statement based financial covenants, their managers have greater incentives to use off-balance sheet lease financing, potentially to manipulate the reported accounting information and avoid covenant violation. If our previous inferences are true, this relationship should no longer be significant after the event of actual covenant violation meaning that the covenant breach was actually avoided. To account for an actual debt covenant violation, we use the dataset provided by Professor Amir Sufi's website.[36] This dataset is used in Nini et al. (2012) and covers a large sample of observations of all debt covenant violations of U.S. firms observed quarterly from 1996-2007.[37] Thus, we define the following specification where the dependent variable (*violation*) is a dummy variable that takes a value of one if the borrowing company *i* reports an actual debt covenant violation as identified by the Nini et al. (2012) dataset and is zero otherwise. The remaining variables are defined as in Equation (2).

[36] https://faculty.chicagobooth.edu/amir.sufi/chronology.html

[37] To construct this dataset, Nini et al. (2012) use a text-search algorithm that identifies debt covenant violation events. Their algorithm searches all U.S. firms' SEC fillings published from 1996-2007 and locates a set of key words that signals covenant violations ("covenant" surrounded by either "waiv," "viol," "in default," "modif," and "not in compliance").

$$violation = \beta_0 + \beta_1 High\_OBSLease_{it} + \beta_2 VR_{it} + \beta_3 Leverage_{it} + \beta_4 Size_{it} + \beta_5 MTB_{it} + \beta_6 ROA_{it} + \beta_7 Loss_{it} + \beta_8 Advert\_expense_{it} + \beta_9 RD\_expense_{it} + \beta_{10} Tangibility_{it} + \beta_{11} Zscore_{it} + \beta_{12} Div\_dummy_{it} + \beta_{13} Loan\_Size_{it} + \beta_{14} Dividend\_restriction_{it} + \beta_{15} Maturity_{it} + \beta_{16} Secured_{it} + \varepsilon_{it} \quad (6)$$

Table 4.7 reports the OLS regression results of Equation (6). In line with our expectations, we find no significant relationship between borrowing companies' exposure to off-balance sheet leasing and the actual event of a covenant violation.

Overall, our findings suggest that small companies facing tight financial constraints and companies with a poor performance outlook use off-balance sheet lease financing to access additional funds without altering their reported financial metrics thereby avoiding a costly debt covenant violation.

Table 4-7 Actual violations of debt covenants and borrowing firms' off-balance sheet leasing activity

Dependent variable: *Violation*	**(1)**	**(2)**	**(3)**
High_OBS*Lease*	0.155	0.172	0.151
	(0.141)	(0.141)	(0.141)
VR	0.018**	0.019**	0.017*
	(0.009)	(0.009)	(0.009)
Leverage	-0.294	-0.096	-0.533
	(0.375)	(0.384)	(0.362)
Size	-0.197***		-0.257***
	(0.044)		(0.037)
MTB	-0.152	-0.280***	-0.110
	(0.097)	(0.097)	(0.095)
ROA	-1.778***	-2.061***	-1.798***
	(0.575)	(0.574)	(0.573)
Loss	1.146***	1.249***	1.118***
	(0.153)	(0.151)	(0.153)
Advert_expense	0.391	0.110	0.353
	(1.817)	(1.895)	(1.823)
RD_expense	-4.151***	-4.815***	-3.751***
	(1.294)	(1.309)	(1.254)
Tangibility	0.151	0.213	0.069
	(0.311)	(0.309)	(0.310)
Zscore	-0.050*	-0.027	-0.056*
	(0.029)	(0.028)	(0.029)
Div_dummy	-0.602***	-0.756***	-0.628***
	(0.208)	(0.204)	(0.207)
Loan_Size	-0.127***	-0.247***	
	(0.049)	(0.041)	
Dividend_restriction	0.001	0.073	-0.034
	(0.229)	(0.227)	(0.228)
Maturity	-0.037	-0.055	-0.068
	(0.096)	(0.095)	(0.095)
Secured	-0.205	-0.058	-0.130
	(0.221)	(0.217)	(0.219)
_cons	1.450*	2.474***	-0.355
	(0.845)	(0.814)	(0.488)
N	3546	3546	3546
Chi^2	345.48	326.45	338.69
Pseudo R^2	0.1681	0.1588	0.1648

Notes: This table reports the results of our logistic regression that investigates the relationship between borrowing firms' actual violation of debt covenant thresholds and the magnitude of firms' off-balance sheet leasing. After matching borrowing companies' identifiers with actual debt covenant violations identified and shared by Nini et al. (2012), our sample study is reduced to 3,546 firm-year observations from 2002-2008. Please note that the sample period stops at 2008 as the dataset on actual debt covenant violations identified and shared by Nini et al. (2012) covers only up to the year 2008 This accounts for the reduction in our sample size. The dependent variable, *violation*, takes a value of one if a borrowing firm reported an actual debt covenant violation in the Nini et al. (2012) dataset and is zero otherwise. We matched 300 firm-year observations where the borrowing company reported an actual debt covenant violation as in the Nini et al. (2012) dataset (*violation*==1). Our variable of interest is *High_OBSLease* and is defined as a dummy variable that takes a value of one for firms belonging to industries in the highest quartile (top 25%) of the distribution of the ratio of the present value of off-balance sheet lease commitments divided by total assets and is zero otherwise. To calculate firms' off-balance sheet leasing commitments, we follow S&P's methodology, which is widely used in the literature (Demerjian, 2011; Cornaggia et al., 2013; Altamuro et al., 2014; Paik et al., 2015; Lim et al., 2017), and define firms' off-balance sheet leasing magnitude as the present value of future minimum lease payments due in five years plus an estimation of the present value of the aggregate minimum lease payments due beyond five years (Thereafter component). In accordance with prior studies, we use a discount rate of 10%. Moreover, and in line with Demerjian (2011), we control for the volatility ratio of the balance sheet (*VR*). The variable *VR* measures the balance sheet's ability to provide accurate information on the borrower's financial health and is defined as the ratio between the book value volatility and the adjusted net income volatility. We also control for additional firm-specific variables (*Leverage, Size, MTB, ROA, Loss, Advert_expense, RD_expense, Tangibility, Zscore,* and *Div_dummy*), as well as loan-specific variables (*Loan_Size, Dividend_restriction, Maturity,* and *Secured*). Standard errors are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level of risk. All variables are defined in Appendix B.

4.7 Robustness tests

4.7.1 Inclusion of off-balance sheet leasing as a continuous variable

In order to test the robustness of our main results, we first repeat our regression analysis by incorporating firms' off-balance sheet leasing as a continuous variable instead of a dummy variable as in our previous specification.

Accordingly, in Table 4.8, we measure borrowing firms' exposure to off-balance sheet leasing by the variable *OBSLease* that accounts for the present value of a firm's off-balance sheet leasing commitments following the S&P calculation method. The dependent variables, as well as the control variables, are the same as in previous equations.

Table 4.8 indicates that our predictions remain consistent if we account for firms' off-balance sheet leasing as a continuous variable. In particular we find that the likelihood of approaching balance-sheet based covenants (*BS_close*) decreases with a firm's off-balance sheet leasing magnitude. In addition, the likelihood of approaching income-statement based covenant violations (*IS_close)* increases significantly with borrowing firms' off-balance sheet activity.

These results extend Paik et al. (2015) who report that, when borrowing firms are known to have a significant use of off-balance sheet lease financing, creditors are less likely to include balance sheet based covenants in the debt contract as a mean to monitor the borrowing company financing choices. The underlying theoretical determinant is that creditors understand that off-balance sheet leasing is a form of debt and firms with significant use of off-balance sheet leasing are more likely to underestimate their true level of balance sheet based ratios such as debt to equity ratios.

Table 4-8 Alternative measure of the effect of borrowing firms' off-balance sheet leasing on financial covenant proximity with the inclusion of off-balance sheet leasing as a continuous variable

	BSCOVclose			**ISCOVclose**		
	(1)	(2)	(3)	(4)	(5)	(6)
OBSLease	-0.940***	-0.924***	-0.940***	2.316***	2.362***	2.336***
	(0.258)	(0.257)	(0.258)	(0.160)	(0.160)	(0.160)
VR	0.007	0.008	0.007	-0.003	-0.002	-0.001
	(0.008)	(0.008)	(0.008)	(0.006)	(0.006)	(0.006)
Leverage	1.538***	1.573***	1.544***	4.158***	4.196***	4.338***
	(0.247)	(0.243)	(0.237)	(0.203)	(0.200)	(0.199)
Size	-0.025		-0.023	-0.095***		-0.041**
	(0.027)		(0.023)	(0.021)		(0.017)
MTB	0.159***	0.149***	0.159***	-0.043	-0.095**	-0.068
	(0.048)	(0.046)	(0.047)	(0.043)	(0.042)	(0.043)
ROA	-1.687***	-1.715***	-1.687***	-2.569***	-2.691***	-2.553***
	(0.326)	(0.326)	(0.326)	(0.310)	(0.310)	(0.312)
Loss	0.295***	0.316***	0.296***	0.740***	0.808***	0.758***
	(0.096)	(0.094)	(0.096)	(0.070)	(0.069)	(0.070)
Advert_expense	-0.228	-0.264	-0.223	1.180	1.098	1.194
	(1.432)	(1.440)	(1.431)	(0.955)	(0.948)	(0.956)
RD_expense	1.664***	1.614***	1.659***	-5.408***	-5.708***	-5.729***
	(0.519)	(0.515)	(0.516)	(0.673)	(0.672)	(0.676)
Tangibility	0.987***	0.977***	0.987***	-0.908***	-0.906***	-0.872***
	(0.165)	(0.165)	(0.165)	(0.132)	(0.132)	(0.132)
Zscore	0.024	0.027	0.025	-0.096***	-0.085***	-0.091***
	(0.017)	(0.017)	(0.017)	(0.016)	(0.016)	(0.016)
Div_dummy	0.355***	0.338***	0.356***	-0.019	-0.081	-0.009
	(0.091)	(0.090)	(0.091)	(0.064)	(0.063)	(0.064)
Loan_Size	0.002	-0.013		0.099***	0.042**	
	(0.030)	(0.025)		(0.023)	(0.018)	
Dividend_restriction	-0.454***	-0.440***	-0.454***	0.237***	0.285***	0.243***

	(0.090)	(0.089)	(0.090)	(0.073)	(0.072)	(0.073)
Maturity	-0.015	-0.012	-0.014	0.029	0.034	0.072*
	(0.057)	(0.057)	(0.056)	(0.044)	(0.043)	(0.042)
Secured	0.038	0.044	0.037	0.369***	0.420***	0.320***
	(0.102)	(0.101)	(0.100)	(0.075)	(0.074)	(0.074)
_cons	-2.595***	-2.496***	-2.561***	-2.664***	-2.251***	-1.343***
	(0.498)	(0.487)	(0.283)	(0.368)	(0.354)	(0.210)
N	7947	7956	7947	7947	7956	7947
Chi^2	268.76	268.28	268.75	2068.93	2052.87	2049.42
Pseudo R^2	0.0489	0.0488	0.0489	0.1985	0.1966	0.1966

Notes: In this table, we explore whether our results remain robust if we measure firms' off-balance sheet leasing as a continuous variable (*OBSLease*) instead of a dummy variable as previously reported. The sample study covers 7,947 firm-year observations from 2002-2018. To account for financial covenants proximity, we follow Franz et al. (2014) and Fan et al., (2019) and identify a borrowing company as approaching financial covenant violations if its reported financial ratio is within 15% of the threshold stated in the loan contract. In addition, we follow Demerjian (2011) and classify firms' financial covenants into income statement and balance-sheet based covenants. Accordingly, in Columns (1)-(3), the model dependent variable (*BSCOVclose*) is a dummy variable that takes a value of one if the observed borrowing company is close to violating at least one of its balance-sheet based financial covenant thresholds and is zero otherwise. In Columns (4)-(6), the model dependent variable (*ISCOVclose*) is a dummy variable that takes a value of one if the observed firm is close to breaching at least one of the income-statement based financial ratio covenants stated in the loan contract and is zero otherwise. To calculate firms' off-balance sheet leasing commitments (*OBSLease*), we follow S&P's methodology, which is widely used in the literature (Demerjian, 2011; Cornaggia et al., 2013; Altamuro et al., 2014; Paik et al., 2015; Lim et al., 2017), and define firms' off-balance sheet leasing magnitude as the present value of future minimum lease payments due in five years plus an estimation of the present value of the aggregate minimum lease payments due beyond five years (Thereafter component). In accordance with prior studies, we use a discount rate of 10%. Furthermore, in accordance with Demerjian (2011), we define the volatility ratio of the balance sheet (*VR*). The variable *VR* measures the balance sheet's ability to provide accurate information on the borrower's financial health and is defined as the ratio between the book value volatility and the adjusted net income volatility. We also control for additional firm-specific variables (*Leverage, Size, MTB, ROA, Loss, Advert_expense, RD_expense, Tangibility, Zscore, and Div_dummy*), as well as loan-specific variables (*Loan_Size, Dividend_restriction, Maturity,* and *Secured*). Among the total sample of 7,947 firm-year observations, 1,026 correspond to firm-year observations where the borrowing company was close to violating at least one of its balance-sheet based covenants (BSclose==1) and 3,434 correspond to firm-year observations where the borrowing firm was close to breaching at least one of the income-statement based covenant specified in the loan contract (ISclose==1). Standard errors are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level of risk. All variables are defined in Appendix B.

4.7.2 Proximity to covenant violations and firms in low leasing industries

As a second robustness test, we examine whether our results are consistent to the alternative formulation of our main hypothesis. Our main findings indicate that firms approaching financial income-statement based covenant violations are more likely to use off-balance sheet lease financing. The alternative hypothesis would be that firms far from financial covenant violations are less likely to use off-balance sheet lease financing. To test this alternative hypothesis, we redefine our variable of interest as *Low_OBSLease* (Table 4.9), a dummy variable that takes a value of one for firms belonging to industries in the lowest quartile (bottom 25%) of the distribution of the ratio of the present value of firms' off-balance sheet lease commitments divided by total assets and is zero otherwise.

Consistent with our predictions, the OLS regression results in Table 4.9 report that the coefficient on the variable *Low_OBSLease* is significantly negative (-0.354; p-value<0.0001) when firms are approaching the violation of at least one income-statement based covenant (*IS_close*). As anticipated, the signs of the coefficient *Low_OBSLease* are opposite of those on the variable *High_OBSLease* previously specified indicating that borrowing firms far from income statement covenant violations are less exposed to off-balance sheet lease financing.

Table 4-9 Proximity to financial covenant violation and firms in low off-balance sheet leasing industries

	BSCOVclose			**ISCOVclose**		
	(1)	(2)	(3)	(4)	(5)	(6)
Low_OBS*Lease*	-0.033	-0.033	-0.033	-0.354***	-0.357***	-0.339***
	(0.079)	(0.079)	(0.079)	(0.057)	(0.057)	(0.057)
VR	0.006	0.006	0.006	-0.000	0.001	0.002
	(0.008)	(0.008)	(0.008)	(0.006)	(0.006)	(0.006)
Leverage	1.622***	1.642***	1.620***	3.655***	3.692***	3.859***
	(0.247)	(0.243)	(0.237)	(0.198)	(0.195)	(0.194)
Size	-0.015		-0.016	-0.114***		-0.051***
	(0.027)		(0.023)	(0.021)		(0.017)
MTB	0.155***	0.149***	0.155***	-0.043	-0.103**	-0.072*
	(0.048)	(0.046)	(0.047)	(0.042)	(0.041)	(0.042)
ROA	-1.773***	-1.790***	-1.773***	-2.182***	-2.308***	-2.144***
	(0.335)	(0.334)	(0.335)	(0.309)	(0.310)	(0.311)
Loss	0.275***	0.290***	0.275***	0.789***	0.873***	0.813***
	(0.096)	(0.094)	(0.096)	(0.070)	(0.068)	(0.069)
Advert_expense	-1.005	-1.039	-1.007	2.234**	2.168**	2.321**
	(1.513)	(1.517)	(1.511)	(0.974)	(0.966)	(0.976)
RD_expense	1.755***	1.721***	1.757***	-6.005***	-6.401***	-6.450***
	(0.521)	(0.517)	(0.518)	(0.692)	(0.692)	(0.697)
Tangibility	0.928***	0.920***	0.928***	-0.596***	-0.586***	-0.558***
	(0.165)	(0.165)	(0.165)	(0.128)	(0.127)	(0.128)
Zscore	0.014	0.015	0.014	-0.058***	-0.045***	-0.052***
	(0.017)	(0.017)	(0.017)	(0.014)	(0.014)	(0.014)
Div_dummy	0.385***	0.373***	0.385***	-0.088	-0.164***	-0.078
	(0.091)	(0.089)	(0.091)	(0.063)	(0.062)	(0.063)
Loan_Size	-0.001	-0.010		0.116***	0.047***	
	(0.030)	(0.025)		(0.022)	(0.018)	
Dividend_restriction	-0.474***	-0.464***	-0.474***	0.254***	0.312***	0.262***
	(0.090)	(0.089)	(0.090)	(0.072)	(0.071)	(0.072)
Maturity	-0.015	-0.013	-0.016	0.021	0.027	0.072*

	(0.057)	(0.057)	(0.056)	(0.043)	(0.043)	(0.042)
Secured	0.029	0.030	0.029	0.438***	0.500***	0.380***
	(0.102)	(0.100)	(0.100)	(0.074)	(0.073)	(0.073)
_cons	-2.609***	-2.545***	-2.621***	-2.602***	-2.104***	-1.057***
	(0.499)	(0.486)	(0.286)	(0.362)	(0.349)	(0.208)
Obs.	7947	7956	7947	7947	7956	7947
Chi^2	253.34	253.30	253.34	1863.60	1836.31	1835.88
Pseudo R^2	0.0461	0.0461	0.0461	0.1788	0.1759	0.1761

Notes: In this table, we explore whether our results are robust to the alternative statement to our main hypothesis, namely, if borrowing firms in low leasing industries are less likely to be close to violating financial covenants stated in their loan contracts. This table reports the results of our logistic regression for a sample of 7,947 firm-year observations from 2002-2018. To account for financial covenant proximity, we follow Franz et al. (2014) and Fan et al. (2019) and identify a borrowing company as approaching financial covenant violation if its reported financial ratio is within 15% of the threshold stated in the loan contract. In addition, we follow Demerjian (2011) and classify firms' financial covenants into income statement and balance-sheet based covenants. Accordingly, in Columns (1)-(3), the model dependent variable (*BSCOVclose)* is a dummy variable that takes a value of one if the observed borrowing company is close to violating at least one of its balance-sheet based financial covenant thresholds and is zero otherwise. In Columns (4)-(6), the model dependent variable (*ISCOVclose*) is a dummy variable that takes a value of one if the observed firm is close to breaching at least one of the income-statement based financial ratio covenants stated in the loan contract and is zero otherwise. Our variable of interest is *Low_OBSLease*. It is defined as a dummy variable that takes a value of one for firms belonging to industries in the lowest quartile (bottom 25%) of the distribution of the ratio of the present value of off-balance sheet lease commitments divided by total assets is zero otherwise. To calculate firms' off-balance sheet leasing commitments, we follow S&P's methodology, which is widely used in the literature (Demerjian, 2011; Cornaggia et al., 2013; Altamuro et al., 2014; Paik et al., 2015; Lim et al., 2017), and define firms' off-balance sheet leasing magnitude as the present value of future minimum lease payments due in five years plus an estimation of the present value of the aggregate minimum lease payments due beyond five years (Thereafter component). In accordance with prior studies, we use a discount rate of 10%. Furthermore, in accordance with Demerjian (2011), we define the volatility ratio of the balance sheet (*VR*). The variable *VR* measures the balance sheet's ability to provide accurate information on the borrower's financial health and is defined as the ratio between the book value volatility and the adjusted net income volatility. We also control for additional firm-specific variables (*Leverage, Size, MTB, ROA, Loss, Advert_expense, RD_expense, Tangibility, Zscore, and Div_dummy*), as well as loan-specific variables (*Loan_Size, Dividend_restriction, Maturity,* and *Secured*). Among the total sample of 7,947 firm-year observations, 1,026 correspond to firm-year observations where the borrowing company was close to violating at least one of its balance-sheet based covenants (*BSclose==1)* and 3,434 correspond to firm-year observations where the borrowing firm was close to breaching at least one of the income-statement based covenants specified in the loan contract (*ISclose==1).* Standard errors are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level of risk. All variables are defined in Appendix B.

4.7.3 Sensitivity test to alternative measures of firms' off-balance sheet leasing and different discount rates

Our third robustness check examines whether our main results are sensitive to the choice of a firm's off-balance sheet leasing proxy, as well as the discount rate selected for present value calculations. In Table 4.10, we repeat our analysis using alternative measures of borrowing firms' exposure to off-balance sheet lease financing. In Columns (1)-(6) in Table 4.10, we estimate borrowing firms' off-balance sheet leasing magnitude following Moody's calculation method.[38] It considers the higher value between the S&P's estimation and the current operating lease rental expense multiplied by a factor of eight as illustrated by the following equation:

$$OBSL\_Moodys_{i,t} = \max\left(8 * Rental\ Expense_0\ ;\ Oplease\_T\_S\&P_{i,t}\right) \quad (7)$$

In addition, in Columns (7)-(12), we follow Graham et al. (1998) and estimate the value of firms' off-balance sheet leasing liabilities by capitalising a firm's future operating lease commitments as follows:

$$OBSL\_Graham_{i,t} = Rental\ Expense_0 + \sum_{t=1}^{5} \frac{MLP_t}{(1+K_d)^t} \quad (8)$$

where $Rental\ Expense_0$ reports the borrowing firm's current rental expense, MLP_t is the minimum lease payments due in the next five years, and K_d is the discount rate set at 10%.

As indicated in Table 4.10, our results remain strongly similar if we use either Moody's or Graham et al.'s (1998) proxies. This also suggests that the relationship between firms' proximity to covenant violations and off-balance sheet leasing exposure is consistent whether we take into account short- and medium-term off-balance sheet lease commitments, as in Graham et al.'s (1998) proxy, or long-term commitments as in Moody's proxy.

[38] Moody's Investors Service. 2006. Moody's Approach to Global Standard Adjustments in the Analysis of Financial Statements for Non-Financial Corporations. (February). New York, NY: Moody's.

Furthermore, in Table 4.11, we test whether our results are sensitive to the choice of the discount rate used to calculate firms' present value of future minimum lease payments. We selected two discount rates: 3% and 6%. Table 4.11 indicates that our results are robust to the choice of discount rates. In accordance with results shown in Table 4.8, this table indicates that borrowing companies approaching income statement covenant thresholds have greater off-balance sheet leasing magnitude.

Table 4-10 Robustness test to alternative measures of firms' off-balance sheet leasing

	BSCOVclose			***ISCOVclose***			**BSCOVclose**			**ISCOVclose**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
High_OBS*Lease*_Moodys	0.030	0.029	0.030	0.652***	0.644***	0.652***						
	(0.083)	(0.083)	(0.083)	(0.059)	(0.059)	(0.059)						
High_OBS*Lea*se_Graham							0.047	0.047	0.047	0.642***	0.634***	0.641***
							(0.084)	(0.084)	(0.084)	(0.060)	(0.060)	(0.060)
VR	0.006	0.006	0.006	0.001	0.002	0.003	0.006	0.006	0.006	0.001	0.003	0.003
	(0.008)	(0.008)	(0.008)	(0.006)	(0.006)	(0.006)	(0.008)	(0.008)	(0.008)	(0.006)	(0.006)	(0.006)
Leverage	1.631***	1.651***	1.627***	3.760***	3.800***	3.950***	1.630***	1.650***	1.626***	3.765***	3.806***	3.957***
	(0.245)	(0.241)	(0.236)	(0.198)	(0.195)	(0.194)	(0.245)	(0.241)	(0.236)	(0.198)	(0.195)	(0.194)
Size	-0.015		-0.016	-0.120***		-0.060***	-0.015		-0.016	-0.119***		-0.059***
	(0.027)		(0.023)	(0.021)		(0.017)	(0.027)		(0.023)	(0.021)		(0.017)
MTB	0.156***	0.150***	0.157***	-0.049	-0.111***	-0.076*	0.156***	0.150***	0.157***	-0.049	-0.111***	-0.077*
	(0.048)	(0.046)	(0.047)	(0.042)	(0.041)	(0.042)	(0.048)	(0.046)	(0.047)	(0.042)	(0.041)	(0.042)
ROA	-1.770***	-1.787***	-1.770***	-2.094***	-2.231***	-2.064***	-1.769***	-1.787***	-1.769***	-2.093***	-2.230***	-2.063***
	(0.335)	(0.333)	(0.335)	(0.308)	(0.309)	(0.310)	(0.335)	(0.333)	(0.335)	(0.308)	(0.309)	(0.310)
Loss	0.275***	0.290***	0.275***	0.802***	0.888***	0.823***	0.276***	0.290***	0.275***	0.802***	0.888***	0.824***
	(0.097)	(0.094)	(0.096)	(0.070)	(0.068)	(0.070)	(0.097)	(0.094)	(0.096)	(0.070)	(0.068)	(0.070)
Advert_expense	-0.972	-1.005	-0.975	2.202**	2.153**	2.241**	-1.004	-1.038	-1.008	2.194**	2.144**	2.234**
	(1.504)	(1.509)	(1.504)	(0.968)	(0.958)	(0.969)	(1.508)	(1.513)	(1.507)	(0.968)	(0.958)	(0.968)
RD_expense	1.776***	1.741***	1.779***	-4.577***	-4.986***	-4.951***	1.792***	1.757***	1.795***	-4.584***	-4.990***	-4.963***
	(0.526)	(0.522)	(0.523)	(0.666)	(0.668)	(0.672)	(0.527)	(0.523)	(0.524)	(0.666)	(0.669)	(0.673)
Tangibility	0.924***	0.917***	0.924***	-0.636***	-0.625***	-0.597***	0.923***	0.915***	0.922***	-0.640***	-0.629***	-0.602***
	(0.165)	(0.165)	(0.165)	(0.129)	(0.128)	(0.128)	(0.165)	(0.165)	(0.165)	(0.129)	(0.128)	(0.128)
Zscore	0.014	0.015	0.014	-0.064***	-0.050***	-0.059***	0.013	0.015	0.013	-0.064***	-0.050***	-0.058***
	(0.017)	(0.017)	(0.017)	(0.015)	(0.014)	(0.015)	(0.017)	(0.017)	(0.017)	(0.015)	(0.014)	(0.015)
Div_dummy	0.385***	0.373***	0.385***	-0.044	-0.125**	-0.034	0.387***	0.375***	0.386***	-0.046	-0.126**	-0.036
	(0.091)	(0.089)	(0.091)	(0.064)	(0.062)	(0.064)	(0.091)	(0.089)	(0.091)	(0.064)	(0.062)	(0.064)
Loan_Size	-0.002	-0.011		0.110***	0.037**		-0.002	-0.011		0.111***	0.038**	
	(0.030)	(0.025)		(0.022)	(0.018)		(0.030)	(0.025)		(0.022)	(0.018)	
Dividend_restriction	-0.470***	-0.460***	-0.470***	0.303***	0.364***	0.311***	-0.470***	-0.460***	-0.470***	0.302***	0.363***	0.309***

	(0.090)	(0.089)	(0.090)	(0.073)	(0.072)	(0.072)	(0.090)	(0.089)	(0.090)	(0.073)	(0.072)	(0.072)
Maturity	-0.015	-0.013	-0.016	0.017	0.024	0.065	-0.016	-0.014	-0.016	0.016	0.023	0.064
	(0.057)	(0.057)	(0.056)	(0.043)	(0.043)	(0.042)	(0.057)	(0.057)	(0.056)	(0.043)	(0.043)	(0.042)
Secured	0.026	0.027	0.027	0.418***	0.483***	0.364***	0.026	0.027	0.027	0.420***	0.484***	0.365***
	(0.102)	(0.100)	(0.100)	(0.074)	(0.073)	(0.073)	(0.102)	(0.100)	(0.100)	(0.074)	(0.073)	(0.073)
_cons	-2.620***	-2.556***	-2.644***	-2.835***	-2.308***	-1.366***	-2.623***	-2.559***	-2.647***	-2.839***	-2.316***	-1.364***
	(0.498)	(0.486)	(0.283)	(0.365)	(0.351)	(0.208)	(0.498)	(0.486)	(0.282)	(0.364)	(0.351)	(0.208)
N	7947	7956	7947	7947	7956	7947	7947	7956	7947	7947	7956	7947
Chi^2	253.30	253.26	253.30	1945.89	1915.27	1921.33	253.49	253.44	253.49	1941.17	1910.71	1916.34
Pseudo R^2	0.0461	0.0460	0.0461	0.1867	0.1835	0.1843	0.0461	0.0461	0.0461	0.1862	0.1830	0.1838

Notes: In this table, we explore whether our results are robust to alternative measures of firms' off-balance sheet leasing. The sample study covers 7,947 firm-year observations from 2002-2018. To account for financial covenant proximity, we follow Franz et al. (2014) and Fan et al. (2019) and identify a borrowing company as approaching financial covenant violations if its reported financial ratio is within 15% of the threshold stated in the loan contract. In addition, we follow Demerjian (2011) and classify firms' financial covenants into income statement and balance-sheet based covenants. Accordingly, in Columns (1)-(3) and (7)-(9), the model dependent variable (*BSCOVclose)* is a dummy variable that takes a value of one if the observed borrowing company is close to violating at least one of its balance-sheet based financial covenant thresholds and is zero otherwise. In Columns (4)-(6) and (10)-(12), the model dependent variable (*ISCOVclose*) is a dummy variable that takes a value of one if the observed firm is close to breaching at least one of the income-statement based financial ratio covenants stated in the loan contract and is zero otherwise. To calculate firms' off-balance sheet leasing commitments, we use two alternative proxies to the S&P method previously reported. First, we follow Moody's measure (*High_OBSLease_Moodys*) that estimates firms' off-balance sheet leasing as the maximum value between the S&P measure and the current lease rental multiplied by a factor of eight. In addition, in accordance with Graham et al. (1998), we measure firms' off-balance sheet leasing as the current rental payment plus the present value of the future minimum lease payments due between one and five years (*High_OBSLease_Graham*). In comparison with the S&P methodology, Graham et al. (1998) takes into account only medium- and short-term off-balance sheet leasing commitments. For both measures and in accordance with prior studies, we use a discount rate of 10%. Furthermore, in line with Demerjian (2011), we control for the volatility ratio of the balance sheet (*VR*). The variable *VR* measures the balance sheet's ability to provide accurate information regarding the borrower's financial health and is defined as the ratio between the book value volatility and the adjusted net income volatility. We also control for additional firm-specific variables (*Leverage, Size, MTB, ROA, Loss, Advert_expense, RD_expense, Tangibility, Zscore, and Div_dummy*), as well as loan-specific variables (*Loan_Size, Dividend_restriction, Maturity,* and *Secured*). Among the total sample of 7,947 firm-year observations, 1,026 correspond to firm-year observations where the borrowing company was close to violating at least one of its balance-sheet based covenants (*BSclose==1)* and 3,434 correspond to firm-year observations where the borrowing firm was close to breaching at least one of the income-statement based covenants specified in the loan contract (*ISclose==1).* Standard errors are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level of risk. All variables are defined in Appendix B.

Table 4-11 Robustness test using alternative discount rates to estimate firms' off-balance sheet leasing

	Discount Rate=3 percent						Discount Rate=6 percent					
	BSCOVclose			ISCOVclose			BSCOVclose			ISCOVclose		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
OBS*Lease_3 percent*	-0.834***	-0.823***	-0.834***	1.799***	1.829***	1.813***						
	(0.210)	(0.210)	(0.210)	(0.126)	(0.126)	(0.126)						
OBS*Lease_6 percent*							-0.883***	-0.870***	-0.882***	2.027***	2.065***	2.044***
							(0.231)	(0.230)	(0.231)	(0.141)	(0.141)	(0.141)
VR	0.007	0.008	0.007	-0.002	-0.001	-0.000	0.007	0.008	0.007	-0.002	-0.001	-0.001
	(0.008)	(0.008)	(0.008)	(0.006)	(0.006)	(0.006)	(0.008)	(0.008)	(0.008)	(0.006)	(0.006)	(0.006)
Leverage	1.532***	1.566***	1.539***	4.147***	4.185***	4.327***	1.534***	1.569***	1.540***	4.154***	4.192***	4.334***
	(0.247)	(0.243)	(0.237)	(0.203)	(0.200)	(0.199)	(0.247)	(0.243)	(0.237)	(0.203)	(0.200)	(0.199)
Size	-0.024		-0.023	-0.099***		-0.045***	-0.024		-0.023	-0.097***		-0.044**
	(0.027)		(0.023)	(0.021)		(0.017)	(0.027)		(0.023)	(0.021)		(0.017)
MTB	0.159***	0.149***	0.158***	-0.041	-0.095**	-0.067	0.159***	0.149***	0.158***	-0.042	-0.095**	-0.068
	(0.048)	(0.046)	(0.047)	(0.043)	(0.042)	(0.043)	(0.048)	(0.046)	(0.047)	(0.043)	(0.042)	(0.043)
ROA	-1.682***	-1.709***	-1.682***	-2.526***	-2.652***	-2.507***	-1.684***	-1.712***	-1.684***	-2.548***	-2.672***	-2.530***
	(0.326)	(0.325)	(0.326)	(0.311)	(0.311)	(0.313)	(0.326)	(0.326)	(0.326)	(0.310)	(0.310)	(0.313)
Loss	0.297***	0.318***	0.297***	0.742***	0.814***	0.761***	0.296***	0.317***	0.296***	0.741***	0.811***	0.759***
	(0.096)	(0.094)	(0.096)	(0.070)	(0.069)	(0.070)	(0.096)	(0.094)	(0.096)	(0.070)	(0.069)	(0.070)
Advert_expense	-0.135	-0.169	-0.131	1.180	1.098	1.194	-0.180	-0.215	-0.175	1.177	1.095	1.190
	(1.423)	(1.430)	(1.422)	(0.954)	(0.946)	(0.954)	(1.428)	(1.435)	(1.426)	(0.955)	(0.947)	(0.955)
RD_expense	1.656***	1.607***	1.650***	-5.399***	-5.717***	-5.727***	1.659***	1.610***	1.654***	-5.401***	-5.711***	-5.726***
	(0.519)	(0.515)	(0.516)	(0.674)	(0.673)	(0.677)	(0.519)	(0.515)	(0.516)	(0.673)	(0.672)	(0.677)
Tangibility	1.003***	0.993***	1.003***	-0.938***	-0.934***	-0.901***	0.995***	0.985***	0.995***	-0.924***	-0.921***	-0.888***
	(0.165)	(0.165)	(0.165)	(0.133)	(0.132)	(0.132)	(0.165)	(0.165)	(0.165)	(0.132)	(0.132)	(0.132)
Zscore	0.025	0.028*	0.025	-0.093***	-0.081***	-0.087***	0.025	0.027*	0.025	-0.094***	-0.083***	-0.089***
	(0.017)	(0.016)	(0.017)	(0.016)	(0.015)	(0.016)	(0.017)	(0.016)	(0.017)	(0.016)	(0.016)	(0.016)
Div_dummy	0.351***	0.334***	0.351***	-0.016	-0.082	-0.006	0.353***	0.336***	0.353***	-0.018	-0.081	-0.007

	(0.091)	(0.090)	(0.091)	(0.064)	(0.063)	(0.064)	(0.091)	(0.090)	(0.091)	(0.064)	(0.063)	(0.064)
Loan_Size	0.003	-0.012		0.100***	0.040**		0.003	-0.012		0.100***	0.041**	
	(0.030)	(0.025)		(0.023)	(0.018)		(0.030)	(0.025)		(0.023)	(0.018)	
Dividend_restriction	-0.452***	-0.438***	-0.451***	0.237***	0.287***	0.242***	-0.453***	-0.439***	-0.453***	0.237***	0.286***	0.242***
	(0.090)	(0.089)	(0.090)	(0.073)	(0.072)	(0.073)	(0.090)	(0.089)	(0.090)	(0.073)	(0.072)	(0.073)
Maturity	-0.014	-0.011	-0.012	0.025	0.030	0.069	-0.014	-0.012	-0.013	0.027	0.032	0.070*
	(0.057)	(0.057)	(0.056)	(0.044)	(0.043)	(0.042)	(0.057)	(0.057)	(0.056)	(0.044)	(0.043)	(0.042)
Secured	0.039	0.044	0.037	0.373***	0.426***	0.323***	0.039	0.044	0.037	0.371***	0.423***	0.322***
	(0.102)	(0.101)	(0.100)	(0.075)	(0.074)	(0.074)	(0.102)	(0.101)	(0.100)	(0.075)	(0.074)	(0.074)
_cons	-2.607***	-2.510***	-2.569***	-2.638***	-2.203***	-1.302***	-2.601***	-2.503***	-2.565***	-2.650***	-2.226***	-1.321***
	(0.499)	(0.487)	(0.283)	(0.367)	(0.354)	(0.210)	(0.499)	(0.487)	(0.283)	(0.368)	(0.354)	(0.210)
N	7947	7956	7947	7947	7956	7947	7947	7956	7947	7947	7956	7947
Chi^2	272.06	271.62	272.05	2060.72	2042.54	2040.75	270.48	270.02	270.47	2065.32	2048.17	2045.57
Pseudo R^2	0.0495	0.0494	0.0495	0.1977	0.1956	0.1958	0.0492	0.0491	0.0492	0.1981	0.1962	0.1962

Notes: In this table, we explore whether our results remain robust if we use alternative discount rates to estimate borrowing companies' off-balance sheet leasing. The sample study covers 7,947 firm-year observations from 2002-2018. To account for financial covenant proximity, we follow Franz et al. (2014) and Fan et al. (2019) and identify a borrowing company as approaching financial covenant violations if its reported financial ratio is within 15% of the threshold stated in the loan contract. In addition, we follow Demerjian (2011) and classify firms' financial covenants into income statement and balance-sheet based covenants. Accordingly, in Columns (1)-(3) and (7)-(9), the model dependent variable (*BSCOVclose)* is a dummy variable that takes a value of one if the observed borrowing company is close to violating at least one of its balance-sheet based financial covenant thresholds and is zero otherwise. In Columns (4)-(6) and (10)-(12), the model dependent variable (*ISCOVclose*) is a dummy variable that takes a value of one if the observed firm is close to breaching at least one of the income-statement based financial ratio covenants stated in the loan contract and is otherwise. To calculate firms' off-balance sheet leasing commitments (*OBSLease_3%* and *OBSLease_6%*), we follow S&P's methodology, which is widely used in the literature (Demerjian, 2011; Cornaggia et al., 2013; Altamuro et al., 2014; Paik et al., 2015; Lim et al., 2017), and define firms' off-balance sheet leasing magnitude as the present value of future minimum lease payments due in five years plus an estimation of the present value of the aggregate minimum lease payments due beyond five years (Thereafter component). We use discount rates of 3% and 6%, respectively. Furthermore, in accordance with Demerjian (2011), we define the volatility ratio of the balance sheet (*VR*). The variable *VR* measures the balance sheet's ability to provide accurate information regarding the borrower's financial health and is defined as the ratio between the book value volatility and the adjusted net income volatility. We also control for additional firm-specific variables (*Leverage, Size, MTB, ROA, Loss, Advert_expense, RD_expense, Tangibility, Zscore,* and *Div_dummy*), as well as loan-specific variables (*Loan_Size, Dividend_restriction, Maturity,* and *Secured*). Among the total sample of 7,947 firm-year observations, 1,026 correspond to firm-year observations where the borrowing company was close to violating at least one of its balance-sheet based covenants (*BSclose==1)* and 3,434 correspond to firm-year observations where the borrowing firm was close to breaching at least one of the income-statement based covenants specified in the loan contract (*ISclose==1).* Standard errors are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level of risk. All variables are defined in Appendix B.

4.7.4 Sensitivity test to the exclusion of the financial crisis period

Kousenidis, Ladas, and Negakis (2013) argue that during the Global Financial Crisis period of 2008 and 2009, managers' incentives to manipulate firms' accounting information increased significantly. In addition, Demerjian (2011) indicates that loan specific characteristics could differ significantly during periods of financial distress. Accordingly, to test whether our results are not driven by the Global Financial Crisis period, we exclude this period from our analysis and repeat the study's main regression in Table 4.12. As indicated by Table 4.12, our results remain robust if we exclude the period of the Great Financial Crisis. Accordingly, borrowing firms approaching income statement covenant violations are more likely to be exposed to a significant use of off-balance sheet lease financing (coefficient on the variable *High_OBSLease* remains significant with a p_value <0.0001).

Table 4-12 Robustness test to the exclusion of the Global Financial Crisis

	BSCOVclose			ISCOVclose		
	(1)	(2)	(3)	(4)	(5)	(6)
HighOBS*Lease*	0.045	0.044	0.045	0.614***	0.606***	0.614***
	(0.089)	(0.089)	(0.089)	(0.064)	(0.064)	(0.064)
VR	0.009	0.009	0.009	0.002	0.003	0.003
	(0.008)	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)
Leverage	1.499***	1.507***	1.490***	4.071***	4.094***	4.258***
	(0.269)	(0.265)	(0.259)	(0.221)	(0.217)	(0.217)
Size	-0.008		-0.010	-0.127***		-0.067***
	(0.029)		(0.024)	(0.023)		(0.018)
MTB	0.161***	0.159***	0.162***	-0.025	-0.090**	-0.053
	(0.050)	(0.049)	(0.050)	(0.045)	(0.043)	(0.044)
ROA	-1.754***	-1.764***	-1.755***	-2.467***	-2.618***	-2.439***
	(0.364)	(0.362)	(0.364)	(0.338)	(0.339)	(0.341)
Loss	0.341***	0.350***	0.340***	0.846***	0.931***	0.865***
	(0.104)	(0.102)	(0.104)	(0.076)	(0.074)	(0.076)
Advert_expense	-0.958	-0.989	-0.965	1.691*	1.668*	1.740*
	(1.593)	(1.597)	(1.592)	(1.015)	(1.005)	(1.016)
RD_expense	1.687***	1.667***	1.694***	-4.795***	-5.225***	-5.142***
	(0.551)	(0.547)	(0.548)	(0.713)	(0.716)	(0.719)
Tangibility	0.965***	0.959***	0.964***	-0.787***	-0.772***	-0.754***
	(0.176)	(0.175)	(0.176)	(0.139)	(0.138)	(0.138)
Zscore	0.001	0.002	0.001	-0.070***	-0.056***	-0.064***
	(0.019)	(0.019)	(0.019)	(0.016)	(0.016)	(0.016)
Div_dummy	0.347***	0.340***	0.347***	-0.018	-0.104	-0.011
	(0.098)	(0.096)	(0.098)	(0.069)	(0.067)	(0.068)
Loan_Size	-0.004	-0.009		0.109***	0.030	
	(0.032)	(0.027)		(0.024)	(0.019)	
Dividend_restriction	-0.409***	-0.403***	-0.409***	0.262***	0.328***	0.270***
	(0.097)	(0.095)	(0.097)	(0.078)	(0.076)	(0.077)
Maturity	0.007	0.008	0.005	0.014	0.022	0.061
	(0.061)	(0.061)	(0.060)	(0.046)	(0.046)	(0.045)
Secured	-0.001	-0.005	0.001	0.430***	0.494***	0.376***
	(0.108)	(0.107)	(0.107)	(0.080)	(0.079)	(0.079)
_cons	-2.705***	-2.669***	-2.759***	-2.697***	-2.124***	-1.252***

	(0.533)	(0.520)	(0.303)	(0.393)	(0.377)	(0.224)
N	6955	6964	6955	6955	6964	6955
Chi^2	210.18	210.48	210.16	1754.98	1725.87	1734.59
Pseudo R^2	0.0437	0.0437	0.0437	0.1929	0.1894	0.1906

Notes: In this table, we test whether our results are driven by the period of the Global Financial Crisis (2008-2009), which, according to some authors, could be characterized by a greater use of accounting "window dressing" tools (Kousenidis et al., 2013). Therefore, this table reports the results of our main logistic regression model after exclusion of the years 2008 and 2009. To account for financial covenants proximity, we follow Franz et al. (2014) and Fan et al. (2019) and identify a borrowing company as approaching financial covenant violations if its reported financial ratio is within 15% of the threshold stated in the loan contract. In addition, we follow Demerjian (2011) and classify firms' financial covenants into income statement and balance-sheet based covenants. Accordingly, in Columns (1)-(3), the model dependent variable (*BSCOVclose*) is a dummy variable that takes a value of one if the observed borrowing company is close to violating at least one of its balance-sheet based financial covenant thresholds and is zero otherwise. In Columns (4)-(6), the model dependent variable (*ISCOVclose*) is a dummy variable that takes a value of one if the observed firm is close to breaching at least one of the income-statement based financial ratio covenants stated in the loan contract and is zero otherwise. Our variable of interest is *High_OBSLease*. It is defined as a dummy variable that takes a value of one for firms belonging to industries in the highest quartile (top 25%) of the distribution of the ratio of the present value of off-balance sheet lease commitments divided by total assets and is zero otherwise. To calculate firms' off-balance sheet leasing commitments, we follow S&P's methodology, which is widely used in the literature (Demerjian, 2011; Cornaggia et al., 2013; Altamuro et al., 2014; Paik et al., 2015; Lim et al., 2017), and define firms' off-balance sheet leasing magnitude as the present value of the future minimum lease payments due in five years plus an estimation of the present value of the aggregate minimum lease payments due beyond five years (Thereafter component). In accordance with prior studies, we use a discount rate of 10%. Furthermore, in accordance with Demerjian (2011), we define the volatility ratio of the balance sheet (*VR*). The variable *VR* measures the balance sheet's ability to provide accurate information regarding the borrower's financial health and is defined as the ratio between the book value volatility and the adjusted net income volatility. We also control for additional firm-specific variables (*Leverage, Size, MTB, ROA, Loss, Advert_expense, RD_expense, Tangibility, Zscore,* and *Div_dummy*), as well as loan-specific variables (*Loan_Size, Dividend_restriction, Maturity,* and *Secured*). Among the total sample of 7,947 firm-year observations, 1,026 correspond to firm-year observations where the borrowing company was close to violating at least one of its balance-sheet based covenants (BSclose==1) and 3,434 correspond to firm-year observations where the borrowing firm was close to breaching at least one of the income-statement based covenants specified in the loan contract (ISclose==1). Standard errors are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level of risk. All variables are defined in Appendix B.

4.8 Conclusions

This chapter examines whether borrowing firms approaching a financial covenant violation are more likely to use off-balance sheet lease financing. Consistent with our expectations, we find that firms close to violating at least one income-statement based covenant ratio specified in the loan contract are more likely to use significant off-balance sheet lease financing. In addition, we find that these firms are likely to be small companies with significant leverage constraints and a poor performance outlook.

Our results contribute to the previous literature in several ways. First, our findings build on Paik et al. (2015) who argue that the frequency of use of income-statement based covenants in loan contracts increases with borrowing firms' use of off-balance sheet leasing. We extend this result by looking at the proximity to income-statement based covenants that provides a more reliable signal as to how borrowing firms' behaviour could change once the loan contract is initiated. In addition, as off-balance sheet lease financing is a form of accounting "window dressing" (Dechow et al., 2011; Beatty et al., 2010), we contribute to prior studies concerning the relationship between financial covenant proximity and borrowing firms' reporting manipulation practices (Defond and Jiambalvo, 1994; Dichev and Skinner, 2002; Franz et al., 2014; Fan et al., 2019; Malikov et al., 2019). Our findings suggest that off-balance sheet leasing is an additional reporting tool that managers of highly constrained firms use to avoid costly financial covenant violations.

In addition, the findings of this study have important implications for regulators and financial statement users looking at the effects of the new leasing standard, IFRS16 *leases*, on the accounting information used in private loan contracts. While prior studies argue that banks and creditors already account for firms' use of off-balance sheet leasing and that the new leasing standard is less likely to affect accounting information in the debt contracting process (Demerjian, 2011ƒ; Altamuro et al., 2014; Paik et al., 2015), we find that once the loan contract is initiated, borrowing firms approaching income statement covenant thresholds are more likely to use off-balance sheet lease financing. The significant use of off-balance sheet leasing is likely to reflect borrowing firms' managers' incentives to manipulate reported financial ratios in order to avoid a debt

covenant violation. We extend prior studies by demonstrating that even if a lender takes into account a firms' use of off-balance sheet leasing at the time of contract initiation, the same firm may still manipulate its reported accounting information to avoid a covenant breach. This implies that when setting financial covenant thresholds, lenders must consider borrowing firms' exposure to off-balance sheet leasing not only at the start of the contract, but also monitor any change in off-balance sheet lease financing throughout the duration of the contract. Future studies could look at financial covenant renegotiation and examine whether these renegotiations adjust to abnormal increases of borrowing firms' off-balance sheet leasing activity.

Chapter 5 Conclusion

In anticipation of the new lease accounting rules (IFRS 16 *leases*), this thesis analysed firms' use of off-balance sheet financing in the period prior to IFRS 16 *leases*. In this final chapter, we present the overall summary and concluding remarks for each investigation. In a second step, we report the accounting policy implications of this study, as well as identifying further potential areas of research.

5.1 Chapter 2: Drivers of off-balance sheet leasing: Evidence from the UK

Chapter 2 is the starting point of the current thesis as it seeks to understand why firms use off-balance sheet leasing and if there are any specific drivers underpinning this use. First, using manually collected data of 161 UK firms from 2000-2016, we find a significant boom in UK firms' use of off-balance sheet lease financing. A similar trend is highlighted in previous studies with a focus on U.S. companies (Cornaggia et al., 2013). In addition, our findings indicate that after controlling for the theoretical determinants of leasing, a residual component of firms' leasing activity is significantly negatively related to firms' level of debt. This "excess leasing" or "abnormal leasing" reflects firm leasing activity that is not driven by common leasing incentives, such as tax incentives. This result suggests that the accounting treatment of operating leases (i.e., its off-balance sheet treatment) is driving the significant surge in operating lease activity signalled by our dataset. Moreover, this chapter highlights that the negative relationship between a firm's off-balance sheet leasing and its level of debt is only significant for cash constrained firms and firms with a greater likelihood of financial distress. This suggests that off-balance sheet leasing is particularly valued by firms facing financial constraints as a means to access additional financing without altering their level of reported debt.

5.2 Chapter 3: Effect of targets' off-balance sheet leasing on the likelihood of unsuccessful M&As

Chapter 3 provides new insight into the effect of firms' use of off-balance sheet leasing by employing evidence from one of the most important strategic corporate finance

decisions, mergers and acquisitions. Building on prior studies regarding the quality and accuracy of accounting information conveyed by a target firm's financial statement (Raman, Shivakumar, and, Tamayo, 2013; Skaife and Wangerin, 2013; Marquardt and Zur, 2014; Mc Nichols and Stubben, 2015; Martin and Shalev, 2017), our study provides new evidence supporting the fact that significant use of off-balance sheet lease financing by a target company significantly increases the probability that an announced M&A deal is subsequently terminated. These results also confirm Beatty et al. (2010) findings' that the greater the amount of a firm's off-balance sheet leasing, the lower the quality of its accounting information. Therefore, off-balance sheet leasing is seen by acquirers as hidden debt, which, if uncovered during the process of transactional due diligence, leads to a greater probability of deal termination.

The novelty of this chapter is the role of target off-balance sheet leasing in the M&A process, a relationship that, to the best of our knowledge, has not been considered in prior studies. Using a sample of 1,711 U.S. domestic M&A's announced from 1983-2018, Chapter 3 finds that a target's off-balance sheet leasing has a negative and significant effect on the likelihood of an unsuccessful M&A. In other words, the existence and use of significant amounts of off-balance sheet leasing by the target company decreases the accounting quality and the transparency of its financial statement that may ultimately lead to merger withdrawal. The results support the previous studies by analysing an additional and crucially important attribute of firms' accounting quality: the existence and use of off-balance sheet leasing.

Additionally, Chapter 3 presents evidence that the relationship between a target firm's off-balance sheet leasing and the likelihood of an M&A's termination is only significant in the period preceding the global financial crisis of 2008. This is consistent with the lack of transparency and decreased trust worthiness in a firm's reported financial information that characterised this period. In contradiction with our initial predictions, this empirical analysis further suggests that acquirers make more profitable acquisition decisions when they target firms with substantial off-balance sheet leasing activity. This is in line with prior studies that suggest bringing operating lease commitments into the balance-sheet artificially boosts performance measures, such as return on assets, due to unreported assets arising from the lease agreement (Imhoff et al., 1991; Beattie et al., 1998; Cornaggia et al., 2013; Giner et al., 2019). Our results remain robust to the choice of

various measures that estimate the amount of off-balance sheet leasing that would be brought into the balance sheet after the new leasing standard comes into effect.

5.3 Chapter 4: Do firms use more off-balance sheet leasing when approaching a debt covenant violation?

Chapter 2's findings support the fact that financially constrained firms and firms with a greater likelihood of financial distress are more likely to use off-balance sheet leasing in a significant way. One possible motivation underpinning this result is that the company is seeking to maintain its debt level below a certain level in order to avoid a costly event like a debt covenant violation. Chapter 4 investigates this hypothesis by analysing whether managers of borrowing firms close to financial covenant violations are more likely to use significant off-balance sheet lease financing. To this end, we use a logistic regression on a sample of 861 U.S. borrowing companies from 2002-2018. In line with the previous literature (Demerjian and Owens, 2016), we distinguish between debt covenants based on accounting information extracted from the balance sheet (i.e., balance-sheet based covenants) and those based on information extracted from the income statement (i.e., income-statement based covenants).

This chapter presents evidence that borrowing firms with significant use of off-balance sheet lease financing have a greater likelihood of being close to breaching at least one of the income-statement based financial covenants indicated in the loan contract. Chapter 4 further shows that these firms are significantly more restrained in terms of expenditures and dividend payouts and have poorer performance prospects. This is in line with the initial findings of Chapter 2 that highly constrained firms have a greater likelihood of using off-balance sheet financing.

However, our results do not support the existence of a significant relationship between a firm's closeness to balance-sheet based covenants and the use of off-balance sheet lease financing. This result is consistent with a decline in the usefulness of balance sheet information for contracting purposes due to its high exposure to accounting "window dressing" practices (Holthausen and Watts, 2001; Watts, 2003; Kothari et al., 2010).

This chapter extends previous studies as follows. First, our findings build on Paik et al. (2015) who argue that the frequency of use of income-statement based covenants in loan

contracts increases with borrowing firms' use of off-balance sheet leasing. We extend this result by looking at the proximity to income-statement based covenants that provides a more reliable signal as to how a borrowing firm's behaviour could change once the loan contract is initiated. In addition, as off-balance sheet lease financing is a form of accounting "window dressing" (Dechow et al., 2011; Beatty et al., 2010), we contribute to prior studies concerning the relationship between financial covenant proximity and borrowing firms' reporting manipulation practices (DeFond and Jiambalvo, 1994; Dichev and Skinner, 2002; Franz et al., 2014; Fan et al., 2019; Malikov et al., 2019). Our findings suggest that off-balance sheet leasing is an additional reporting tool that managers of highly constrained firms use to avoid costly financial covenant violations.

5.4 Accounting policy implications and further research opportunities

In line with regulators' and accounting standard setters' ambitions that the new leasing accounting standards will enhance firms' financial statement transparency, our investigation provides empirical evidence that bringing off-balance sheet leasing into the balance sheet will result in greater financial reporting transparency. This financial reporting improvement will be translated through many channels. First, it will eliminate accounting "window dressing" incentives including increasing the level of off-balance sheet financing to increase debt capacity or protect debt covenants. In addition, in the context of M&As, the single on-balance sheet leasing model provided by the new IFRS 16 *leases* will remove the need for costly estimation of the target's off-balance sheet lease commitments simplifying the process of transactional due diligence. Moreover, in line with prior studies and as the current thesis suggests, the off-balance sheet treatment of operating leases is a key driver behind many firms' decisions to lease instead of buy the underlying asset. The new IFRS 16 *leases* will automatically remove this advantage. One remaining open question is whether firms' lease vs. buy decisions will substantially change in the future.

In addition, this thesis supports the fact that the new leasing standard will substantially change the way companies enter into contractual debt agreements. Finally, the current thesis methodology is based on an estimation of what would be brought into the balance sheet if IFRS 16 *leases* is effective. Thus, it is an anticipation of the expected effect of this new leasing standard. Further studies should look at the actual effect of IFRS 16 *leases*

adoption taking into account how companies effectively adopted the standard (e.g., early adopters), which method has been adopted to capitalise off-balance sheet agreements, and if there are any disparities between industries or countries.

Appendix A

A.1 Variables definitions

Variable name	Description	Source
Graham et al.(1998) Leasing model		
OL	Operating leases calculated following the Graham et al. (1998) capitalisation procedure divided by a firm's value.	Manually collected from companies' annual reports available on FAME archives
Tax rate	Income Taxes/Pre-tax Income * 100	DataStream
Distress	Expected cost of financial distress = Standard deviation of the first difference in the firms' EBIT divided by the mean level of the book value of total assets multiplied by (Research and development + advertising expenses/Total Assets)	DataStream
Z score	3.3(EBIT/Total Assets) + 1.4(Retained Earnings/Total Assets) + 1.2(Working Capital/Total Assets)	DataStream
NegOE	Dummy equal to one if the book value of common equity is negative - zero otherwise	DataStream
Investment Opportunity (MTB)	(Total Assets - Book Equity + (Share Price * Shares Outstanding) + OL)/(Total Assets + OL)	DataStream
Collateral	Net Property, Plant, and Equipment/Total Assets	DataStream
Size	Log(Market Capitalisation)	DataStream
Lemmon et al.(2008) capital structure model		
Leverage	Total Debt/Total Assets	DataStream
Initial Leverage	First non-missing value of the variable Leverage	DataStream
Sales	Ln(Sales)	DataStream
MTB	Market-to-book Ratio (Market Equity+ Total Debt+ Preferred Stock Liquidating Value Deferred Taxes)/Total Assets	DataStream
Profitability	EBITDA/Total Assets	DataStream
Tangibility	Net PPE/Total Assets	DataStream
Industry Leverage	Median industry leverage	DataStream
CF volatility	The standard deviation of (Operating Income/Total Assets)	DataStream
Dividend Dummy	Dividend payer takes ae value of one if the firm pays dividend sat year *t* and zero otherwise	DataStream

A.2 Time series analysis of UK operating lease activity using additional proxies of off-balance sheet leasing

Figure 2 Average off-balance sheet leasing following the factor method

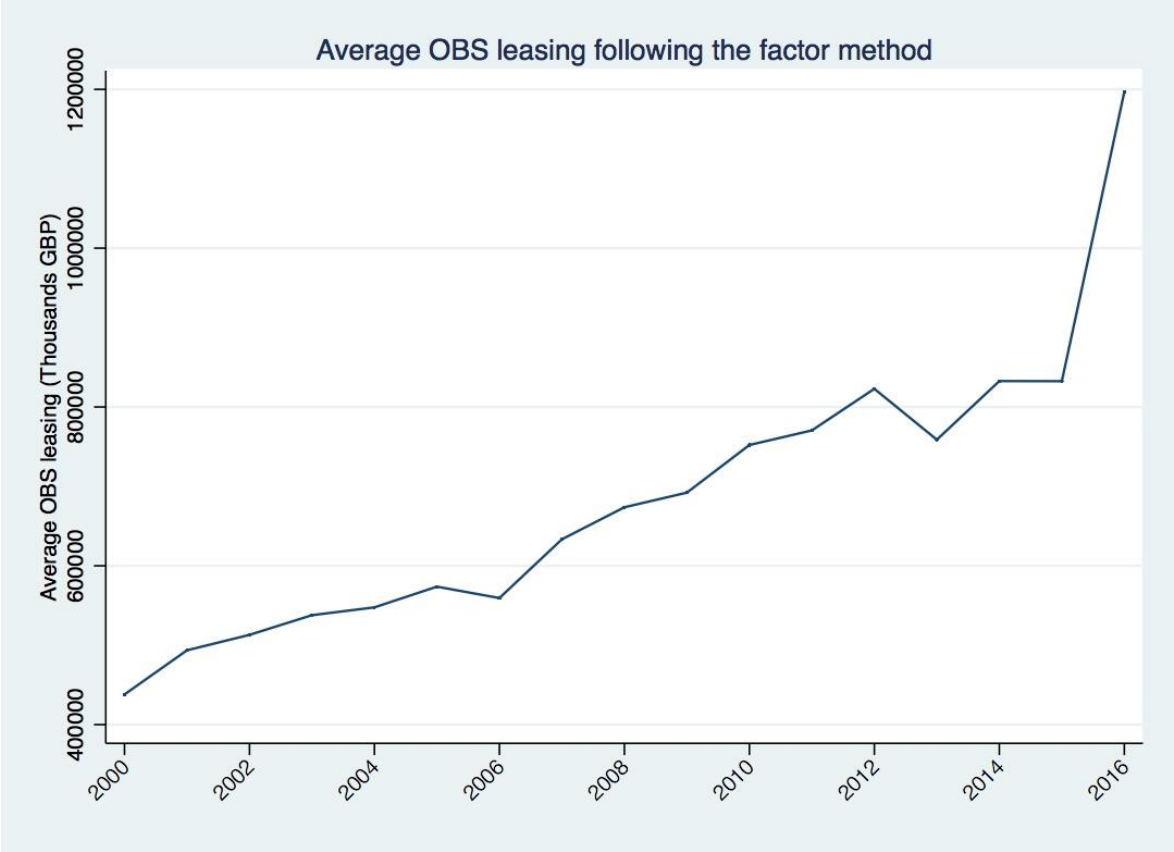


Figure 2 illustrates the annual average of the operating leases for a sample of 161 companies from 2000-2016. Operating lease commitments are estimated using the factor method also known as Moody's factor method, which consists of multiplying the current operating lease rental expense by a factor of eight.

Figure 3 Average off-balance sheet leasing following Dogan (2016)

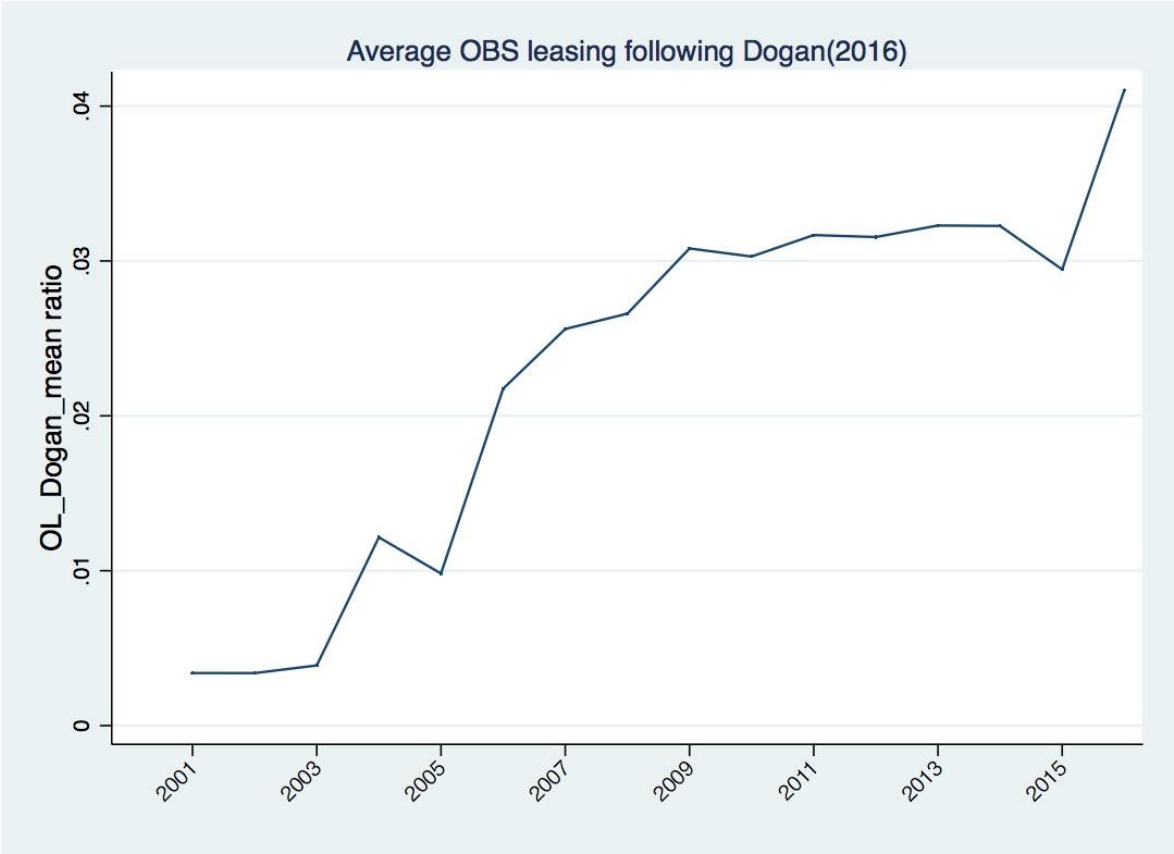


Figure 3 represents annual operating leasing activity for a sample of 161 UK firms from 2000-2016. *OL_Dogan_mean* ratio is a proxy for the company level of operating lease commitments following Dogan (2016) and is equal to the lagged value of the next year minimum non-cancellable operating lease payments divided by the firm's total assets.

A.3 Trend regressions with different operating lease proxies

	OL_Graham	**OL_Moody**	**OL_Dogan**
Trend	23518.0***	47993.7***	0.00173***
	(3522.4)	(8152.6)	(0.000369)
Constant	95689.4***	321203.3***	0.0100***
	(21597.9)	(51292.9)	(0.00254)
R^2	0.029	0.021	0.014
AIC	61331.9	65025.8	-5152.1
BIC	61343.2	65037.1	-5141.0
N	2080	2081	1904

Notes. This table presents trend regression results using three different proxies for operating leases. Dependent variables are the present value of the minimum operating lease payments calculated following Graham et al. (1998) (*OL_Graham*), the current operating lease payments multiplied by a factor of eight8 (*OL_Moody*), and the ratio of the lagged value of the next year's minimum operating lease commitments divided by the firm's total assets (*OL_Dogan*). The independent variable is a time trend. The sample contains 161 UK companies 2000-2016. *t* statistics are in parentheses. * p<0.10, ** p<0.05, and *** p<0.001.

A.4 Variance inflation factor: Graham et al. (1998) model

Variable	VIF	1/VIF
MTB	1.64	0.609273
Distress	1.63	0.613185
size	1.45	0.690437
Zscore	1.26	0.796615
NegOE	1.07	0.937638
Coll	1.04	0.963619
Tax	1.02	0.975958
Mean VIF	1.3	

A.5 Variance inflation factor: Lemmon et al. (2008) model

Variable	VIF	1/VIF
Sales	3.18	0.314743
Volatility	2.61	0.382466
Initial_lev	1.98	0.505266
MTB	1.32	0.759124
Ind_lev	1.28	0.780253
Tangibility	1.2	0.835159
Profitability	1.06	0.944718
Mean VIF	1.8	

Appendix B

B.1 Example of off-balance sheet leasing calculations

On the September 27, 2010, Southwest Airlines announced their acquisition of AirTran Holdings Inc. The acquisition is completed on the May 2, 2011. In 2009, one year before the acquisition announcement, notes to the financial statement of the company provide the following information about future minimum lease payments (MLP) reported in millions of dollars:

	Reported rental expense ($ million)	**Reported minimum lease payments**
$\text{Rental Expense}_{2009}$	328.5	
MLP_{2010}		288.663
MLP_{2011}		273.385
MLP_{2012}		271.156
MLP_{2013}		265.993
MLP_{2014}		255.532
Thereafter		1530.406

B.1.1 Estimating operating leases following Graham et al. (1998)

At the end of fiscal year 2010, following Graham et al. (1998) methodology, we estimate the present value of future off-balance sheet commitments of the target company (AirTran Holdings Inc) as follows:

$$Oplease_{Graham_t} = Rental\ Expense_0 + \sum_{t=1}^{5} \frac{MLP_t}{(1+K_d)^t}$$

where $Rental\ Expense_0$ is the target firm's current rental expense, MLP_t is the minimum lease payments due in the next five years, and K_d is the discount rate set at 10% following Graham et al. (1998).

	Reported rental expense ($ million)	**Reported minimum lease payments**	**Present value of MLP**	**$Oplease_{2009\_Graham}$**
Rental $Expense_{2009}$	328.5			
MLP_{2010}		288.663	262.4209	
MLP_{2011}		273.385	225.938	
MLP_{2012}		271.156	203.7235	
MLP_{2013}		265.993	181.6768	
MLP_{2014}		255.532	158.6653	
				1360.925

In 2009, one year prior to the acquisition announcement, AirTran Holdings Inc reported a conventional (on-balance sheet) debt of $ 1214.017 million for a total asset value of $ 2284.172 million. Thus, AirTran Holdings Inc.'s leverage ratio is:

Conventional TD/TA ratio = 1214.017/2284.172=53%

If we capitalise off-balance sheet leasing, the leverage ratio would be

= (1214.017+1360.925)/(2284.172+1360.925)= 71%

Therefore, bringing operating leases of the target firm onto the balance sheet increases the leverage ratio from 53% to 71%.

B.1.2 Estimating operating leases following S&P method:

Similar to Graham et al. (1998), the S&P present value method estimates the value of operating lease commitments as the sum of current lease rentals plus the present value of future minimum lease payments including operating lease commitments due after the fifth year (Lim et al., 2017). Minimum operating lease commitments due after the fifth year are denoted as the "Thereafter" component in a company's notes to the financial statement.

Thus, the estimation of AirTran Holdings Inc.'s total operating lease commitments following the S&P method is computed using the following equation:

$$Oplease_{S\&P\_t} = Rental\ Expense_0 + \sum_{t=1}^{5} \frac{MLP_t}{(1+K_d)^t} + \sum_{t=6}^{6+Addyrs} \frac{EMLP_t}{(1+K_d)^t}$$

The first two terms of Equation (2) are defined as in Equation (1). *Addyrs* refers to the remaining years in the life of the operating lease contract. $EMLP_t$ is the estimated annuity payable after the fifth year. As in Lim et al. (2017), we first estimated the remaining years in the operating lease contract (*Addyrs*= Thereafter/*MLP5*). Then, we estimate the annual *MLP* payable after the fifth year to the end of the lease life as: Thereafter/*Addyrs*. Finally, we calculate the present value of this annuity using a discount rate of 10 %.

	Reported rental expense ($ million)	**Reported minimum lease payments**	**Present value of MLP**	**Oplease2009, S&P**
Rental Expense$_{2009}$	328.5			
MLP$_{2010}$		288.663	262.4209	
MLP$_{2011}$		273.385	225.938	
MLP$_{2012}$		271.156	203.7235	
MLP$_{2013}$		265.993	181.6768	
MLP$_{2014}$		255.532	158.6653	
Thereafter$_{2015\text{-}Addyears}$[39]		1530.406	689.75	
				2050.6745

Following the S&P method, the debt value of AirTran Holdings Inc. operating leases is $2,050.6745 million. Conventional TD/TA ratio = 1,214.017/2,284.172=53%.

[39] Divide the total Thereafter by Year 5 MLP to estimate additional years of payments after the fifth year (*Addyears*): 1530.406/255.532=5.9 years. Round to six years. The estimated annual MLP payable from the 5th year to 11th year: 1530.406/6=$255.06.The present value of the six years annuity ($255.06) at the 10% discount rate is $689.75.

If we capitalise off-balance sheet leasing, the leverage ratio would be: (1,214.017+2,050.67)/(2,284.172+2050.67)=75%.

Therefore, following the S&P calculation, bringing operating leases of the target firm onto the balance sheet increases the leverage ratio from 53% to 75%.

B.1.3 Estimating operating leases following Moody's method:

Moody's estimate of firms' debt value of operating leases takes a maximum value between the S&P estimate and eight times the current rental expense.

For AirTran Holdings Inc., the estimated value of operating leases is:

$\text{Max}(\text{Oplease}_{2010,\ S\&P}\ ;\ 8^{*}\ \text{Rental Expense}_{2009}) = \text{max}(2{,}050.6745\ ;\ 2{,}628) = \$2{,}628$ million.

Following Moody's method, the debt value of AirTran Holdings Inc.'s operating leases is: $2,628 million. Conventional TD/TA ratio = 1214.017/2284.172=53%.

If we capitalise off-balance sheet leasing, the leverage ratio would be: (1,214.017+2,628)/(2,284.172+2,628)= 78%.

Therefore, following Moody's calculation, bringing off-balance sheet leasing of the target firm onto the balance sheet increases the leverage ratio from 53% to 78%.

B.2 Construction of target opacity measure (*Opaque_T*)

Step 1: Definition of target abnormal discretionary accruals ($Abn\_Accruals_{i,t}$)

We follow Dechow et al. (1995) and Hutton et al. (2009) and measure abnormal accruals from the modified Jones (1991) model. For each target company *i* observed at year *t* where year *t* denotes one year before the acquisition year, we estimate the following model using OLS regressions by year and industry:

$$\frac{TAccr_{i,t}}{TA_{i,t-1}} = \alpha_0 \frac{1}{TA_{i,t-1}} + \beta_1 \frac{\Delta Sales_{i,t} - \Delta Receivables_{i,t}}{TA_{i,t-1}} + \beta_2 \frac{PPE_{i,t}}{TA_{i,t-1}} + \varepsilon_{i,t}$$

where,

$TAccr_{i,t}$	Is the total accruals of target firm *i* at the end of year *t*. It represents the annual change in non-cash current assets minus the annual change in non-interest bearing current liabilities minus the annual amount of depreciation and amortization for a firm *i* at year *t*. Year *t* corresponds to the year before the acquisition year.
$TA_{i,t-1}$	Is target firm *i*'s total assets observed at year *t*-1.
$\Delta Sales_{i,t}$	Denotes the variation of a firm's total sales between years *t* and *t*-1.
$\Delta Receivables_{i,t}$	Denotes the change in a firm's total receivables between years *t* and *t*-1.
$PPE_{i,t}$	Denotes a firm's property, plant, and equipment at the end of year *t*.

Therefore, we define abnormal accruals as the difference between firm *i*'s total observed and expected accruals.

$$Abn\_Accruals_{i,t} = \frac{TAccr_{i,t}}{TA_{i,t-1}} - (\hat{\alpha}_0 \frac{1}{TA_{i,t-1}} + \hat{\beta}_1 \frac{\Delta Sales_{i,t} - \Delta Receivables_{i,t}}{TA_{i,t-1}} + \hat{\beta}_2 \frac{PPE_{i,t}}{TA_{i,t-1}} + \varepsilon_{i,t})$$

Step 2: Definition of the absolute value of target abnormal discretionary accruals (*AbsV_Abn_Accrualsit*)

For each target firm *i* at year *t*, the variable *AbsV_Abn_Accrualsit* is defined as the absolute value of *Abn_Accrualsi,t*.

Step 3: Definition of target accounting opacity (Opaque_T)

Following Hutton et al. (2009), we define the variable *Opaque_T* as the target firm's three-years moving sum of the absolute value of abnormal annual discretionary accruals:

Opaque_T= *AbsV_Abn_Accrualsit*1 + *AbsV_Abn_Accrualsit*2 + *AbsV_Abn_Accrualsit*3

B.3 Variables definitions.

Variable Name	Variable definition
Dependent Variables	
Termination	A dummy variable that takes a value of one if the announced M&A deal is subsequently terminated after the announcement date and zero otherwise.
ΔROA	Post-acquisition performance measured by the change in ROA of the merged entity. ΔROA corresponds to the difference between the acquirer return on assets in the year following the acquisition and the acquirer and target combined return on assets in the year prior to the acquisition.
Target off-balance sheet leasing and accounting quality	
OBSL_T_Graham	Target measure of off-balance sheet leasing's (off-balance sheet leasing) magnitude one year before the M&A deal announcement. We follow Graham et al. (1998) methodology. Please refer to Appendix A for a detailed calculation of this variable.
OBSL_T_S&P	Target measure of off-balance sheet leasing's (off-balance sheet leasing) magnitude one year before the M&A deal announcement following S&P's proxy. Please refer to Appendix A for a detailed calculation of this variable.
OBSL_T_Moodys	Target measure of off-balance sheet leasing's (off-balance sheet leasing) magnitude one year before the M&A deal announcement following Moody's proxy. Please refer to Appendix A for a detailed calculation of this variable.
Opaque_T	The variable *Opaque_T* measure of a target's firm level of accounting quality proxied by the magnitude of abnormal discretionary accruals. Following Hutton et al. (2009), we define the variable *Opaque_T* as the target firm's three-years moving sum of the absolute value of abnormal annual discretionary accruals. Please refer to Appendix B.2 for a detailed calculation of this variable.
Opaque2_T	The variable *Opaque2_T* measure of a target's firm level of accounting quality proxied by the magnitude of abnormal discretionary revenues following McNichols and Stubben (2008) and Stubben (2010).
Deal controls	

Ind_related	Dummy variable that takes a value of one if the acquirer and target have the same primary two digit SIC codes and zero otherwise.
Hostile	Dummy variable that takes a value of one if the M&A deal is classified by SDC as hostile or unsolicited and zero otherwise.
Multibid	Dummy variable that takes a value of one if the M&A deal has multiple bidders for the same target and zero otherwise.
Tender Offer	Dummy variable that takes a value of one if the M&A deal is reported by SDC as a tender offer and zero otherwise.
All_Cash	Dummy variable that takes a value of one if the merger agreement is paid by cash and zero otherwise.
All_Shares	Dummy variable that takes a value of one if the merger agreement is paid by shares and zero otherwise.
Mixed	Dummy variable that takes a value of one if the merger agreement is paid by a combination of cash and shares and zero otherwise.
Target and Acquirer control variables	
Size_T	Target natural logarithm of total assets.
TobinQ_T	Target Tobin's Q one year before the acquisition year. It is calculated as the ratio between the market value and the book value of assets.
ROA_T	Target return on assets one year before the acquisition measured by the ratio between operating income before depreciation and total assets.
Leverage_T	Target leverage observed one year before the acquisition. It is calculated as total debt (long-term debt+ short-term debt) scaled by total assets.
Size_A	Acquirer natural logarithm of total assets.
Leverage_A	Acquirer leverage observed one year before the acquisition. It is calculated as total debt (long-term debt+ short-term debt) scaled by total assets.
TobinQ_A	Acquirer Tobin's Q one year before the acquisition year. It is calculated as the ratio between the market value and the book value of assets.
FCF_A	Acquirer free cash flow one year before the acquisition measured as the difference between operating income before depreciation minus interest expense, tax expense, and dividends scaled by total assets.

B.4 Robustness tests

B.4.1 Sensitivity analysis to the choice of discount rate (Discount rate = 3%)

Dependent Variable: M&A termination dummy

	Model 1					Model 2					Model 3				
OBSL_T_Graham	0.070*	0.077**	0.072**	0.072**	0.065*										
	(0.037)	(0.036)	(0.037)	(0.037)	(0.037)										
OBSL_T_S&P						0.052*	0.052*	0.056**	0.053*	0.049*					
						(0.028)	(0.028)	(0.028)	(0.028)	(0.028)					
OBSL_T_Moodys											0.056**	0.059**	0.057**	0.057**	0.055**
											(0.028)	(0.028)	(0.028)	(0.028)	(0.028)
Opaque_T	0.202***	0.232***	0.204***	0.205***		0.203***	0.235***	0.261***	0.206***		0.203***	0.236***	0.206***	0.207***	
	(0.065)	(0.065)	(0.065)	(0.065)		(0.065)	(0.065)	(0.065)	(0.065)		(0.065)	(0.065)	(0.065)	(0.065)	
Ind_Related	-0.032**	-0.024	-0.034**	-0.034**	-0.033**	-0.033**	-0.024	-0.024	-0.034**	-0.033**	-0.033**	-0.025	-0.034**	-0.034**	-0.035**
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.016)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Hostile	0.586***	0.612***	0.585***	0.586***	0.585***	0.585***	0.611***	0.609***	0.585***	0.584***	0.585***	0.610***	0.584***	0.585***	0.583***
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.030)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)
Multibid	0.241***	0.261***	0.238***	0.238***	0.238***	0.241***	0.261***	0.259***	0.238***	0.238***	0.241***	0.261***	0.237***	0.238***	0.239***
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)
Tender Offer	-0.090***	-0.095***	-0.089***	-0.087***	-0.093***	-0.090***	-0.095***	-0.098***	-0.087***	-0.092***	-0.090***	-0.095***	-0.089***	-0.087***	-0.092***
	(0.020)	(0.020)	(0.019)	(0.019)	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)	(0.020)	(0.020)	(0.020)	(0.019)	(0.019)	(0.020)
All_cash	-0.022	-0.048**		0.008	-0.025	-0.023	-0.049**	-0.054***	0.008	-0.026	-0.023	-0.049**		0.008	-0.024
	(0.021)	(0.021)		(0.018)	(0.021)	(0.021)	(0.021)	(0.021)	(0.018)	(0.021)	(0.021)	(0.021)		(0.018)	(0.021)
All_shares	-0.045**	-0.029	-0.022		-0.043**	-0.045**	-0.028	-0.022		-0.044**	-0.045**	-0.028	-0.021		-0.046**
	(0.022)	(0.022)	(0.018)		(0.021)	(0.022)	(0.022)	(0.022)		(0.021)	(0.022)	(0.022)	(0.018)		(0.022)
Mixed	-0.064***	-0.062**			-0.064***	-0.064***	-0.063***	-0.066***		-0.065***	-0.064***	-0.063***			-0.065***
	(0.024)	(0.024)			(0.024)	(0.024)	(0.024)	(0.024)		(0.024)	(0.024)	(0.024)			(0.024)
Size_T	0.013**		0.011**	0.012**	0.011*	0.013**			0.011**	0.011*	0.012**		0.011*	0.011*	0.012**
	(0.006)		(0.006)	(0.006)	(0.006)	(0.006)			(0.006)	(0.006)	(0.006)		(0.006)	(0.006)	(0.006)
TobinQ_T	0.008	-0.002	0.008	0.007		0.008	-0.002	-0.003	0.007		0.008	-0.002	0.008	0.007	0.009*

	(0.006)	(0.005)	(0.006)	(0.006)		(0.006)	(0.005)	(0.005)	(0.006)		(0.006)	(0.005)	(0.006)	(0.006)	(0.006)
ROA_T	0.080**		0.083**	0.084**	0.069**	0.079**			0.083**	0.069**	0.078**		0.081**	0.082**	0.068**
	(0.033)		(0.033)	(0.033)	(0.033)	(0.033)			(0.033)	(0.033)	(0.033)		(0.033)	(0.033)	(0.033)
Leverage_T	0.007	-0.003	0.018	0.022	-0.006	0.007	-0.004	-0.002	0.022	-0.006	0.006	-0.004	0.017	0.021	0.006
	(0.035)	(0.035)	(0.034)	(0.034)	(0.034)	(0.035)	(0.035)	(0.035)	(0.034)	(0.034)	(0.035)	(0.035)	(0.034)	(0.034)	(0.035)
Size_A	-0.032***		-0.031***	-0.031***	-0.031***	-0.032***			-0.031***	-0.031***	-0.032***		-0.031***	-0.031***	-0.033***
	(0.005)		(0.005)	(0.005)	(0.005)	(0.005)			(0.005)	(0.005)	(0.005)		(0.005)	(0.005)	(0.005)
Leverage_A	0.026	-0.000	0.030	0.032	0.031	0.025	-0.002	0.001	0.031	0.030	0.025	-0.003	0.029	0.030	0.024
	(0.041)	(0.042)	(0.041)	(0.041)	(0.040)	(0.041)	(0.042)	(0.042)	(0.041)	(0.040)	(0.041)	(0.042)	(0.041)	(0.041)	(0.041)
TobinQ_A	-0.003	-0.001	-0.003	-0.003		-0.003	-0.001	-0.000	-0.003		-0.003	-0.001	-0.003	-0.003	-0.004
	(0.005)	(0.005)	(0.005)	(0.005)		(0.005)	(0.005)	(0.005)	(0.005)		(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
FCF_A	-0.104**	-0.163***	-0.110**	-0.107**	-0.111**	-0.104**	-0.164***		-0.107**	-0.111**	-0.104**	-0.165***	-0.110**	-0.107**	-0.110**
	(0.051)	(0.047)	(0.052)	(0.051)	(0.052)	(0.051)	(0.047)		(0.051)	(0.052)	(0.051)	(0.047)	(0.052)	(0.051)	(0.052)
_cons	0.276***	0.139***	0.253***	0.239***	0.310***	0.281***	0.142***	0.130***	0.244***	0.314***	0.282***	0.142***	0.259***	0.245***	0.314***
	(0.036)	(0.027)	(0.034)	(0.033)	(0.033)	(0.036)	(0.027)	(0.027)	(0.033)	(0.033)	(0.036)	(0.027)	(0.034)	(0.032)	(0.034)
Obs.	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711
R-squared	0.311	0.286	0.281	0.310	0.306	0.311	0.286	0.281	0.308	0.306	0.311	0.286	0.309	0.308	0.308

In this table, we test whether our findings remain robust if the discount rate used to calculate the target firm's off-balance sheet leasing commitments is set at 3%.The model dependent variable is a dummy variable that takes a value of one if the announced M&A deal is subsequently terminated and is zero otherwise. Target magnitude of off-balance sheet leasing is measured with three proxies. Model (1) reports the regression results where the target magnitude of off-balance sheet leasing is defined following Graham et al.'s (1998) capitalisation of future minimum lease payments (*OBSL_T_Graham*). In Model (2), the target magnitude of off-balance sheet leasing is defined following the S&P method (*OBSL_T_S&P*). In Model (3), target off-balance sheet leasing intensity is defined following Moody's methodology (*OBSL_T_Moodys*). Following Hutton et al. (2009), we define the variable *Opaque_T* as the target firm's three years moving sum of the absolute value of abnormal annual discretionary accruals. All variable definitions are provided in Appendix B.3. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

B.4.2 Sensitivity analysis to the choice of discount rate (Discount rate = 6%)

Dependent Variable: M&A termination dummy

	Model 1					Model 2					Model 3				
OBSL_T_Graham	0.073*	0.081**	0.076*	0.076**	0.069*										
	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)										
OBSL_T_S&P						0.059*	0.060*	0.064**	0.060*	0.055*					
						(0.031)	(0.031)	(0.031)	(0.031)	(0.031)					
OBSL_T_Moodys											0.063**	0.067**	0.064**	0.064**	0.076**
											(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
Opaque_T	0.202***	0.232***	0.204***	0.205***		0.203***	0.235***	0.261***	0.205***		0.203***	0.236***	0.206***	0.207***	
	(0.065)	(0.065)	(0.065)	(0.065)		(0.065)	(0.065)	(0.065)	(0.065)		(0.065)	(0.065)	(0.065)	(0.065)	
Ind_Related	-0.032**	-0.024	-0.034**	-0.034**	-0.033**	-0.033**	-0.024	-0.024	-0.034**	-0.033**	-0.033**	-0.025	-0.034**	-0.034**	-0.028*
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.016)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Hostile	0.586***	0.612***	0.585***	0.586***	0.585***	0.585***	0.611***	0.610***	0.584***	0.584***	0.585***	0.610***	0.584***	0.585***	0.603***
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.030)
Multibid	0.241***	0.261***	0.238***	0.238***	0.238***	0.241***	0.261***	0.259***	0.238***	0.238***	0.241***	0.261***	0.237***	0.238***	0.251***
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)
Tender Offer	-0.090***	-0.095***	-0.089***	-0.087***	-0.093***	-0.090***	-0.095***	-0.098***	-0.089***	-0.092***	-0.090***	-0.095***	-0.089***	-0.087***	-0.093***
	(0.020)	(0.020)	(0.019)	(0.019)	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)	(0.020)	(0.020)	(0.020)	(0.019)	(0.019)	(0.020)
All_cash	-0.022	-0.048**		0.008	-0.025	-0.023	-0.049**	-0.054***		-0.026	-0.023	-0.048**		0.008	-0.023
	(0.021)	(0.021)		(0.018)	(0.021)	(0.021)	(0.021)	(0.021)		(0.021)	(0.021)	(0.021)		(0.018)	(0.018)
All_shares	-0.045**	-0.029	-0.022		-0.043**	-0.045**	-0.028	-0.022	-0.022	-0.044**	-0.045**	-0.028	-0.021		0.000
	(0.022)	(0.022)	(0.018)		(0.021)	(0.022)	(0.022)	(0.022)	(0.018)	(0.021)	(0.022)	(0.022)	(0.018)		(0.019)
Mixed	-0.064***	-0.062**			-0.064***	-0.064***	-0.063***	-0.066***		-0.065***	-0.064***	-0.063**			
	(0.024)	(0.024)			(0.024)	(0.024)	(0.024)	(0.024)		(0.024)	(0.024)	(0.024)			
Size_T	0.013**		0.011**	0.012**	0.011*	0.013**			0.011*	0.011*	0.012**		0.011*	0.011*	
	(0.006)		(0.006)	(0.006)	(0.006)	(0.006)			(0.006)	(0.006)	(0.006)		(0.006)	(0.006)	
TobinQ_T	0.008	-0.002	0.008	0.007		0.008	-0.002	-0.003	0.008		0.008	-0.002	0.008	0.007	0.000
	(0.006)	(0.005)	(0.006)	(0.006)		(0.006)	(0.005)	(0.005)	(0.006)		(0.006)	(0.005)	(0.006)	(0.006)	(0.005)
ROA_T	0.080**		0.083**	0.084**	0.069**	0.079**			0.083**	0.069**	0.078**		0.081**	0.082**	0.076**

	(0.033)		(0.033)	(0.033)	(0.033)	(0.033)			(0.033)	(0.033)	(0.033)		(0.033)	(0.033)	(0.031)
Leverage_T	0.007	-0.003	0.018	0.022	-0.006	0.007	-0.004	-0.002	0.018	-0.006	0.006	-0.004	0.017	0.021	
	(0.035)	(0.035)	(0.034)	(0.034)	(0.034)	(0.035)	(0.035)	(0.035)	(0.034)	(0.034)	(0.035)	(0.035)	(0.034)	(0.034)	
Size_A	-0.032***		-0.031***	-0.031***	-0.031***	-0.032***			-0.031***	-0.031***	-0.032***		-0.031***	-0.031***	
	(0.005)		(0.005)	(0.005)	(0.005)	(0.005)			(0.005)	(0.005)	(0.005)		(0.005)	(0.005)	
Leverage_A	0.026	-0.000	0.030	0.032	0.031	0.025	-0.002	0.002	0.030	0.031	0.025	-0.002	0.029	0.031	-0.006
	(0.041)	(0.042)	(0.041)	(0.041)	(0.040)	(0.041)	(0.042)	(0.042)	(0.041)	(0.040)	(0.041)	(0.042)	(0.041)	(0.041)	(0.041)
TobinQ_A	-0.003	-0.001	-0.003	-0.003		-0.003	-0.001	-0.000	-0.003		-0.003	-0.001	-0.003	-0.003	-0.001
	(0.005)	(0.005)	(0.005)	(0.005)		(0.005)	(0.005)	(0.005)	(0.005)		(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
FCF_A	-0.104**	-0.162***	-0.110**	-0.107**	-0.111**	-0.104**	-0.164***		-0.110**	-0.111**	-0.104**	-0.165***	-0.110**	-0.107**	-0.230***
	(0.051)	(0.047)	(0.052)	(0.051)	(0.052)	(0.051)	(0.047)		(0.052)	(0.052)	(0.051)	(0.047)	(0.052)	(0.051)	(0.050)
_cons	0.276***	0.139***	0.253***	0.239***	0.310***	0.280***	0.141***	0.130***	0.257***	0.314***	0.281***	0.141***	0.258***	0.244***	0.138***
	(0.036)	(0.027)	(0.034)	(0.033)	(0.033)	(0.036)	(0.027)	(0.027)	(0.034)	(0.033)	(0.036)	(0.027)	(0.034)	(0.032)	(0.022)
Obs.	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711	1711
R-squared	0.311	0.286	0.308	0.308	0.306	0.311	0.286	0.281	0.308	0.306	0.311	0.287	0.309	0.308	0.281

In this table, we test whether our findings remain robust if the discount rate used to calculate the target firm's off-balance sheet leasing commitments is set at 6%. The model dependent variable is a dummy variable that takes a value of one if the announced M&A deal is subsequently terminated and is zero otherwise. Target magnitude of off-balance sheet leasing is measured with three proxies. Model (1) reports the regression results where the target magnitude of off-balance sheet leasing is defined following Graham et al.'s (1998) capitalisation of future minimum lease payments (*OBSL_T_Graham*). In Model (2), the target magnitude of off-balance sheet leasing is defined following the S&P method (*OBSL_T_S&P*). In Model (3), the target off-balance sheet leasing intensity is defined following Moody's methodology (*OBSL_T_Moodys*). Following Hutton et al. (2009), we define the variable *Opaque_T* as the target firm's three-years moving sum of the absolute value of abnormal annual discretionary accruals. All variable definitions are provided in Appendix B.3. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

B.4.3 Sensitivity analysis to the choice of discount rate (Discount rate = 3%)

Dependent Variable: post-acquisition performance

	Model 1					Model 2					Model 3				
OBSL_T_Graham	0.015	0.029**	0.042***	0.015	0.018										
	(0.014)	(0.014)	(0.015)	(0.013)	(0.014)										
OBSL_T_S&P						0.010	0.021*	0.030**	0.010	0.012					
						(0.011)	(0.012)	(0.013)	(0.011)	(0.011)					
OBSL_T_Moodys											0.011	0.023*	0.015	0.013	0.015
											(0.011)	(0.013)	(0.012)	(0.011)	(0.012)
Opaque_T	-0.044	-0.005	0.025	-0.045*	-0.046*	-0.044	-0.004	0.027	-0.045*	-0.045*	-0.044	0.030	-0.015	-0.045*	-0.015
	(0.027)	(0.027)	(0.030)	(0.027)	(0.027)	(0.027)	(0.027)	(0.030)	(0.027)	(0.027)	(0.027)	(0.030)	(0.028)	(0.027)	(0.028)
Ind_Related	0.004	0.005	0.006	0.004	0.003	0.004	0.005	0.006	0.004	0.003	0.004	0.006	0.006	0.003	0.006
	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)
Hostile	-0.020	-0.025	-0.025	-0.020	-0.019	-0.020	-0.026	-0.026	-0.020	-0.019	-0.020	-0.026	-0.020	-0.019	-0.020
	(0.018)	(0.018)	(0.020)	(0.018)	(0.018)	(0.018)	(0.018)	(0.020)	(0.018)	(0.018)	(0.018)	(0.020)	(0.018)	(0.018)	(0.018)
Multibid	-0.010	-0.012	-0.016	-0.010	-0.009	-0.010	-0.012	-0.016	-0.010	-0.009	-0.010	-0.016	-0.009	-0.009	-0.009
	(0.012)	(0.013)	(0.014)	(0.012)	(0.012)	(0.012)	(0.013)	(0.014)	(0.012)	(0.012)	(0.012)	(0.014)	(0.013)	(0.012)	(0.013)
Tender Offer	0.002	0.003	-0.001	0.001	0.002	0.002	0.003	-0.001	0.001	0.002	0.002	-0.001	0.003	0.002	0.003
	(0.006)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.006)	(0.007)
All_cash	0.003	0.007	0.001	0.003	0.004	0.003	0.007	0.001	0.003	0.004	0.003	0.000	0.002	0.004	0.004
	(0.007)	(0.007)	(0.008)	(0.006)	(0.007)	(0.007)	(0.007)	(0.008)	(0.006)	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)	(0.006)
All_shares	0.003	0.006	0.018**		-0.001	0.003	0.006	0.018**		-0.001	0.003	0.018**	0.000	-0.001	0.003
	(0.007)	(0.007)	(0.008)		(0.007)	(0.007)	(0.007)	(0.008)		(0.007)	(0.007)	(0.008)	(0.007)	(0.007)	(0.007)
Mixed	-0.005	-0.005	-0.006		-0.005	-0.005	-0.005	-0.006		-0.005	-0.005	-0.006	-0.004	-0.005	
	(0.008)	(0.008)	(0.009)		(0.008)	(0.008)	(0.008)	(0.009)		(0.008)	(0.008)	(0.009)	(0.008)	(0.008)	
Size_T	-0.000			-0.001	0.000	-0.000			-0.001	-0.000	-0.000		-0.005***	-0.000	-0.006***
	(0.002)			(0.002)	(0.002)	(0.002)			(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)
TobinQ_T	-0.003*	-0.002	-0.003	-0.003		-0.003*	-0.002	-0.003	-0.003		-0.003*	-0.003			
	(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)			
ROA_T	-0.088***			-0.088***	-0.084***	-0.088***			-0.088***	-0.085***	-0.088***			-0.085***	

	(0.011)			(0.011)	(0.011)	(0.011)			(0.011)	(0.011)	(0.011)			(0.011)	
Leverage_T	-0.006	-0.000	0.002	-0.006	0.001	-0.006	-0.001	0.001	-0.006	0.001	-0.007	0.001		0.001	0.010
	(0.011)	(0.012)	(0.013)	(0.011)	(0.011)	(0.011)	(0.012)	(0.013)	(0.011)	(0.011)	(0.011)	(0.013)		(0.011)	(0.011)
Size_A	0.000			0.000	-0.000	0.000			0.000	-0.000	0.000		0.002	-0.000	0.002
	(0.002)			(0.002)	(0.002)	(0.002)			(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)
Leverage_A	0.006	-0.001	0.003	0.006	0.014	0.006	-0.002	0.003	0.006	0.014	0.006	0.002	0.007	0.014	0.004
	(0.014)	(0.014)	(0.016)	(0.014)	(0.014)	(0.014)	(0.014)	(0.016)	(0.014)	(0.014)	(0.014)	(0.016)	(0.013)	(0.014)	(0.014)
TobinQ_A	-0.003*	-0.002	-0.003*	-0.003*		-0.003*	-0.002	-0.003*	-0.003*		-0.003*	-0.003*			
	(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)			
FCF_A	-0.224***	-0.277***		-0.225***	-0.228***	-0.224***	-0.277***		-0.225***	-0.228***	-0.224***		-0.278***	-0.228***	-0.277***
	(0.019)	(0.017)		(0.019)	(0.019)	(0.019)	(0.017)		(0.019)	(0.019)	(0.019)		(0.018)	(0.019)	(0.018)
_cons	0.020	0.010	-0.012	0.021*	0.010	0.021*	0.011	-0.011	0.022*	0.011	0.021*	-0.009	0.020	0.011	0.016
	(0.013)	(0.009)	(0.010)	(0.012)	(0.012)	(0.013)	(0.009)	(0.010)	(0.011)	(0.012)	(0.013)	(0.010)	(0.012)	(0.012)	(0.012)
Obs.	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356
R-squared	0.223	0.179	0.023	0.222	0.217	0.222	0.178	0.021	0.222	0.217	0.223	0.019	0.181	0.217	0.181

In this table, we test whether our findings remain robust if the discount rate used to calculate the target firm's off-balance sheet leasing commitments is set at 3%. The model dependent variable is the post-acquisition performance. Target magnitude of off-balance sheet leasing is measured with three proxies. Model (1) reports the regression results where the target magnitude of off-balance sheet leasing is defined following Graham et al.'s (1998) capitalisation of future minimum lease payments (*OBSL_T_Graham*). In Model (2), the target magnitude of off-balance sheet leasing is defined following the S&P method (*OBSL_T_S&P*). In Model (3), the target off-balance sheet leasing intensity is defined following Moody's methodology (*OBSL_T_Moodys*). Following Hutton et al. (2009), we define the variable *Opaque_T* as the target firm's three-years moving sum of the absolute value of abnormal annual discretionary accruals. All variable definitions are provided in Appendix B.3. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

B.4.4 Sensitivity analysis to the choice of discount rate (Discount rate = 6%)

Dependent Variable: post-acquisition performance

	Model 1					Model 2					Model 3				
OBSL_T_Graham	0.016	0.031**	0.045***	0.016	0.016										
	(0.014)	(0.014)	(0.016)	(0.014)	(0.014)										
OBSL_T_S&P						0.012	0.024*	0.035**	0.012	0.014					
						(0.013)	(0.013)	(0.014)	(0.013)	(0.013)					
OBSL_T_Moodys											0.013	0.027*	0.013	0.015	0.015
											(0.013)	(0.014)	(0.013)	(0.013)	(0.013)
Opaque_T	-0.044	-0.005	0.025	-0.045*	-0.045*	-0.044	-0.004	0.027	-0.045*	-0.045*	-0.044	0.029	-0.045*	-0.013	-0.045*
	(0.027)	(0.027)	(0.030)	(0.027)	(0.027)	(0.027)	(0.027)	(0.030)	(0.027)	(0.027)	(0.027)	(0.030)	(0.027)	(0.028)	(0.027)
Ind_Related	0.004	0.005	0.006	0.004	0.004	0.004	0.005	0.006	0.004	0.003	0.004	0.006	0.004	0.007	0.003
	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)
Hostile	-0.020	-0.025	-0.025	-0.020	-0.020	-0.020	-0.026	-0.025	-0.020	-0.019	-0.020	-0.026	-0.020	-0.021	-0.019
	(0.018)	(0.018)	(0.020)	(0.018)	(0.018)	(0.018)	(0.018)	(0.020)	(0.018)	(0.018)	(0.018)	(0.020)	(0.018)	(0.018)	(0.018)
Multibid	-0.010	-0.012	-0.016	-0.010	-0.010	-0.010	-0.012	-0.016	-0.010	-0.009	-0.010	-0.016	-0.010	-0.009	-0.009
	(0.012)	(0.013)	(0.014)	(0.012)	(0.012)	(0.012)	(0.013)	(0.014)	(0.012)	(0.012)	(0.012)	(0.014)	(0.012)	(0.013)	(0.012)
Tender Offer	0.002	0.003	-0.001	0.003	0.001	0.002	0.003	-0.001	0.001	0.002	0.002	-0.001	0.001	0.003	0.002
	(0.006)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.006)	(0.006)	(0.007)	(0.006)	(0.007)	(0.006)
All_cash	0.003	0.007	0.001		0.003	0.003	0.007	0.001	0.003	0.004	0.003	0.000	0.003	0.002	0.004
	(0.007)	(0.007)	(0.008)		(0.006)	(0.007)	(0.007)	(0.008)	(0.006)	(0.007)	(0.007)	(0.008)	(0.006)	(0.007)	(0.007)
All_shares	0.003	0.006	0.018**	0.003		0.003	0.006	0.018**		-0.001	0.003	0.018**		0.004	-0.001
	(0.007)	(0.007)	(0.008)	(0.006)		(0.007)	(0.007)	(0.008)		(0.007)	(0.007)	(0.008)		(0.007)	(0.007)
Mixed	-0.005	-0.005	-0.006			-0.005	-0.005	-0.006		-0.005	-0.005	-0.006		-0.003	-0.005
	(0.008)	(0.008)	(0.009)			(0.008)	(0.008)	(0.009)		(0.008)	(0.008)	(0.009)		(0.008)	(0.008)
Size_T	-0.000			-0.001	-0.001	-0.000			-0.001	-0.000	-0.000		-0.001	-0.006***	-0.000
	(0.002)			(0.002)	(0.002)	(0.002)			(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)
TobinQ_T	-0.003*	-0.002	-0.003	-0.003*	-0.003	-0.003*	-0.002	-0.003	-0.003		-0.003*	-0.003	-0.003	-0.003	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)	
ROA_T	-0.088***			-0.087***	-0.088***	-0.088***			-0.088***	-0.085***	-0.088***		-0.088***		-0.085***
	(0.011)			(0.011)	(0.011)	(0.011)			(0.011)	(0.011)	(0.011)		(0.011)		(0.011)
Leverage_T	-0.006	-0.000	0.002	-0.007	-0.006	-0.006	-0.001	0.001	-0.006	0.001	-0.007	0.001	-0.006		0.001
	(0.011)	(0.012)	(0.013)	(0.011)	(0.011)	(0.011)	(0.012)	(0.013)	(0.011)	(0.011)	(0.011)	(0.013)	(0.011)		(0.011)
Size_A	0.000			0.001	0.000	0.000			0.000	-0.000	0.000		0.000	0.003*	-0.000
	(0.002)			(0.002)	(0.002)	(0.002)			(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)
Leverage_A	0.006	-0.001	0.003	0.005	0.006	0.006	-0.002	0.003	0.006	0.014	0.006	0.002	0.006	-0.001	0.014
	(0.014)	(0.014)	(0.016)	(0.014)	(0.014)	(0.014)	(0.014)	(0.016)	(0.014)	(0.014)	(0.014)	(0.016)	(0.014)	(0.014)	(0.014)

TobinQ_A	-0.003*	-0.002	-0.003*	-0.003*	-0.003*	-0.003*	-0.002	-0.003*	-0.003*		-0.003*	-0.003*	-0.003*	-0.002		
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)		
FCF_A	-0.224***	-0.276***		-0.224***	-0.225***	-0.224***	-0.277***		-0.225***	-0.228***	-0.224***		-0.225***	-0.276***	-0.228***	
	(0.019)	(0.017)		(0.019)	(0.019)	(0.019)	(0.017)		(0.019)	(0.019)	(0.019)		(0.019)	(0.018)	(0.019)	
_cons	0.020	0.010	-0.012	0.020*	0.021*	0.021	0.011	-0.011	0.022*	0.011	0.021*	-0.010	0.022*	0.025**	0.011	
	(0.013)	(0.009)	(0.010)	(0.012)	(0.012)	(0.013)	(0.009)	(0.010)	(0.011)	(0.012)	(0.013)	(0.010)	(0.011)	(0.013)	(0.012)	
Obs.	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	1356	
R-squared	0.223	0.179	0.023	0.222	0.222	0.223	0.178	0.022	0.222	0.217	0.223	0.020	0.222	0.184	0.217	

In this table, we test whether our findings remain robust if the discount rate used to calculate target firms' off-balance sheet leasing commitments is set at 6%. The model dependent variable is the post-acquisition performance. Target magnitude of off-balance sheet leasing is measured with three proxies. Model (1) reports the regression results where the target magnitude of off-balance sheet leasing is defined following Graham et al.'s (1998) capitalisation of future minimum lease payments (*OBSL_T_Graham*). In Model (2), the target magnitude of off-balance sheet leasing is defined following the S&P method (*OBSL_T_S&P*). In Model (3), the target off-balance sheet leasing intensity is defined following Moody's methodology (*OBSL_T_Moodys*). Following Hutton et al. (2009), we define the variable *Opaque_T* as the target firm's three-years moving sum of the absolute value of abnormal annual discretionary accruals. All variable definitions are provided in Appendix B.3. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

B.4.5 Using discretionary revenues to account for target firms' accounting statements opacity (part one)

Dependent Variable: M&A termination dummy

	Model 1					Model 2					Model 3				
OBSL_T_Graham	0.108**	0.121**	0.134**	0.111**	0.111**										
	(0.054)	(0.053)	(0.054)	(0.055)	(0.055)										
OBSL_T_S&P						0.081*	0.089*	0.098**	0.083*	0.075*					
						(0.046)	(0.046)	(0.046)	(0.046)	(0.046)					
OBSL_T_Moodys											0.089*	0.101**	0.108**	0.090*	0.083*
											(0.047)	(0.047)	(0.048)	(0.047)	(0.047)
Opaque2_T	0.150**	0.213***	0.234***	0.153**	0.156**	0.154**	0.217***	0.239***	0.160**	0.165**	0.153**	0.215***	0.237***	0.156**	0.167**
	(0.076)	(0.077)	(0.077)	(0.076)	(0.076)	(0.076)	(0.076)	(0.077)	(0.076)	(0.075)	(0.076)	(0.076)	(0.077)	(0.076)	(0.076)
Ind_Related	-0.033**	-0.023	-0.024	-0.034**	-0.034**	-0.033**	-0.023	-0.024	-0.034**	-0.031**	-0.033**	-0.024	-0.024	-0.034**	-0.035**
	(0.015)	(0.016)	(0.016)	(0.015)	(0.015)	(0.015)	(0.016)	(0.016)	(0.015)	(0.015)	(0.015)	(0.016)	(0.016)	(0.015)	(0.015)
Hostile	0.586***	0.612***	0.611***	0.585***	0.586***	0.586***	0.612***	0.611***	0.586***	0.587***	0.586***	0.612***	0.611***	0.586***	0.586***
	(0.029)	(0.029)	(0.030)	(0.029)	(0.029)	(0.029)	(0.029)	(0.030)	(0.029)	(0.029)	(0.029)	(0.029)	(0.030)	(0.029)	(0.029)
Multibid	0.242***	0.261***	0.258***	0.238***	0.238***	0.242***	0.261***	0.258***	0.239***	0.241***	0.242***	0.261***	0.257***	0.238***	0.242***
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)
Tender Offer	-0.092***	-0.096***	-0.100***	-0.089***	-0.088***	-0.092***	-0.096***	-0.100***	-0.088***	-0.092***	-0.092***	-0.096***	-0.100***	-0.090***	-0.093***
	(0.020)	(0.020)	(0.020)	(0.019)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)	(0.020)
All_cash	-0.021	-0.046**	-0.052**		0.010	-0.021	-0.046**	-0.052**	0.010	-0.023	-0.021	-0.046**	-0.052**		-0.019
	(0.021)	(0.021)	(0.021)		(0.018)	(0.021)	(0.021)	(0.021)	(0.018)	(0.021)	(0.021)	(0.021)	(0.021)		(0.021)
All_shares	-0.044**	-0.026	-0.020	-0.021		-0.044**	-0.026	-0.020		-0.042*	-0.044**	-0.025	-0.019	-0.021	-0.044**
	(0.022)	(0.022)	(0.022)	(0.018)		(0.022)	(0.022)	(0.022)		(0.021)	(0.022)	(0.022)	(0.022)	(0.018)	(0.021)
Mixed	-0.064***	-0.062**	-0.065***			-0.065***	-0.063**	-0.066***		-0.064***	-0.064***	-0.063**	-0.066***		-0.065***
	(0.024)	(0.024)	(0.025)			(0.024)	(0.024)	(0.025)		(0.024)	(0.024)	(0.024)	(0.025)		(0.024)
Size_T	0.014**			0.012**	0.013**	0.014**			0.012**	0.012**	0.013**			0.011**	0.017***
	(0.006)			(0.006)	(0.006)	(0.006)			(0.006)	(0.006)	(0.006)			(0.006)	(0.005)
TobinQ_T	0.008	-0.002	-0.003	0.008	0.008	0.008	-0.002	-0.003	0.007		0.008	-0.002	-0.003	0.008	0.008
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)		(0.006)	(0.006)	(0.006)	(0.006)	(0.005)

ROA_T	0.061*			0.065*	0.065*	0.060*			0.064*	0.059*	0.058*			0.061*	
	(0.033)			(0.033)	(0.033)	(0.033)			(0.033)	(0.033)	(0.033)			(0.033)	
Leverage_T	-0.004	-0.013	-0.011	0.006	0.010	-0.004	-0.014	-0.012	0.010	-0.014	-0.004	-0.015	-0.013	0.006	
	(0.035)	(0.035)	(0.035)	(0.034)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.034)	(0.035)	(0.035)	(0.035)	(0.034)	
Size_A	-0.033***			-0.032***	-0.032***	-0.033***			-0.032***	-0.031***	-0.033***			-0.032***	-0.034***
	(0.005)			(0.005)	(0.005)	(0.005)			(0.005)	(0.005)	(0.005)			(0.005)	(0.005)
Leverage_A	0.028	0.001	0.004	0.033	0.035	0.028	-0.000	0.003	0.034	0.035	0.028	-0.001	0.002	0.032	0.030
	(0.042)	(0.042)	(0.042)	(0.041)	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)	(0.040)	(0.042)	(0.042)	(0.042)	(0.041)	(0.040)
TobinQ_A	-0.004	-0.001	-0.001	-0.004	-0.004	-0.004	-0.001	-0.001	-0.004		-0.004	-0.001	-0.001	-0.004	-0.004
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)		(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
FCF_A	-0.105**	-0.174***		-0.111**	-0.109**	-0.105**	-0.176***		-0.109**	-0.106**	-0.105**	-0.178***		-0.111**	-0.073
	(0.052)	(0.048)		(0.052)	(0.052)	(0.052)	(0.048)		(0.052)	(0.052)	(0.052)	(0.048)		(0.052)	(0.049)
_cons	0.289***	0.150***	0.139***	0.267***	0.252***	0.294***	0.154***	0.142***	0.258***	0.294***	0.295***	0.153***	0.142***	0.273***	0.289***
	(0.036)	(0.027)	(0.027)	(0.034)	(0.033)	(0.036)	(0.027)	(0.027)	(0.032)	(0.034)	(0.035)	(0.027)	(0.026)	(0.033)	(0.035)
Obs.	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701
R-squared	0.311	0.286	0.281	0.308	0.307	0.310	0.286	0.280	0.307	0.309	0.310	0.286	0.280	0.308	0.309

In this table, we repeat our main analysis using an alternative accrual-based proxy to account for the target accounting statement opacity. Following McNichols and Stubben (2008) and Stubben (2010), we define the variable *Opaque2_T* as the absolute value of the discretionary revenues observed one year before the M&A announcement. Higher values of the variable *Opaque2_T* signal greater accounting "window dressing" of the target accounting statements in the year prior to the acquisition. The model dependent variable is a dummy variable that takes a value of one if the announced M&A deal is subsequently terminated and is zero otherwise. Target magnitude of off-balance sheet leasing is measured with three proxies. Model (1) reports the regression results where the target magnitude of off-balance sheet leasing is defined following Graham et al.'s (1998) capitalisation of future minimum lease payments *(OBSL_T_Graham*). In Model (2), the target magnitude of off-balance sheet leasing is defined following the S&P method (*OBSL_T_S&P*). In Model (3), the target off-balance sheet leasing intensity is defined following Moody's methodology (*OBSL_T_Moodys*). All variable definitions are provided in Appendix B.3. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

B.4.6 Using discretionary revenues to account for target firms' accounting statements opacity (part two)

Dependent Variable: Post Acquisition performance

	Model 1					Model 2					Model 3				
OBSL_T_Graham	0.026	0.051***	0.080***	0.044**	0.044**										
	(0.019)	(0.018)	(0.020)	(0.019)	(0.019)										
OBSL_T_S&P						0.020	0.039**	0.060***	0.034**	0.034**					
						(0.016)	(0.016)	(0.017)	(0.016)	(0.016)					
OBSL_T_Moodys											0.020	0.032**	0.050***	0.030*	0.030*
											(0.016)	(0.016)	(0.018)	(0.016)	(0.016)
Opaque2_T	-0.013	-0.058	-0.088	-0.072	-0.071	-0.011	-0.053	-0.080	-0.069	-0.068	-0.011	-0.050	-0.075	-0.068	-0.067
	(0.049)	(0.050)	(0.054)	(0.049)	(0.049)	(0.049)	(0.050)	(0.054)	(0.049)	(0.049)	(0.049)	(0.050)	(0.054)	(0.049)	(0.049)
Ind_Related	0.006	0.006	0.006	0.007	0.007	0.006	0.006	0.006	0.007	0.007	0.006	0.006	0.006	0.007	0.007
	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)
Hostile	-0.019	-0.025	-0.025	-0.020	-0.020	-0.019	-0.025	-0.026	-0.020	-0.020	-0.019	-0.026	-0.026	-0.020	-0.020
	(0.018)	(0.018)	(0.020)	(0.018)	(0.018)	(0.018)	(0.018)	(0.020)	(0.018)	(0.018)	(0.018)	(0.018)	(0.020)	(0.018)	(0.018)
Multibid	-0.010	-0.013	-0.018	-0.010	-0.010	-0.010	-0.012	-0.018	-0.009	-0.010	-0.010	-0.012	-0.018	-0.009	-0.009
	(0.012)	(0.013)	(0.014)	(0.013)	(0.012)	(0.012)	(0.013)	(0.014)	(0.013)	(0.012)	(0.012)	(0.013)	(0.014)	(0.013)	(0.012)
Tender Offer	0.003	0.004	-0.001	0.004	0.004	0.003	0.004	-0.001	0.004	0.004	0.003	0.004	-0.001	0.003	0.004
	(0.006)	(0.007)	(0.007)	(0.007)	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)
All_cash	0.003	0.007	0.000	0.003	0.004	0.003	0.007	0.000	0.003	0.004	0.003	0.007	0.000	0.003	0.004
	(0.007)	(0.007)	(0.008)	(0.007)	(0.006)	(0.007)	(0.007)	(0.008)	(0.007)	(0.006)	(0.007)	(0.007)	(0.008)	(0.007)	(0.006)
All_shares	0.005	0.007	0.018**	0.003	0.004	0.005	0.007	0.018**	0.003	0.004	0.005	0.007	0.019**	0.003	0.004
	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)
Mixed	-0.004	-0.004	-0.005	-0.002		-0.004	-0.004	-0.005	-0.002		-0.004	-0.004	-0.005	-0.002	
	(0.008)	(0.008)	(0.009)	(0.008)		(0.008)	(0.008)	(0.009)	(0.008)		(0.008)	(0.008)	(0.009)	(0.008)	
Size_T	-0.000			-0.005***	-0.005***	-0.001			-0.005***	-0.005***	-0.001			-0.005***	-0.005***
	(0.002)			(0.002)	(0.002)	(0.002)			(0.002)	(0.002)	(0.002)			(0.002)	(0.002)
TobinQ_T	-0.003*	-0.002	-0.002			-0.003*	-0.002	-0.002			-0.003*	-0.002	-0.002		
	(0.002)	(0.002)	(0.002)			(0.002)	(0.002)	(0.002)			(0.002)	(0.002)	(0.002)		
ROA_T	-0.077***					-0.078***					-0.078***				

	(0.011)					(0.011)					(0.011)				
Leverage_T	-0.011	-0.007	-0.004		0.003	-0.011	-0.008	-0.005		0.003	-0.011	-0.008	-0.005		0.003
	(0.011)	(0.011)	(0.013)		(0.011)	(0.011)	(0.011)	(0.013)		(0.011)	(0.011)	(0.012)	(0.013)		(0.011)
Size_A	0.001			0.002	0.002	0.001			0.002	0.002	0.001			0.002	0.002
	(0.002)			(0.002)	(0.002)	(0.002)			(0.002)	(0.002)	(0.002)			(0.002)	(0.002)
Leverage_A	0.008	0.003	0.007	0.009	0.008	0.008	0.003	0.007	0.008	0.008	0.008	0.002	0.006	0.008	0.007
	(0.014)	(0.014)	(0.016)	(0.013)	(0.014)	(0.014)	(0.014)	(0.016)	(0.013)	(0.014)	(0.014)	(0.014)	(0.016)	(0.013)	(0.014)
TobinQ_A	-0.003*	-0.002	-0.003*			-0.003*	-0.002	-0.003*			-0.003*	-0.002	-0.003*		
	(0.002)	(0.002)	(0.002)			(0.002)	(0.002)	(0.002)			(0.002)	(0.002)	(0.002)		
FCF_A	-0.235***	-0.281***		-0.282***	-0.282***	-0.236***	-0.282***		-0.282***	-0.282***	-0.235***	-0.283***		-0.283***	-0.283***
	(0.019)	(0.017)		(0.018)	(0.018)	(0.019)	(0.017)		(0.018)	(0.018)	(0.019)	(0.017)		(0.018)	(0.018)
_cons	0.011	0.009	-0.010	0.011	0.010	0.012	0.010	-0.009	0.013	0.012	0.013	0.011	-0.007	0.015	0.014
	(0.013)	(0.009)	(0.010)	(0.012)	(0.012)	(0.013)	(0.009)	(0.010)	(0.012)	(0.012)	(0.012)	(0.009)	(0.010)	(0.012)	(0.012)
Obs.	1348	1348	1348	1348	1348	1348	1348	1348	1348	1348	1348	1348	1348	1348	1348
R-squared	0.222	0.188	0.029	0.190	0.190	0.221	0.187	0.026	0.189	0.189	0.221	0.185	0.023	0.189	0.189

In this table, we repeat our main analysis using an alternative accrual-based proxy to account for the target accounting statement opacity. Following McNichols and Stubben (2008) and Stubben (2010), we define the variable *Opaque2_T* as the absolute value of discretionary revenues observed one year before the M&A announcement. Higher values of the variable *Opaque2_T* signal greater accounting "window dressing" of the target accounting statements in the year prior to the acquisition. The model dependent variable is the post-acquisition performance. Target magnitude of off-balance sheet leasing is measured with three proxies. Model (1) reports the regression results where the target magnitude of off-balance sheet leasing is defined following Graham et al.'s (1998) capitalisation of future minimum lease payments *(OBSL_T_Graham*). In Model (2), the target magnitude of off-balance sheet leasing is defined following the S&P method (*OBSL_T_S&P*). In Model (3), the target off-balance sheet leasing intensity is defined following Moody's methodology (*OBSL_T_Moodys*). All variable definitions are provided in Appendix B.3. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level.

Appendix C

Financial covenants definitions

	DealScan financial covenant name	DealScan financial covenant definition	Compustat codes implementation
Balance-sheet based covenants	Max. Leverage	Total debt/total assets	(DLTT+DLC)/AT
	Max. Senior Leverage	Senior debt/total assets	(DLTT+DLC-DS)/AT
	Max. Debt to Tangible Net Worth	Total debt/(total assets - intangible assets - total liabilities)	(DLTT+DLC)/(AT-INTAN-LT)
	Max. Debt to Equity	Total debt/(total assets-total liabilities)	(DLTT+DLC)/(AT-LT)
	Min. Current Assets	Current assets/current liabilities	ACT/LCT
	Min. Quick Ratio	(receivables + cash and equivalents)/current liabilities	(RECT+CHE)/LCT
Income-statement based covenants	Min. Interest Coverage	EBITDA/interest expense	OIBDP/XINT
	Min. Cash Interest Coverage	EBITDA/interest paid	OIBDP/INTPN
	Min. Fixed Charge Coverage	EBITDA/(interest expense + principal + rent expense)	OIBDP/(XINT+lag_DLC+XRENT)
	Min Debt Service Coverage	EBITDA/(interest expense + principal)	OIBDP/(XINT+lag_DLC)
	Max. Debt to EBITDA	Debt/EBITDA	(DLTT+DLC)/OIBDP
	Max. Senior Debt to EBITDA	Senior debt/EBITDA	(DLTT+DLC-DS)/OIBDP

Notes: This table details definitions and formulas applied to estimate borrowing firms' reported financial covenants. In accordance with Demerjian (2011), we categorise financial covenants into balance-sheet based covenants and income-statement based covenants. In addition, to calculate reported financial covenants, we follow the Compustat implementation suggested by Demerjian and Owens (2016).

Variable Definitions

BSCOV*close*	A dummy variable that takes a value of one if the firm-year observation has at least one balance-sheet based covenant close to violation and zero otherwise. Following Franz et al. (2014), we categorise a loan contract as close to violation when the reported value of the borrowing company's financial ratio is within 15 % of its threshold value indicated in the loan contract. We follow Demerjian's (2011) classification of balance-sheet based financial covenants.

ISCOV*close*	A dummy variable that takes a value of one if the firm-year observation has at least one income-statement based covenant close to violation and zero otherwise. Following Franz et al. (2014), we categorise a loan contract as close to violation when the reported value of the borrowing company financial ratio is within 15 % of its threshold value indicated in the loan contract. We follow Demerjian's (2011) classification of income-statement based financial covenants.
High_OBSL	A dummy variable that takes a value of one if a firm belongs to an industry in the highest quartile distribution of the present value of OBS lease and zero otherwise.
VR	Following Demerjian (2011), we define Volatility ratio=book value volatility/adjusted net income volatility.
Leverage	Long-term Debt/Market Value of Total Assets.
Size	Ln(Market Capitalisation).
MTB	Market-to-Book Ratio.
ROA	Return on Assets.
Loss	A dummy variable that takes a value of one if the borrowing firm reports a loss (negative net income) for a year *t* and zero otherwise.
Advert_expense	Advertising Expense/Total Revenue.
RD_expense	Research and Development Expense/Total Revenue.
Tangibility	Net value of Property, Plant, and Equipment/Total Assets.
Zscore	Altman's credit risk score.
Div_dummy	A dummy variable that takes a value of one if the borrowing firm pays dividends during a year *t* and zero otherwise.
Loan_Size	Ln(loan amount)
Dividend_restriction	A dummy variable that a value of one if the loan contract indicates a dividend pay-out restriction and zero otherwise.
Maturity	Loan maturity.
Secured	A dummy variable that takes a value of one if the loan is secured and zero otherwise.

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