Can accounting facilitate lease financing?*

Jordan Schoenfeld
University of Utah

January 2022

Abstract

This study provides some of the first evidence on the direct role played by accounting in lease financing, which as a source of corporate financing rivals lending in terms of economic significance. Using a novel dataset of U.S. commercial real estate lease contracts, I find that these contracts often specify lease rates in which retail tenants pay a percentage of their monthly sales in rent, rather than a fixed amount. The adoption of this type of lease is significantly linked to lower tenant default rates and landlord-tenant risk-sharing motives, such as asymmetric information. Taken together, these findings support the longstanding conjecture that accounting facilitates contracting between firms and capital providers.

Keywords: corporate finance, financial contracting, leasing, real estate

*Corresponding author: Jordan Schoenfeld, University of Utah, Salt Lake City, UT 84112; e-mail: jordan.schoenfeld@eccles.utah.edu; tel: (440) 759-2506.

Can accounting facilitate lease financing?

Abstract

This study provides some of the first evidence on the direct role played by accounting in lease financing, which as a source of corporate financing rivals lending in terms of economic significance. Using a novel dataset of U.S. commercial real estate lease contracts, I find that these contracts often specify lease rates in which retail tenants pay a percentage of their monthly sales in rent, rather than a fixed amount. The adoption of this type of lease is significantly linked to lower tenant default rates and landlord-tenant risk-sharing motives, such as asymmetric information. Taken together, these findings support the longstanding conjecture that accounting facilitates contracting between firms and capital providers.

Keywords: corporate finance, financial contracting, leasing, real estate

1 Introduction

A longstanding conjecture in the accounting and finance literature is that accounting facilitates contracting between firms and capital providers (e.g., Watts and Zimmerman, 1990). While prior research extensively addresses the question of how debt financing and accounting are related (e.g., Smith and Warner, 1979), limited research exists on how lease financing and accounting are related. This is surprising because as a source of corporate financing, leasing rivals lending in terms of economic significance (Eisfeldt and Rampini, 2008). To this end, this study uses a novel dataset of lease contracts to answer the related questions of whether accounting plays a direct role in lease financing, whether this role is economically significant, what determines the use of accounting-based lease provisions, and whether accounting-based provisions are associated with lease outcomes. I focus my attention on commercial real estate leases because real estate is the most commonly leased asset by firms and largest asset class worldwide (Goetzmann et al., 2021).

Property ownership gives commercial landlords the control rights to negotiate lease contracts with tenants. An understudied practice is that these landlords routinely share in the risk of tenants' businesses by way of writing lease contracts that require tenants to submit their monthly income statements to landlords and pay a percentage of sales in rent, rather than a fixed amount (Poleg, 2021). Hence, accounting appears to play an important function in this class of financing. Property rights theory predicts that the use of such contingent payments involves a trade-off between the benefits of risk sharing and the costs of producing a contractible signal ex post (e.g., Shavell, 1979). Theory also predicts that these types of contracts are likely the result of negotiations whose outcomes depend on the parties' domain knowledge, risk tolerance, and agency problems arising from misaligned motives and asymmetric information (e.g., Grossman and Hart, 1986). I therefore use this framework to develop theory-based empirical predictions to test the arguments above.

With contract negotiations being unobservable on a large scale, determining the role played by accounting in lease contracts by directly measuring the benefits and costs of the

contracting parties is infeasible. Therefore, I follow prior research on financial contracts that takes the contracts as given and uses the variation in the adoption rates of specific contract provisions to indirectly estimate the economic motives of the contracting parties. This is the well-established revealed preference approach in economics (Samuelson, 1948) taken by Akins et al. (2020, Tables II to V), Christensen and Nikolaev (2012, Tables 3, 5, 7), and Nini et al. (2009, Tables 2 to 5), all of whom empirically model the adoption of the different covenants in debt contracts. Additionally, Acheson et al. (2019, Tables 5 to 8) and Schoenfeld (2020, Table 2) empirically model the adoption of shareholder contracts, and Core et al. (1999, Table 2) empirically model the determinants of the wage amounts in executive compensation contracts. Analogously, lease contracts—having have not received comparable research attention—require this approach as well.

I assemble a large-scale sample of lease contracts using CompStak, a commercial real estate analytics platform. CompStak was established in 2012 to serve real estate brokers, landlords, and investors, and maintains one of the most comprehensive databases on commercial real estate leases. The sample of interest is all leases in CompStak in the US from 2012 to 2020, or about 535,402 leases. Section 3 provides more detail on CompStak and compares the dataset to other leasing datasets used in the accounting and finance literature, such as the PayNet data used by Darmouni and Sutherland (2020), Doblas-Madrid and Minetti (2013), and Sutherland (2018). In brief, while PayNet focuses mainly on business leases of durable goods such as machines, CompStak focuses on business leases of real estate.

I next summarize the main findings. The first key result is that I observe two main types of lease contracts in my setting: fixed payment and contingent payment. *Fixed-payment* lease contracts specify an exact monthly lease payment the tenant pays to the landlord. In contrast, *contingent-payment* lease contracts specify a lease payment stated in terms of a percentage of the tenant's sales for the month; these contracts are therefore explicitly linked to the tenant's accounting outcomes (see Appendix A for an example). Contingent-payment leases are also concentrated in the sample of leases between landlords and retail

tenants, which is not surprising given that these contracts depend on the amount of store sales. Of the 107,926 retail leases in the sample, about 27 percent or 29,140 of these are contingent-payment lease contracts, representing an economically large $24 billion in total lease payments over the sample period. This is some of the first evidence that a lessee's accounting information plays a pervasive and important role in the design of lease contracts.

The second set of results examines the benefits and costs of contingent-payment leases based on their cross-sectional adoption patterns. Specifically, one of the strongest results is that the benefits of contingent-payment leases appear to be the greatest when landlord-tenant information asymmetry is relatively low, as measured by financial statement audits (e.g., Allee and Yohn, 2009; Minnis, 2011) and geographic separation between the leased property and the landlord's headquarters (e.g., Costello, 2013; Mian, 2006; Sufi, 2007; Vashishtha, 2014). This finding is consistent with Roberts (2015) and Sufi (2007), who find that firms' information environments can affect the design of loan contracts. Emerging businesses also appear to benefit from these leases, perhaps because these leases reduce fixed costs. In addition, the adoption of contingent-payment leases is significantly associated with the lease's duration and fixed price per square foot, the tenant's total number of establishments, the square footage of the leased property, tenant-specific property improvements, the size of the landlord's real estate portfolio, and whether the property is financed or owned outright by the landlord. Section 2 interprets all these effects in light of prior theoretical and empirical research. In brief, these findings suggest that landlords' and tenants' reputations, sophistication, risk tolerance, and concerns about misaligned motives all play an important role in the choice to write contingent-payment leases.

The third analysis examines the association between the choice to adopt a contingent-payment lease and tenant default rates, where default is defined in the data as any incidence of a lease payment being delinquent by 30 days or more over the lease. Such delinquencies likely imply cash flows below what was expected, entail more extensive monitoring of the tenants, and require action to pursue the delinquent payments. There are a few potential

channels through which contingent-payment leases may be associated with tenant default. First, contingent-payment leases may simply be riskier leases. Second, contingent-payment leases may represent leases for which landlords are competing to establish long-term relationships with tenants, in which case landlords may tolerate delinquencies in the short run. Bharath et al. (2009) and Petersen and Rajan (1994) argue that such effects occur in the lending markets. Third, contingent-payment leases may play an efficiency enhancing role in contracting and improve contract outcomes, in line with the longstanding proposition that accounting facilitates efficient contracting between firms and capital providers (e.g., Kurlat, 2016; Stroebel, 2016; Watts and Zimmerman, 1990). Theory is therefore ambiguous as to whether contingent-payment leases will be associated with the likelihood of tenant default. To investigate this issue, I build an empirical model of tenant default and the choice to adopt a contingent-payment lease, and find that the likelihood of tenant default is significantly lower for contingent-payment leases relative to fixed-payment leases. Although this finding is purely descriptive in nature, one interpretation is that the ability to contract on accounting outcomes may improve lease quality.

Understanding the anatomy of financial contracts is important for all contract research. This study contributes to the broader literature on the role played by accounting in explicit financial contracts. I provide some of the first systematic evidence that lease financing, and also the legal rights to real estate, can derive from contracts stated in terms of accounting information. This finding provides new and important empirical support for the longstanding proposition that accounting facilitates corporate financing and the allocation of property rights between related entities (e.g., Watts and Zimmerman, 1978, 1990). Unlike commercial real estate lease contracts, there is a large literature on other contracts that are commonly stated in terms of accounting information, including debt contracts, shareholder contracts, and executive compensation contracts.[1] However, the economics of leasing and commercial

[1]For surveys of these literatures, see Armstrong et al. (2010), Bushman and Smith (2001), Christensen et al. (2016), Holthausen and Leftwich (1983), Holthausen and Watts (2001), Kothari et al. (2010), Lambert (2001), Murphy (1999), Prendergast (1999), and Roberts and Sufi (2009b).

real estate are substantively different from these other settings, as the evidence demonstrates. Accounting thus appears to play a more important role in corporate financing than currently thought.

With regard to the literature on leasing, much of this research focuses on the tax incentives for leasing, lease valuation, and management's choices in financing mechanisms and accounting for leases.[2] In related studies, Darmouni and Sutherland (2020), Doblas-Madrid and Minetti (2013), and Sutherland (2018) analyze a mix of loan and lease contracts using PayNet data, which focuses almost exclusively on non-real-estate assets, such as manufacturing equipment (Sutherland, 2018, Table 1). However, none of these studies identifies accounting-based contingencies in their lease contracts. Beatty et al. (2010, Section V) and Eisfeldt and Rampini (2008, Section 3.3) take a different approach to determine the existence of leases, namely by measuring the value of lease-related items on firms' balance sheets and income statements. These studies, unlike the current study, are not able to determine whether leases have accounting-based contingencies.

This study also contributes to the broader literature on real estate. Garmaise and Moskowitz (2004), Kurlat and Stroebel (2015), Piazzesi et al. (2020), and Stroebel and Vavra (2019) find that the extent of asymmetric information between buyers and sellers is associated with various attributes of real estate purchases. In the residential mortgage market, Bailey et al. (2019), Mian and Sufi (2017), and Stroebel (2016) find that lending outcomes vary according to lender and buyer sophistication, and Loutskina and Strahan (2011) study the effects of lender diversification. Levitt and Syverson (2008) find that realtors' incentives are often not aligned with those of their clients. In the corporate lending market, Minnis and Sutherland (2017) and Lisowsky and Minnis (2020) find that when borrowers

[2]For example, see Ang and Peterson (1984), Beatty et al. (2010), Benmelech et al. (2016), Christie and Zimmerman (1994), Eisfeldt and Rampini (2006, 2008), El-Gazzar et al. (1986), Franks and Hodges (1978), Gavazza (2011), Gilligan (2004), Graham et al. (1998), Grenadier (1995), Imhoff and Thomas (1988), Lewellen et al. (1976), McConnell and Schallheim (1983), Murfin and Pratt (2019), Myers et al. (1976), Schallheim et al. (1987), Sharpe and Nguyen (1995), Smith and Wakeman (1985), Smith and Watts (1992), Wilkins and Zimmer (1983), and Vatter (1966). For surveys of this literature, see Fields et al. (2001), Graham and Leary (2011), Myers (2001), and Roychowdhury et al. (2019).

pledge real estate as collateral on a loan, lenders monitor borrowers less. In contrast, this study provides evidence on the economics of leasing real estate, which is a fundamentally different phenomenon and business decision than purchasing real estate.[3]

The remainder of this study is organized as follows. Section 2 motivates the hypotheses. Section 3 describes the data. Section 4 provides the empirical results. Section 6 concludes.

2 Theory, related literature, and empirical predictions

This section develops several theory-based hypotheses that are testable in the data based largely on agency and property rights frameworks, such as Grossman and Hart (1986), Hart (1995), and Holmström (1979). These studies make a strong case that contracts specifying property rights are typically the result of negotiations whose outcomes depend on the parties' domain knowledge, sophistication, risk tolerance, wealth, and agency problems arising from misaligned motives and asymmetric information (e.g., hold-up concerns). In the specific case of contracts specifying outcome-contingent payments, Shavell (1979, Section 1) further predicts that entities will trade off the benefits of such risk sharing with the costs of producing a reliable and verifiable signal ex post regarding the outcome. In the absence of such a signal, outcome-contingent payments may introduce costly noise or invite managerial gaming. These frameworks therefore fit the institutional profile of contingent-payment leases.

To investigate the benefits and costs of writing contingent-payment leases, I start by conducting a reduced-form empirical analysis guided by the above theoretical framework. This analysis looks at the adoption of contingent-payment leases based on important landlord attributes, tenant attributes, and proxies for risk-sharing motives and agency problems between landlords and tenants. Put differently, it asks when landlords and tenants will write contingent-payment leases rather than fixed-payment leases. This revealed-preference approach (Samuelson, 1948) is common in other contracting literatures, such as debt con-

[3]Several studies in the operations and industrial organization literatures also examine how leases may influence store configurations, but these studies do not analyze the role played by accounting information in lease contracts (e.g., Brueckner, 1993; Guven et al., 2019; Lee, 1995).

tracts, supplier contracts, and executive compensation contracts, where researchers take the contract as given and study the adoption rates and nature of specific contract provisions. For example, Akins et al. (2020, Tables II to V), Christensen and Nikolaev (2012, Tables 3, 5, 7), and Nini et al. (2009, Tables 2 to 5) empirically model the prevalence of the different types of covenants in debt contracts; Acheson et al. (2019, Tables 5 to 8) and Schoenfeld (2020, Table 2) empirically model the adoption of shareholder contracts; Core et al. (1999, Table 2) empirically model the determinants of executive compensation; and Costello (2013, Tables 3 to 6) empirically models the duration of supplier contracts.

I first test for any difference in the adoption of contingent-payment leases across industrial, office, and retail leases. With these lease contracts requiring a contractible ex post signal of sales made at the tenant's property, it may be relatively costly o less beneficial for landlords to write these contracts with industrial and office tenants, relative to retail tenants whose store sales may be more apparent. On the other hand, the complexity and innumerable unforeseen contingencies associated with contingent-payment leases may make it prohibitively costly for even the most sophisticated landlords and tenants to write contingent-payment leases (e.g., Grossman and Hart, 1986). Therefore, it is not clear theoretically how contingent-payment lease adoption will materialize in practice. If the benefits of contingent-payment leases are not tilted toward certain classes of landlords and tenants, there may be no systematic patterns in their adoption rates. Economic magnitudes are also not possible to determine ex ante, and understanding the adoption rates of contingent-payment leases can give insight into their economic significance and purpose. These incomplete contracting considerations lead to my first hypothesis, stated in the null:

Hypothesis 1: *Contingent-payment lease adoption is not significantly different across industrial tenants, office tenants, and retail tenants.*

I next examine how the adoption of contingent-payment leases compares to other attributes of the lease contract, starting with the duration of a lease. Various empirical associations have been documented between the duration of other financial contracts and their

overall structure. For example, Costello (2013) and Sutherland (2018) find that in supplier and lending contracts, contract duration is in part a function of the quality of the information environment between those party to the contract, as predicted by theory.[4] The lease contracts in my setting also have duration structures that may be associated with their overall design. Leases with longer durations can exacerbate any conflicts of interest, prevent tenants from taking advantage of subsequent declines in lease rates, increase tenants' liabilities, and increase the cost of relocating due to adverse local market conditions. In contrast, longer leases may reduce uncertainty for both landlords and tenants regarding the future payments on a lease. Also, longer leases mean that landlords can be less concerned with lease renewals or locating new tenants, assuming tenants do not systematically go into default.

Duration may also play a screening role for landlords, whereby tenants of higher quality select into shorter duration leases (e.g., Aghion and Bolton, 1987; Diamond, 1991; Mian, 2006). Alternatively, by forcing more frequent information exchanges, shorter leases may allow landlords to better monitor tenants of lower quality and renegotiate leases when necessary. Contingent-payment leases may mitigate or exacerbate all the above effects depending on the parties' potentially private expectations of their future financial outcomes. These considerations lead to the first hypothesis, stated in the null.

Hypothesis 2: *Contingent-payment leases are not associated with the duration structure of the lease.*

I next test whether the extent to which a lease is contingent is associated with the level of any fixed payment in the lease. Similar to contingent-payment leases, Asquith et al. (2005), Beatty and Weber (2003), Bradley and Roberts (2015), Manso et al. (2010), and Roberts and Sufi (2009c) find that debt contracts often specify performance-contingent interest rates that are associated with the overall design of the contract. In my setting, leases are commonly designed to specify both a contingent component based on tenant sales and a fixed component. In the case that contingent-payment leases substitute for fixed-payment

[4]Related analyses are conducted by Barclay and Smith (1995), Bharath and Hertzel (2019), Brick and Ravid (1985), and Skinner (1993).

leases or mitigate agency problems between landlords and tenants, the contingent portion of a lease may vary inversely with any fixed portion across leases. In contrast, if contingent leases relate exclusively to the risk of tenant default, the contingent portion of a lease may vary positively with any fixed portion to yield larger total lease payments in expectation. These considerations lead to the next hypothesis, stated in the null.

Hypothesis 3: *Relative to pure fixed-payment lease contracts, contingent-payment lease contracts with both a contingent and a fixed component are not associated with the level of the fixed component.*

I next test for any difference in the adoption of contingent-payment lease contracts based on whether the tenant's financial statements are audited. To function properly, outcome-contingent contracts require reliable outcome measures that can be observed and verified, but not systematically manipulated (e.g., Aghion and Bolton, 1992; Holmström, 1979; Kim and Suh, 1993). Indeed, several studies find that the design of accounting-based debt and executive compensation contracts depends in part on the quality and overall contractibility of firms' accounting signals.[5] In my setting, contingent-payment leases depend directly on the tenant's sales, which must be reported to the landlord monthly. Tenant sales may become more contractible when their accounting is less susceptible to measurement error or managerial gaming, as when a firm receives an audit (e.g., Fan and Wong, 2005; Iliev, 2010; Minnis, 2011). By contrast, it is possible that these effects are unlikely to be a sample-wide problem if landlords are sophisticated enough to ex ante undo these distortions in the contract (e.g., specifying a higher percentage of sales to undo any sales manipulation), or if landlords can directly verify the tenant's sales themselves, perhaps through various financial monitoring technologies (e.g., Kumar and O'Brien, 2019; Sutherland, 2020). These considerations lead to the first hypothesis, stated in the null.

Hypothesis 4: *Contingent-payment lease contracts are not associated with whether the*

[5]For example, see Aier et al. (2014), Ball et al. (2008), Bharath et al. (2008), Carrizosa and Ryan (2017), Christensen and Nikolaev (2012, 2017), Costello and Wittenberg-Moerman (2011), Dichev and Skinner (2002), Nikolaev (2018), and Ozkan et al. (2012).

tenant's financial statements are audited.

I next test for a difference in the adoption rate of contingent-payment lease contracts based on information asymmetry between landlords and tenants, as measured by the geographic separation between a property and a landlord's headquarters. Garmaise and Moskowitz (2004, Section 3.1) find that geographic separation can exacerbate information asymmetries in the market for real estate ownership. In the lending and equity markets, heightened geographic separation is also widely used as a proxy for heightened information asymmetry between managers and investors.[6] For example, Mian (2006) and Sufi (2007) argue that increased geographic separation makes it harder for lenders to monitor their investments and leads to tighter constraints on borrowers, and Chava and Roberts (2008, p. 2087) find that lenders write more detailed contracts with firms when information asymmetry is high. Shleifer and Vishny (1997, p. 741-752) further argue that information asymmetry can be so severe as to deter the writing of contracts altogether.

In my setting, heightened information asymmetry and increased monitoring costs may decrease landlords' ability to verify their tenants' sales, which may decrease the adoption rate of contingent-payment leases. By contrast, if landlords are relatively less informed about the economic conditions in distanced markets and what is a competitive rent to charge there (Levitt and Syverson, 2008), they may rely more on contingent-payment leases in these markets. Consistent with this idea, Prendergast (2002) argues in a principal-agent framework that heightened information asymmetry may increase the principal's propensity to use a risk-sharing contract. These considerations lead to the next hypothesis, stated in the null.

Hypothesis 5: *Contingent-payment lease contracts are not associated with the geographic separation between the leased property and the landlord's headquarters.*

I next consider the tenant's total number of establishments. Guided by theory on

[6]For example, see Agarwal and Hauswald (2010), Amore et al. (2013), Armstrong et al. (2016), Chen and Vashishtha (2017), Coval and Moskowitz (1999, 2001), Dass and Massa (2011), Hauswald and Marquez (2006), Hollander and Verriest (2016), Lerner (1995), Mian (2006), Sufi (2007), and Vashishtha (2014).

repeated-game interactions, several studies find that the design of debt and executive compensation contracts varies according to a variety of implicit long-term reputational and relationship concerns.[7] For example, opportunistic behavior appears to have greater consequences for longer-term repeat relationships rather than shorter-term one-time relationships. Contingent-payment leases may therefore be more prevalent for tenants with multiple establishments, who are more likely to be concerned about their reputation in the broader real estate market and less likely to try to manipulate sales in a contingent-payment lease. Alternatively, emerging firms with unproven business models and fewer establishments might be precisely the firms that benefit the most from the risk-sharing benefits and flexibility of contingent-payment leases, leading to more contingent-payment leases in these cases. These considerations lead to the next hypothesis, stated in the null.

Hypothesis 6: *Contingent-payment lease contracts are not associated with the tenant's number of establishments.*

I next examine the negotiating power of the tenant based on the size of the tenant's lease, as measured by the square footage of the leased property. Bebchuk and Fried (2003), DeAngelo et al. (1994), Dichev and Skinner (2002), Murnighan and Bazerman (1990), Roberts (2015), and Roberts and Sufi (2009c) all make a case that negotiating power can play a significant role in the design of financial contracts. In my setting, size may confer negotiating power because it is likely costlier for landlords to lose a large tenant than a small tenant. In this case, larger tenants can use their negotiating power to ensure that a landlord's future leasing and operational decisions are made with their interests in mind, thus serving a similar purpose to having a landlord's income depend on their business success. Contingent-payment leases may therefore be less prevalent for larger tenants. In contrast, smaller tenants may find it easier to relocate, or credibly threaten to relocate, due to their

[7]For example, see Berger et al. (2017), Bharath et al. (2009), Bolton et al. (2016), Dass and Massa (2011), Dechow and Sloan (1991), Khan et al. (2019), Prilmeier (2017), Schenone (2009), and Sutherland (2018). MacLeod (2007) further surveys this literature.

lower levels of inventory and other assets kept on the premises.[8] This increased negotiating power may also affect the benefits and costs of writing contingent-payment leases. These considerations lead to the next hypothesis, stated in the null.

Hypothesis 7: *Contingent-payment lease contracts are not associated with the square footage of the leased property.*

It is also common for landlords to perform relationship-specific property improvements (i.e., build-outs) before a tenant occupies the property. Such investments may act as bonding mechanisms that reduce tenants' concerns about future opportunistic actions taken by landlords (e.g., Mulherin, 1986; Williamson, 1979). Contingent-payment leases may therefore be less prevalent for leases that involve property improvements. By contrast, landlords may use contingent-payment leases as a mechanism to help recoup the cost of these investments. Relationship-specific investments may also exacerbate any hold-up concerns, similar to relationships between firms and suppliers (Costello, 2013) and firms and investors (e.g., Duke and Hunt, 1990; Gompers and Lerner, 1996; Healy and Palepu, 1990; Kalay, 1982; Leuz, 1998; Schoenfeld, 2020). These considerations lead to the next hypothesis, stated in the null.

Hypothesis 8: *Contingent-payment lease contracts are not associated with tenant-specific property improvements.*

I next test whether the adoption of contingent-payment leases is associated with landlord sophistication, as proxied for by the size of a landlord's real estate portfolio measured by lease count. Theory predicts that the design of contracts is driven in part by the contracting parties' sophistication (e.g., Bolton and Scharfstein, 1998; Grossman and Hart, 1986). Consistent with this idea, Bharath et al. (2008), Nini et al. (2009, 2012), Roberts (2015), and Sufi (2007) find that the design of debt contracts is associated with measures of lender sophistication. In my setting, larger landlords with more experience may be more sophisticated in that they can better predict future market conditions, tenant sales, and other relevant

[8] As these examples illustrate, any agency problems between landlords and tenants are likely double-sided (e.g., Bhattacharyya and Lafontaine, 1995; Demski and Sappington, 1991).

outcomes; such landlords may also be better at enforcing or renegotiating contracts. Larger landlords may also be relatively more tolerant of risk given their larger portfolios (e.g., Loutskina and Strahan, 2011) while at the same time being indifferent toward contingent- and fixed-payment lease structures, assuming their cash flows are similar in expectation. Thus, it is not obvious ex ante how landlord sophistication may affect the design of lease contracts. These considerations lead to the next hypothesis, stated in the null.

Hypothesis 9: *Contingent-payment lease contracts are not associated with the size of a landlord's lease portfolio.*

Contingent-payment leases can also create tension for landlords. Although landlords may benefit from these leases based on the reasons above, their uncertain and contingent nature may make it harder for landlords to finance against them. This idea is consistent with Ball et al. (2015), Demerjian (2017), Dichev and Skinner (2002), Roberts (2015), and Roberts and Sufi (2009c), all of whom find that firm uncertainty is associated with the terms in debt contracts. In my setting, contingent-payment leases may expose landlords to more upside, in which case lenders may perceive increased value in contingent-payment leases. On the other hand, the uncertainty may negate these benefits. Thus, it is unclear ex ante whether the adoption of contingent-payment leases will be associated with whether a landlord owns or has financed a property. These considerations lead to the next hypothesis, stated in the null.

Hypothesis 10: *Contingent-payment lease contracts are not associated with whether a landlord owns or has financed the property.*

I next test whether contingent-payment leases are associated with the likelihood that tenants default on a lease, where default is defined in the data as any incidence of a lease payment being delinquent by 30 days or more over the lease.[9] Delinquencies likely imply

[9]Note that even if a tenant experiences low sales for a month and thus a proportionately low lease payment for that month, the tenant may still be unable to make its lease payment due to other operating costs that are fixed or may have increased over that month. In the extreme case that the contingent portion of a lease payment equals zero based on the tenant's sales for the month, the tenant still must pay the fixed component of the lease.

cash flows below what was expected due to the delayed payment, entail more extensive monitoring of the tenant (e.g., site visits), and often require actions for pursuing the delinquent payments. There are a few potential channels through which contingent-payment leases may be associated with delinquencies. First, contingent-payment leases may simply be riskier leases, in which case these leases may be associated with heightened default rates. Second, contingent-payment leases may represent leases for which landlords are competing to establish long-term relationships with tenants, in which case landlords may tolerate delinquencies in the short term. Bharath et al. (2009) and Petersen and Rajan (1994) argue that such effects occur in the lending markets. Third, contingent-payment leases may play an efficiency enhancing role in contracting and improve contract outcomes, in line with the longstanding proposition that accounting facilitates efficient contracting between firms and capital providers (e.g., Kurlat, 2016; Kurlat and Stroebel, 2015; Stroebel, 2016; Watts and Zimmerman, 1990). Theory is therefore ambiguous as to whether contingent-payment leases will be associated with the likelihood of tenant default. Note that this ex post analysis is purely descriptive in nature, not causal. These considerations lead to the last hypothesis, stated in the null.

Hypothesis 11: *Contingent-payment lease contracts are not associated with the likelihood of tenant default.*

3 Commercial real estate setting and CompStak data

3.1 The commercial real estate sector

The market for commercial real estate leases is comprised of a few national and many regional and sub-regional landlords who each account for a minority fraction of the total commercial real estate leases in the market (Deloitte, 2021). Some landlords finance their properties through mortgages and other means, whereas others own their properties outright. Some of the larger commercial real estate landlords include Nuveen, LaSalle Investment

Management, Clarion Partners, Tishman Speyer, The Carlyle Group, and Blackstone.

Commercial real estate properties are used exclusively for business purposes rather than residential purposes. Commercial real estate is widely considered to be the largest asset class in the world (Goetzmann et al., 2021; Poleg, 2021) and the largest asset class leased by businesses (Eisfeldt and Rampini, 2008; Grenadier, 1995). Commercial real estate is typically leased to tenants such as business owners, with properties ranging from single storefronts to large anchor properties. Commercial real estate tenants encompass several categories, including office space, hotels, healthcare, restaurants, and retail.

3.2 CompStak data

I assemble a sample of commercial real estate lease contracts using CompStak, which is a commercial real estate analytics platform that was established in 2012 to serve real estate brokers, landlords, and investors. CompStak employs a large analyst team that maintains one of the most comprehensive historical databases on commercial real estate leases. CompStak operates on a principle of reciprocity: real estate brokers, landlords, and investors may only use the platform if they share the lease terms of all their past, present, and future leases. Interestingly, this reciprocity model is common in the corporate financing industry. For example, PayNet, a commercial credit bureau whose loan and lease contract data are used in Darmouni and Sutherland (2020), Doblas-Madrid and Minetti (2013), and Sutherland (2018), also operates a reciprocity model in which it relies on data provided by users who opt into the service. CompStak's analysts rigorously corroborate and verify the details for all the lease transactions using public records, algorithms, and other data sources. Users are barred from the platform in the event of any misreporting. As in the above studies that use PayNet, I cannot know exactly whether omissions occur or their extent, as there is no single public repository of executed leases. However, any omissions would likely mean that my findings understate the adoption of contingent-payment lease contracts.

In studies analyzing other types of leases, Darmouni and Sutherland (2020), Doblas-

Madrid and Minetti (2013), and Sutherland (2018) all use random samples of a mix of loan and lease contracts from their data source, PayNet, with sample sizes ranging from 29,000 to 265,000 contracts. Although PayNet collects data on both loans and leases, the vast majority of its lease data involves non-real-estate assets, such as manufacturing equipment (Sutherland, 2018, Table 1). Given that neither Darmouni and Sutherland (2020), Doblas-Madrid and Minetti (2013), nor Sutherland (2018) identify accounting-based contingencies in their random sample of contracts, either these leases do not include such contingencies, PayNet does not denote whether leases have such contingencies, or such contingencies alluded the random samples or research scope in these studies.[10] Beatty et al. (2010, Section V) and Eisfeldt and Rampini (2008, Section 3.3) take a different approach to determine the existence of leases, namely by measuring the value of lease-related items capitalized and expensed on firms' balance sheets and income statements. These studies are therefore unable to determine whether leases have provisions stated in terms of accounting information.

A key advantage of using CompStak is that from 2012 onward, I have unrestricted access to all its data, which provide granular details on the nature of each lease contract, including whether a lease payment is contingent on tenant sales, the street address, square footage, price per square foot for any fixed component of the lease, lease duration, and various other attributes of the leases, landlords, and tenants.

4 Hypothesis testing

This section examines the benefits and costs of contingent-payment leases based on their cross-sectional adoption patterns. Following prior research, I use a revealed-preference approach (Samuelson, 1948) that takes the lease contracts as given and asks when these leases specify contingent lease payments. This approach is widely used in research on debt contracts and compensation contracts, where the underlying markets for firms, managers, and

[10]The use of random samples is a common practice in the contract literature (e.g., Costello, 2013; Joskow, 1987; Kaplan and Strömberg, 2003, 2004; Roberts, 2015, p. 62; Roberts and Sufi, 2009a, p. 1660; Roberts and Sufi, 2009c, p. 161; Sufi, 2009, p. 1063).

lenders are often not explicitly modeled (e.g., Akins et al., 2020; Chava and Roberts, 2008; Christensen and Nikolaev, 2012, 2017; Core et al., 1999). Lease contracts, however, have not received comparable research attention. I next test the theory-based empirical predictions developed in Section 2.

Hypothesis 1 examines whether contingent-payment lease adoption is significantly different across industrial tenants, office tenants, and retail tenants. Contingent-payment leases are concentrated entirely in the sample of leases between landlords and retail tenants. Of the 107,926 retail leases in the sample, about 27 percent or 29,140 of these are contingent-payment lease contracts, representing an economically large $24 billion in total lease payments over the sample period. This evidence suggests that writing contingent-payment leases is costlier or provides less benefit for landlords and industrial and office tenants, and that contingent-payment leases play a more prominent role in leases between landlords and retail tenants.

To more critically examine Hypothesis 1, Table 2 breaks down the sample of leases based on the year the lease commences. The sample is fairly well distributed across years, with 2019 being the most populous year. Data for 2020 is limited since data collection for that year ends in March. Looking within years, the first quarter of the year is the month when the most leases commence. Table 3 reports the top 20 states in the sample with the most lease contracts. California, Texas, and New York account for about 45 percent of the sample in sum, with all states having some representation in the sample. At a more granular level, Table 4 reports the 20 metropolitan statistical areas (MSAs) in the sample with the most lease contracts. The Los Angeles metro area, New York City, and the northern California Bay Area represent the top three MSAs, followed by Dallas and Sacramento. In total, about 100 different MSAs are represented in the sample of leases. Table 5 reports the tenant's primary industry. Food and beverage, retail, apparel, leisure and restaurants, and health care each account for at least five percent of the sample, which is expected given the focus on retail leases. Many other industries are also well represented in the sample.

Table 6 reports the distributions of all the other relevant variables included in the CompStak data. Foremost, 27 percent of the leases in the sample specify a contingent-payment arrangement whereby tenants pay a percentage of their monthly sales in rent, rather than a pure fixed amount. The average price per square foot (PSF) is about $32 (stated in annual PSF, not monthly PSF), with a median and standard deviation of $24 and $27, respectively. The lease durations average about 80 months, with a standard deviation of about 48 months, a 25th percentile of 50 months, a median of 60 months, and a 75th percentile of 120 months. About 24 percent of the tenants receive an audit, as reported by CompStak (the data, however, do not provide granular detail regarding the audit firm or cost of the audit). The mean (median) geographic separation between the leased property and landlord's location is 503 miles (610 miles) based on the addresses provided in the contract.

Table 6 also reports more granular details about the tenant, landlord, and nature of the leased property. The average tenant in the sample appears as a party to about 26 different leases, although the tenant at the 25th percentile is party to only one lease, and the median tenant is party to two different leases. The average (median) size of a leased property is about 3,900 (2,100) square feet. About 12 percent of the sample involves property improvements, which are customized alterations a landlord makes to a rental space as part of a lease. Many landlords are also party to multiple leases in the sample. Based on this number, I create the variable "Landlord Sophistication," which equals one if a landlord's total number of leases in the years leading up to and including the year a lease commences is in the top tercile of the sample, and zero otherwise. This variable is recomputed for every year of the sample, and therefore its mean does not equal one-third exactly because the deciles are not perfectly balanced across years. By this measure, about 40% of landlords are sophisticated. About 65 percent of the properties in the sample are owned by their landlord, rather than financed. About four percent of leases go into default, where default is defined in the data as any incidence of a lease payment being delinquent by 30 days or more.

Next, Hypothesis 2 examines whether contingent payments are associated with the du-

ration structure of the lease. I test this hypothesis in Table 7, Panel A, which partitions the leases based on the lease duration in months. The first column reports leases having durations of less than six months, the second column reports having durations of six to 12 months, and then each column increases in 12-month increments. This panel shows that 32,609 of the 107,926 leases in the sample are for 49 to 60 months, which represents the largest number of leases across all the windows. The second most-populous window is 97 to 120 months, which accounts for 23,262 leases. Leases having durations of 48 months or less account for about 24,000 leases in sum. Overall, there is broad representation across all the durations, with clusters seen at 49-60 months and 97-120 months.

The percentage of leases with contingent payments varies inversely and almost monotonically with the duration of the lease. At 37 percent, the highest percentage occurs in leases with a duration of less than 6 months and with a duration of 13-24 months. At 23 percent, the lowest percentage occurs in leases with a duration of 49-60 months. These percentages trend sharply downward as the lease duration increases, with about a 10 percent differential in the leases with a duration of 48 months or shorter compared to leases with a duration of 49 months or longer, on average. Overall, the adoption rate of contingent payments is strongly negatively associated with the duration of a lease. These findings suggest that in the design a lease, contingent payments are less beneficial for longer leases, consistent with prior research that has linked a contract's duration to its other features (e.g., Costello, 2013; Joskow, 1987; Sutherland, 2018).

Next, contingent-payment leases offer lease rates in which retail tenants pay a percentage of their monthly sales in rent, rather than a pure fixed amount. However, virtually all these leases still include an additional fixed component stated in terms of price per square foot (PSF). Therefore, a typical contingent-payment lease includes both a variable component based on tenant sales and a fixed component based on square footage (Appendix A provides an example). Hypothesis 3 examines whether or not these two components of the lease are related.

Table 7, Panel B, partitions the leases based on the PSF, as specified in the lease contract (stated in annual PSF, not monthly PSF). Leases with a PSF between \$10 and \$15 are the most common, with 17,849 of the 107,926 leases falling into this category, followed by leases with a PSF between \$15 and \$20 and then \$20 and \$25. The number of leases generally declines as the PSF increases toward \$70, although there is an uptick in the number of leases with a PSF above \$70.

The percentage of leases with contingent payments varies inversely and almost monotonically with the PSF. At 35 percent, leases with a PSF of less than \$10 have the highest adoption rate of contingent payments based on tenant sales. Contingent-payments adoption rates remain above 30 percent for PSF values below \$25. For PSF values between \$30 and \$40, 23 percent of leases have contingent payments. Adoption rates decrease further for PSF values above \$40, reaching a low of 16 percent for leases with a PSF between \$40 and \$50. Overall, these findings are consistent with the idea that landlords partly substitute contingent payments for fixed payments. When leases have contingent payments, the fixed payment decreases. This is consistent with Asquith et al. (2005) and Manso et al. (2010), both of whom find that in debt contracts, performance-contingent interest rates are associated with various other attributes of these contracts.

Note that other drivers of PSF potentially include regional differences in property quality and demand, as well as the size of the leased property. I therefore correlate the adoption rate of contingent payments with PSF while controlling for MSA, total square footage of the leased property, and year (untabulated). I continue to find a strong negative relation between the adoption rate of contingent payments and PSF (1% level).

Next, Hypothesis 4 tests for any difference in the adoption rate of contingent-payment lease contracts based on whether the tenant's financial statements are audited. Contingent-payment leases depend directly on the tenant's sales, which must be reported to the landlord monthly (see the reporting requirement in Appendix A). I test Hypothesis 4 and several of the remaining hypotheses using the following linear probability model, where i represents

the lease:

$$\text{Contingent-Payment Lease}_i = \alpha + \sum_{k=0}^{K} \beta_k \text{Lease Characteristic}_i + \sum \text{Fixed Effects} + \epsilon_i, \tag{1}$$

where *Contingent-Payment Lease*$_i$ is an indicator variable that equals one if lease contract i specifies a lease payment stated in terms of a percentage of the tenant's monthly sales, and zero otherwise, as specified in the contract. Eq. (1) also includes fixed effects for the year the lease commences, tenant industry, and MSA (location). I begin in Table 8, column 1, with a baseline specification that includes the fixed effects and the main variable of interest, *Tenant Receives Audit*$_i$, which is an indicator variable that equals one if the tenant for lease i receives a financial statement audit, and zero otherwise.

In Table 8, column 1, I find that the adoption rate of contingent-payment leases increases in likelihood by about 6.5 percentage points in cases where the tenant is audited (1% level). In terms of economic magnitude, this effect is one the largest observed in the sample as it pertains to the adoption rate of contingent-payment leases, and is particularly strong in light of the fact that the overall adoption rate of contingent leases is 27 percent. My interpretation of this finding is that audits, by increasing the overall quality and contractability of the tenant's accounting information (e.g., Fan and Wong, 2005; Iliev, 2010; Minnis, 2011), make tenants better candidates for contingent-payment leases. The landlord can be less concerned about the tenant manipulating or producing inaccurate sales numbers, and do not have to bear the full cost of verifying the tenant's sales themselves. Accounting quality thus appears to play an important role in the design of lease contracts, consistent with prior studies that find that the design of debt and executive compensation contracts depends in part on the quality and contractibility of firms' accounting signals (e.g., Ball et al., 2008; Bharath et al., 2008; Ozkan et al., 2012).

Next, Hypothesis 5 is designed to be a test of one of the most pervasive agency problems

in the literature, asymmetric information between entities. I test Hypothesis 5 in Table 8, column 2 by examining the association between the adoption rate of contingent-payment leases and the geographical separation between the landlord and tenant, which is a widely used proxy for information asymmetries between entities (e.g., Armstrong et al., 2016; Dass and Massa, 2011; Hauswald and Marquez, 2006; Hollander and Verriest, 2016; Garmaise and Moskowitz, 2004; Vashishtha, 2014). Following prior studies, I interpret higher levels of geographic separation as representing heightened information asymmetry (i.e., as increasing the cost of monitoring). In Table 8, column 2, I find that the adoption rate of contingent-payment leases decreases in likelihood by about 2.0 percentage points for a one standard deviation increase in the log of geographical separation (1% level). Thus, this finding suggests that heightened information asymmetry between landlords and tenants increases the net cost of adopting contingent-payment leases, consistent with prior studies that find that geographical separation can affect the design of debt contracts (e.g., Sufi, 2007).

I next examine Hypothesis 6, which tests the relation between the adoption rate of contingent-payment leases and a tenant's total number of establishments. In Table 8, column 3, I find that the adoption rate of contingent-payment leases decreases in likelihood by about 0.2 percentage points for a one standard deviation increase in the log of a tenant's number of establishments (1% level). One interpretation of this finding is that, on average, firms with fewer establishments and perhaps unproven business models are the firms that most value the risk-sharing benefits and flexibility of contingent-payment leases, consistent with the argument in Section 2.

Next, Hypothesis 7 examines whether the adoption rate of contingent-payment leases is associated with the size of the leased property. Size is important in this setting because it may confer negotiating power to tenants, and negotiating power likely plays a significant role in the design of all contracts (e.g., Bebchuk and Fried, 2003; MacLeod, 2007). For example, it is likely costlier for landlords to lose a large tenant than a small tenant, which in turn may affect the adoption rate of contingent-payment leases. In Table 8, column 4, I find that the

adoption rate of contingent-payment leases increases in likelihood by about 1.3 percentage points for a one standard deviation increase in the log of the square footage of the leased property (1% level). One interpretation of this finding is that larger tenants leverage their negotiating power to get contingent-payment leases and therefore some downside protection in the case that business conditions fall short of what was expected.

Turning to Hypothesis 8, landlords often perform customized alterations to a rental space as part of a lease (commonly referred to in industry as *build-outs* or *tenant improvements*). Such investments may act as bonding mechanisms that impact the adoption rate of contingent-payment leases. Hypothesis 8 tests whether this is the case in the sample. In Table 8, column 5, I find that there is no statistically significant relation between the adoption rate of contingent-payment leases and property improvements (10% level). This finding could be due to low power since only 12 percent of leases involve property improvements. Alternatively, it could be that one mechanism does not dominate in the sample: some landlords may use contingent-payment leases as a mechanism to help recoup the cost of property improvements, whereas other landlords rely more on fixed-payment leases to do so.

Next, Hypothesis 9 tests whether the adoption rate of contingent-payment leases is associated with landlord sophistication. Contingent-payment leases require landlords to monitor the tenant, verify the tenant's sales numbers, and have a reasonably accurate ex ante expectation of local business conditions and the tenant's future sales. These leases are therefore significantly more complex than fixed-payment leases. In Table 8, column 6, I find that the adoption rate of contingent-payment leases increases in likelihood by about 2.3 percentage points for sophisticated lenders, as defined in Appendix B(1% level). This finding supports the idea that it is less costly for sophisticated lenders to write contingent-payment leases, consistent with studies that find that the design of debt contracts is associated with measures of lender sophistication (e.g., Bharath et al., 2008; Nini et al., 2009, 2012; Roberts, 2015).

Next, Hypothesis 10 tests whether the adoption rate of contingent-payment leases is associated with whether the landlord owns or has financed the underlying leased prop-

erty. Contingent-payment leases can potentially create tension for landlords by making cash flows more uncertain and in turn making it harder for landlords to finance against them relative to fixed-payment leases. In Table 8, column 7, I find that the adoption rate of contingent-payment leases increases in likelihood by about 3.4 percentage points when the landlord owns, rather than finances, the underlying leased property. This finding suggests that financing concerns are a key reason behind whether landlords choose to use fixed- or contingent-payment lease contracts. To the extent this finding is being driven by the uncertainty inherent to contingent-payment lease contracts, it is consistent with studies that find that firm uncertainty is associated with the design of debt contracts (e.g., Demerjian, 2017; Roberts, 2015; Roberts and Sufi, 2009c).

Table 8, column 8, includes all the variables at once and shows that all these results are robust to cross-correlations. In fact, the coefficient for tenant improvements becomes marginally statistically significantly negative (10% level). The overall r-squared of the model is also reasonably good at 32 percent. To put the explanatory power of this model in perspective, Christensen and Nikolaev (2012, Table 3) have an r-squared of about 23 percent in their empirical model of different loan covenants.

Hypothesis 11 tests whether contingent-payment leases are associated with the likelihood that tenants default on a lease, where default is defined in the data as any incidence of a lease payment being delinquent by 30 days or more. Delinquencies imply cash flows below what was expected due to the delayed payment, entail more extensive monitoring of the tenant (e.g., site visits), and often require actions for pursuing the delinquent payments. There are a few potential channels through which contingent-payment leases may be associated with delinquencies. First, contingent-payment leases may be riskier leases, in which case these leases may be associated with more delinquencies. Second, contingent-payment leases may represent leases for which landlords are competing to establish long-term relationships, in which case landlords may tolerate delinquencies in the short run. Bharath et al. (2009) and Petersen and Rajan (1994) argue that such effects occur in the lending markets.

Third, contingent-payment leases may play an efficiency enhancing role in contracting and improve contract outcomes, in line with the longstanding proposition that accounting facilitates efficient contracting between firms and capital providers (e.g., Kurlat, 2016; Kurlat and Stroebel, 2015; Stroebel, 2016; Watts and Zimmerman, 1990). Note that this ex post analysis is purely descriptive in nature.

I test Hypothesis 11 by developing the following linear probability model of tenant default using most of the data available in CompStak, where i represents the lease:

$$\begin{aligned}\text{Tenant Default}_i = \alpha + \beta_0 \text{Contingent-Payment Lease} + \sum_{k=1}^{K} \beta_k \text{Lease Characteristic}_i \\ + \sum \text{Fixed Effects} + \epsilon_i.\end{aligned} \tag{2}$$

Tenant Default$_i$ is an indicator variable that equals one if a tenant defaults on the lease, where default is defined as any incidence of a lease payment being delinquent by 30 days or more, and zero otherwise, as reported by CompStak. Eq. (2) also includes fixed effects for the year the lease commences, tenant industry, and MSA (location), as well as the fixed price per square foot and the lease duration. I begin in Table 9, column 1, with a baseline specification that includes the fixed effects and the main variable of interest, *Contingent-Payment Lease*$_i$, which is an indicator variable that equals one if a lease contract specifies a lease payment stated in terms of a percentage of the tenant's monthly sales, and zero otherwise, as specified in the lease contract. The key result in Table 9 is that the tenant default rate is 1.2 percentage points lower for contingent-payment leases compared to fixed-payment leases (1% level). This result is robust to including all the other variables in Table 9, column 11. While purely descriptive in nature, this finding is consistent with these contingent-payment leases improving lease quality, as measured by the likelihood of tenant default. The hypothesis that contingent-payment leases are riskier leases with higher expected default rates does not appear to be supported by the data.

Several other variables in Table 9 are also significant predictors of tenant default. Default

rates are lower in leases with higher PSF, with longer duration leases, when tenants are audited, when tenants have more establishments, for larger leased properties, for sophisticated landlords, and when landlords own the underlying leased property. By contrast, default rates are higher in leases with heightened geographical separation, which is a widely used measure of information asymmetry. Importantly, the coefficient for contingent-payment leases, as well as many of the other coefficients, are economically meaningful given that the sample-wide default rate is about four percent. Overall, the collective evidence is some of the first to demonstrate the important role played by accounting in corporate lease financing.

5 Comparing lease contracts to debt contracts

As a final synthesis of the results, I summarize the key differences in how contingent-payment lease contracts function compared to private debt contracts. I focus this analysis on private debt contracts as opposed to public bond indentures because the latter typically specify "incurrence-based" covenants that require the borrower to be in compliance only at the time of a specific event, such as a future debt issuance (e.g., Nini et al., 2012, p. 1720). Contingent-payment leases and private debt contracts are more alike in that they commonly specify outcome-contingent covenants that are in effect continuously. Contingent-payment leases and private debt contracts are also alike in that there are not deep secondary markets for these contracts, whereas bonds can change hands relatively frequently.

Conceptually, lessors' and debtholders' investment returns are functions of similar inputs. Lessors and debtholders typically receive fixed payments from a firm and do not directly benefit from any increases in firm value beyond certain thresholds. In the event of a breach of contract, lessors can repossess the leased asset and sue for monetary damages, whereas debtholders can contractually induce principal repayment, liquidation, and bankruptcy. Unlike contingent-payment lease contracts, debt contracts often specify various accounting-based affirmative and negative covenants based on balance sheet metrics.

Similar to contingent-payment leases, debt contracts often specify performance-contingent interest payments that are associated with the overall design of the contract, although unlike contingent-payment leases, these payments typically do not rely directly on the firm's sales (e.g., Asquith et al., 2005; Beatty and Weber, 2003; Bradley and Roberts, 2015; Manso et al., 2010; Roberts and Sufi, 2009c). Taken together, these findings are important considerations for future research on financial contracts.

6 Conclusion

This study examines how accounting is related to lease contracts for commercial real estate, which is the most commonly leased asset by firms and largest asset class worldwide (Goetzmann et al., 2021). An understudied practice is that commercial landlords routinely share in the risk of retail tenants' businesses by way of writing lease contracts that require tenants to submit their monthly income statements to landlords and pay a percentage of sales in rent, rather than a fixed amount. Property rights theory predicts that the use of such contingent payments involves a trade-off between the benefits of risk sharing and the costs of producing a contractible signal ex post (e.g., Shavell, 1979). Theory also predicts that these types of contracts are likely the result of negotiations whose outcomes depend on the parties' domain knowledge, risk tolerance, and agency problems arising from misaligned motives and asymmetric information (e.g., Grossman and Hart, 1986). To investigate the benefits and costs of writing such leases, I use the above framework to develop testable empirical predictions that are in line with these theories.

One of the strongest results is that the benefits of contingent-payment leases appear to be the greatest when landlord-tenant information asymmetry is relatively low, as predicted by theory. The evidence also suggests that landlords' and tenants' reputations, sophistication, risk tolerance, and concerns about misaligned motives all play an important role in the choice to write contingent-payment leases. These findings provide some of the first system-

atic evidence on the direct role played by accounting in lease financing and the economic significance of this role. Understanding the anatomy of financial contracts is important for all contract research and is a topic of fundamental importance to researchers in accounting, economics, and finance.

Taken together, my findings also support the longstanding conjecture that accounting facilitates contracting between firms and capital providers (e.g., Watts and Zimmerman, 1990). Future research should benefit from understanding how the differential role of accounting depends on the nature of the financing and contracting environment. Future research could also extend this study by examining the drivers of the other provisions in lease contracts. This progression would follow the path taken by research on debt contracts, which has made significant progress toward explaining the adoption of specific covenants in those contracts.

References

Acheson, G. G., Campbell, G., Turner, J. D., 2019. Private Contracting, Law and Finance. Review of Financial Studies, 32, 4156–4195.

Agarwal, S., Hauswald, R., 2010. Distance and Private Information in Lending. Review of Financial Studies 23, 2757–2788.

Aghion, P., Bolton, P., 1987. Contracts as a barrier to entry. American Economic Review 77, 388–401.

Aghion, P., Bolton, P., 1992. An Incomplete Contracts Approach to Financial Contracting. Review of Economic Studies 59, 473–494.

Aier, J., Chen, L., Pevzner, M., 2014. Debtholders' Demand for Conservatism: Evidence from Changes in Directors' Fiduciary Duties. Journal of Accounting Research 52, 993–1027.

Akins, B., De Angelis, D., Gaulin, M., 2020. Debt contracting on management. Journal of Finance 75, 2095–2137.

Allee, K., Yohn, T., 2009. The Demand for Financial Statements in an Unregulated Environment: An Examination of the Production and Use of Financial Statements by Privately Held Small Businesses. The Accounting Review 84, 1–25.

Amore, M. D., Schneider, C., Žaldokas, A., 2013. Credit supply and corporate innovation. Journal of Financial Economics 109, 835–855.

Ang, J., Peterson, P., 1984. The Leasing Puzzle. Journal of Finance 39, 1055–1065.

Armstrong, C., Guay, W., Mehran, H., Weber, J., 2016. The Role of Financial Reporting and Transparency in Corporate Governance. Economic Policy Review 22, 107–128.

Armstrong, C., Guay, W., Weber, J., 2010. The role of information and financial reporting in corporate governance and debt contracting. Journal of Accounting and Economics 50, 179–234.

Asquith, P., Beatty, A., Weber, J., 2005. Performance pricing in bank debt contracts. Journal of Accounting and Economics 40, 101–128.

Bailey, M., Dávila, E., Kuchler, T., Stroebel, J., 2019. House price beliefs and mortgage leverage choice. Review of Economic Studies 86, 240–2452.

Ball, R., Bushman, R., Vasvari, F., 2008. The Debt-Contracting Value of Accounting Information and Loan Syndicate Structure. Journal of Accounting Research 46, 247–287.

Ball, R., Li, X., Shivakumar, L., 2015. Contractibility and transparency of financial statement information prepared under IFRS: Evidence from debt contracts around IFRS adoption. Journal of Accounting Research 53, 915–963.

Barclay, M. J., Smith, C. W., 1995. The maturity structure of corporate debt. Journal of Finance 50, 609–631.

Beatty, A., Liao, S., Weber, J., 2010. Financial Reporting Quality, Private Information, Monitoring, and the Lease-versus-Buy Decision. The Accounting Review 85, 1215–1238.

Beatty, A., Weber, J., 2003. The effects of debt contracting on voluntary accounting method changes. The Accounting Review 78, 119–142.

Bebchuk, L. A., Fried, J. M., 2003. Executive compensation as an agency problem. Journal of Economic Perspectives 17, 71–92.

Benmelech, E., Meisenzahl, R. R., Ramcharan, R., 2016. The Real Effects of Liquidity During the Financial Crisis: Evidence from Automobiles. Quarterly Journal of Economics 132, 317–365.

Berger, P., Minnis, M., Sutherland, A., 2017. Commercial lending concentration and bank expertise: Evidence from borrower financial statements. Journal of Accounting and Economics 64, 253–277.

Bharath, S. T., Dahiya, S., Saunders, A., Srinivasan, A., 2009. Lending Relationships and Loan Contract Terms. Review of Financial Studies 24, 1141–1203.

Bharath, S. T., Hertzel, M., 2019. External Governance and Debt Structure. Review of Financial Studies 32, 3335–3365.

Bharath, S. T., Sunder, J., Sunder, S. V., 2008. Accounting Quality and Debt Contracting. The Accounting Review 83, 1–28.

Bhattacharyya, S., Lafontaine, F., 1995. Double-Sided Moral Hazard and the Nature of Share Contracts. RAND Journal of Economics 26, 761–781.

Bolton, P., Freixas, X., Gambacorta, L., Mistrulli, P. E., 2016. Relationship and Transaction Lending in a Crisis. Review of Financial Studies 29, 2643–2676.

Bolton, P., Scharfstein, D. S., 1998. Corporate Finance, the Theory of the Firm, and Organizations. Journal of Economic Perspectives 12, 95–114.

Bradley, M., Roberts, M. R., 2015. The structure and pricing of corporate debt covenants. Quarterly Journal of Finance 5, 1–37.

Brick, I. E., Ravid, S., 1985. On the Relevance of Debt Maturity Structure. Journal of Finance 40, 1423–1437.

Brueckner, J. K., 1993. Inter-store externalities and space allocation in shopping centers. Journal of Real Estate Finance and Economics 7, 5–16.

Bushman, R., Smith, A., 2001. Financial accounting information and corporate governance. Journal of Accounting and Economics 32, 237–333.

Carrizosa, R., Ryan, S. G., 2017. Borrower private information covenants and loan contract monitoring. Journal of Accounting and Economics 64, 313–339.

Chava, S., Roberts, M. R., 2008. How Does Financing Impact Investment? The Role of Debt Covenants. Journal of Finance 63, 2085–2121.

Chen, Q., Vashishtha, R., 2017. The effects of bank mergers on corporate information disclosure. Journal of Accounting and Economics 64, 56–77.

Christensen, H., Nikolaev, V., 2012. Capital Versus Performance Covenants in Debt Contracts. Journal of Accounting Research 50, 75–116.

Christensen, H., Nikolaev, V., 2017. Contracting on GAAP Changes: Large Sample Evidence. Journal of Accounting Research 55, 1021–1050.

Christensen, H., Nikolaev, V., Wittenberg-Moerman, R., 2016. Accounting Information in Financial Contracting: The Incomplete Contract Theory Perspective. Journal of Accounting Research 54, 397–435.

Christie, A. A., Zimmerman, J. L., 1994. Efficient and Opportunistic Choices of Accounting Procedures: Corporate Control Contests. The Accounting Review 69, 539–566.

Core, J. E., Holthausen, R. W., Larcker, D. F., 1999. Corporate governance, chief executive officer compensation, and firm performance. Journal of Financial Economics 51, 371–406.

Costello, A., 2013. Mitigating incentive conflicts in inter-firm relationships: Evidence from long-term supply contracts. Journal of Accounting and Economics 56, 19–39.

Costello, A., Wittenberg-Moerman, R., 2011. The impact of financial reporting quality on debt contracting: Evidence from internal control weakness reports. Journal of Accounting Research 49, 97–136.

Coval, J. D., Moskowitz, T. J., 1999. Home bias at home: Local equity preference in domestic portfolios. Journal of Finance 54, 2045–2073.

Coval, J. D., Moskowitz, T. J., 2001. The geography of investment: Informed trading and asset prices. Journal of Political Economy 109, 811–841.

Darmouni, O., Sutherland, A., 2020. Learning about Competitors: Evidence from SME Lending. Review of Financial Studies 34, 2275–2317.

Dass, N., Massa, M., 2011. The Impact of a Strong Bank-Firm Relationship on the Borrowing Firm. Review of Financial Studies 24, 1204–1260.

DeAngelo, H., DeAngelo, L., Skinner, D. J., 1994. Accounting choice in troubled companies. Journal of Accounting and Economics 17, 113–143.

Dechow, P. M., Sloan, R. G., 1991. Executive incentives and the horizon problem: An empirical investigation. Journal of Accounting and Economics 14, 51–89.

Deloitte, 2021. 2021 Commercial Real Estate Outlook (`https://www2.deloitte.com/us/en/insights/industry/financial-services/commercial-real-estate-outlook.html`).

Demerjian, P., 2017. Uncertainty and debt covenants. Review of Accounting Studies 22, 1156–1197.

Demski, J., Sappington, D., 1991. Resolving Double Moral Hazard Problems with Buyout Agreements. RAND Journal of Economics 22, 232–240.

Diamond, D., 1991. Debt Maturity Structure and Liquidity Risk. Quarterly Journal of Economics 106, 709–737.

Dichev, I., Skinner, D., 2002. Large–Sample Evidence on the Debt Covenant Hypothesis. Journal of Accounting Research 40, 1091–1123.

Doblas-Madrid, A., Minetti, R., 2013. Sharing information in the credit market: Contract-level evidence from U.S. firms. Journal of Financial Economics 109, 198–223.

Duke, J. C., Hunt, H. G., 1990. An empirical examination of debt covenant restrictions and accounting-related debt proxies. Journal of Accounting and Economics 12, 45–63.

Eisfeldt, A. L., Rampini, A. A., 2006. Capital reallocation and liquidity. Journal of Monetary Economics 53, 369–399.

Eisfeldt, A. L., Rampini, A. A., 2008. Leasing, Ability to Repossess, and Debt Capacity. Review of Financial Studies 22, 1621–1657.

El-Gazzar, S., Lilien, S., Pastena, V., 1986. Accounting for leases by lessees. Journal of Accounting and Economics 8, 217–237.

Fan, J. P., Wong, T., 2005. Do External Auditors Perform a Corporate Governance Role in Emerging Markets? Evidence from East Asia. Journal of Accounting Research 43, 35–72.

Fields, T. D., Lys, T. Z., Vincent, L., 2001. Empirical research on accounting choice. Journal of Accounting and Economics 31, 255–307.

Franks, J. R., Hodges, S. D., 1978. Valuation of Financial Lease Contracts: A Note. Journal of Finance 33, 657–669.

Garmaise, M. J., Moskowitz, T. J., 2004. Confronting information asymmetries: Evidence from real estate markets. Review of Financial Studies 17, 405–437.

Gavazza, A., 2011. Leasing and Secondary Markets: Theory and Evidence from Commercial Aircraft. Journal of Political Economy 119, 325–377.

Gilligan, T. W., 2004. Lemons and Leases in the Used Business Aircraft Market. Journal of Political Economy 112, 1157–1180.

Goetzmann, W. N., Spaenjers, C., Van Nieuwerburgh, S., 2021. Real and Private-Value Assets. Review of Financial Studies 34, 3497–3526.

Gompers, P., Lerner, J., 1996. The use of covenants: An empirical analysis of venture partnership agreements. The Journal of Law and Economics 39, 463–498.

Graham, J. R., Leary, M. T., 2011. A Review of Empirical Capital Structure Research and Directions for the Future. Annual Review of Financial Economics 3, 309–345.

Graham, J. R., Lemmon, M. L., Schallheim, J. S., 1998. Debt, Leases, Taxes, and the Endogeneity of Corporate Tax Status. Journal of Finance 53, 131–162.

Grenadier, S. R., 1995. Valuing lease contracts a real-options approach. Journal of Financial Economics 38, 297–331.

Grossman, S., Hart, O., 1986. The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration. Journal of Political Economy 94, 691–719.

Guven, G., Inci, E., Russo, A., 2019. Competition, Concentration and Percentage Rent in Retail Leasing. Real Estate Economics Forthcoming.

Hart, O., 1995. Firms, Contracts, and Financial Structure. Clarendon Press.

Hauswald, R., Marquez, R., 2006. Competition and Strategic Information Acquisition in Credit Markets. Review of Financial Studies 19, 967–1000.

Healy, P. M., Palepu, K. G., 1990. Effectiveness of accounting-based dividend covenants. Journal of Accounting and Economics 12, 97–123.

Hollander, S., Verriest, A., 2016. Bridging the gap: the design of bank loan contracts and distance. Journal of Financial Economics 119, 399–419.

Holmström, B., 1979. Moral Hazard and Observability. The Bell Journal of Economics 10, 74–91.

Holthausen, R. W., Leftwich, R. W., 1983. The economic consequences of accounting choice implications of costly contracting and monitoring. Journal of Accounting and Economics 5, 77–117.

Holthausen, R. W., Watts, R. L., 2001. The relevance of the value-relevance literature for financial accounting standard setting. Journal of Accounting and Economics 31, 3–75.

Iliev, P., 2010. The Effect of SOX Section 404: Costs, Earnings Quality, and Stock Prices. The Journal of Finance 65, 1163–1196.

Imhoff, E. A., Thomas, J. K., 1988. Economic consequences of accounting standards: The lease disclosure rule change. Journal of Accounting and Economics 10, 277–310.

Joskow, P., 1987. Contract Duration and Relationship-Specific Investments: Empirical Evidence from Coal Markets. American Economic Review 77, 168–185.

Kalay, A., 1982. Stockholder-bondholder conflict and dividend constraints. Journal of Financial Economics 10, 211–233.

Kaplan, S., Strömberg, P., 2003. Financial Contracting Theory Meets the Real World: An Empirical Analysis of Venture Capital Contracts. Review of Economic Studies 70, 281–315.

Kaplan, S., Strömberg, P., 2004. Characteristics, Contracts, and Actions: Evidence from Venture Capitalist Analyses. Journal of Finance 59, 2177–2210.

Khan, U., Li, X., Williams, C. D., Wittenberg-Moerman, R., 2019. The Effect of Information Opacity and Accounting Irregularities on Personal Lending Relationships: Evidence from Lender and Manager Co-Migration. The Accounting Review 94, 303–344.

Kim, O., Suh, Y., 1993. Incentive efficiency of compensation based on accounting and market performance. Journal of Accounting and Economics 16, 25–53.

Kothari, S., Ramanna, K., Skinner, D., 2010. Implications for gaap from an analysis of positive research in accounting. Journal of Accounting and Economics 50, 246–286.

Kumar, R., O'Brien, S., 2019. Findings from the Diary of Consumer Payment Choice. Federal Reserve Bank of San Francisco, June 2019.

Kurlat, P., 2016. Asset markets with heterogeneous information. Econometrica 84, 33–85.

Kurlat, P., Stroebel, J., 2015. Testing for information asymmetries in real estate markets. Review of Financial Studies 28, 2429–2461.

Lambert, R., 2001. Contracting theory and accounting. Journal of Accounting and Economics 32, 3–87.

Lee, K., 1995. Optimal retail lease contracts: the principal-agent approach. Regional Science and Urban Economics 25, 727–738.

Lerner, J., 1995. Venture capitalists and the oversight of private firms. Journal of Finance 50, 301–318.

Leuz, C., 1998. The role of accrual accounting in restricting dividends to shareholders. European Accounting Review 7, 579–604.

Levitt, S. D., Syverson, C., 2008. Market distortions when agents are better informed: The value of information in real estate transactions. Review of Economics and Statistics 90, 599–611.

Lewellen, W. G., Long, M. S., McConnell, J. J., 1976. Asset leasing in competitive capital markets. Journal of Finance 31, 787–798.

Lisowsky, P., Minnis, M., 2020. The Silent Majority: Private U.S. Firms and Financial Reporting Choices. Journal of Accounting Research 58, 547–588.

Loutskina, E., Strahan, P. E., 2011. Informed and uninformed investment in housing: The downside of diversification. Review of Financial Studies 24, 1447–1480.

MacLeod, W. B., 2007. Reputations, Relationships, and Contract Enforcement. Journal of Economic Literature 45, 595–628.

Manso, G., Strulovici, B., Tchistyi, A., 2010. Performance-Sensitive Debt. Review of Financial Studies 23, 1819–1854.

McConnell, J. J., Schallheim, J. S., 1983. Valuation of asset leasing contracts. Journal of Financial Economics 12, 237–261.

Mian, A., 2006. Distance Constraints: The Limits of Foreign Lending in Poor Economies. Journal of Finance 61, 1465–1505.

Mian, A., Sufi, A., 2017. Fraudulent Income Overstatement on Mortgage Applications During the Credit Expansion of 2002 to 2005. Review of Financial Studies 30, 1832–1864.

Minnis, M., 2011. The Value of Financial Statement Verification in Debt Financing: Evidence from Private U.S. Firms. Journal of Accounting Research 49, 457–506.

Minnis, M., Sutherland, A., 2017. Financial Statements as Monitoring Mechanisms: Evidence from Small Commercial Loans. Journal of Accounting Research 55, 197–233.

Mulherin, J. H., 1986. Complexity in Long-term Contracts: An Analysis of Natural Gas Contractual Provisions. Journal of Law, Economics, and Organization 2, 105–117.

Murfin, J., Pratt, R., 2019. Who Finances Durable Goods and Why It Matters: Captive Finance and the Coase Conjecture. Journal of Finance 74, 755–793.

Murnighan, J. K., Bazerman, M. H., 1990. A perspective on negotiation research in accounting and auditing. The Accounting Review 65, 642–657.

Murphy, K. J., 1999. Chapter 38 Executive Compensation. Elsevier, vol. 3, Part B of *Handbook of Labor Economics*, pp. 2485–2563.

Myers, S. C., 2001. Capital Structure. Journal of Economic Perspectives 15, 81–102.

Myers, S. C., Dill, D. A., Bautista, A. J., 1976. Valuation of Financial Lease Contracts. Journal of Finance 31, 799–819.

Nikolaev, V., 2018. Scope for renegotiation in private debt contracts. Journal of Accounting and Economics 65, 270–301.

Nini, G., Smith, D. C., Sufi, A., 2009. Creditor control rights and firm investment policy. Journal of Financial Economics 92, 400–420.

Nini, G., Smith, D. C., Sufi, A., 2012. Creditor Control Rights, Corporate Governance, and Firm Value. Review of Financial Studies 25, 1713–1761.

Ozkan, N., Singer, Z., You, H., 2012. Mandatory IFRS Adoption and the Contractual Usefulness of Accounting Information in Executive Compensation. Journal of Accounting Research 50, 1077–1107.

Petersen, M. A., Rajan, R. G., 1994. The benefits of lending relationships: Evidence from small business data. Journal of Finance 49, 3–37.

Piazzesi, M., Schneider, M., Stroebel, J., 2020. Segmented housing search. American Economic Review 110, 720–59.

Poleg, D., 2021. Rethinking Real Estate: A Roadmap to Technology's Impact on the World's Largest Asset Class. Upfront Books.

Prendergast, C., 1999. The Provision of Incentives in Firms. Journal of Economic Literature 37, 7–63.

Prendergast, C., 2002. The Tenuous Trade-off between Risk and Incentives. Journal of Political Economy 110, 1071–1102.

Prilmeier, R., 2017. Why do loans contain covenants? Evidence from lending relationships. Journal of Financial Economics 123, 558–579.

Roberts, M., Sufi, A., 2009a. Control Rights and Capital Structure: An Empirical Investigation. Journal of Finance 64, 1657–1695.

Roberts, M., Sufi, A., 2009b. Financial contracting: A survey of empirical research and future directions. Annual Review of Financial Economics 1, 207–226.

Roberts, M., Sufi, A., 2009c. Renegotiation of financial contracts: Evidence from private credit agreements. Journal of Financial Economics 93, 159–184.

Roberts, M. R., 2015. The role of dynamic renegotiation and asymmetric information in financial contracting. Journal of Financial Economics 116, 61–81.

Roychowdhury, S., Shroff, N., Verdi, R. S., 2019. The effects of financial reporting and disclosure on corporate investment: A review. Journal of Accounting and Economics 68, 1–27.

Samuelson, P. A., 1948. Consumption Theory in Terms of Revealed Preference. Economica 15, 243–253.

Schallheim, J. S., Johnson, R. E., Lease, R. C., McConnell, J. J., 1987. The determinants of yields on financial leasing contracts. Journal of Financial Economics 19, 45–67.

Schenone, C., 2009. Lending Relationships and Information Rents: Do Banks Exploit Their Information Advantages? Review of Financial Studies 23, 1149–1199.

Schoenfeld, J., 2020. Contracts between firms and shareholders. Journal of Accounting Research 58, 383–427.

Sharpe, S. A., Nguyen, H. H., 1995. Capital market imperfections and the incentive to lease. Journal of Financial Economics 39, 271–294.

Shavell, S., 1979. Risk sharing and incentives in the principal and agent relationship. Bell Journal of Economics 10, 55–73.

Shleifer, A., Vishny, R., 1997. A Survey of Corporate Governance. Journal of Finance 52, 737–783.

Skinner, D. J., 1993. The investment opportunity set and accounting procedure choice: Preliminary evidence. Journal of Accounting and Economics 16, 407–445.

Smith, C., Warner, J., 1979. On financial contracting: An analysis of bond covenants. Journal of Financial Economics 7, 117–161.

Smith, C. W., Wakeman, L. M., 1985. Determinants of corporate leasing policy. Journal of Finance 40, 895–908.

Smith, C. W., Watts, R. L., 1992. The investment opportunity set and corporate financing, dividend, and compensation policies. Journal of Financial Economics 32, 263–292.

Stroebel, J., 2016. Asymmetric information about collateral values. Journal of Finance 71, 1071–1112.

Stroebel, J., Vavra, J., 2019. House prices, local demand, and retail prices. Journal of Political Economy 127, 1391–1436.

Sufi, A., 2007. Information Asymmetry and Financing Arrangements: Evidence from Syndicated Loans. Journal of Finance 62, 629–668.

Sufi, A., 2009. Bank Lines of Credit in Corporate Finance: An Empirical Analysis. Review of Financial Studies 22, 1057–1088.

Sutherland, A., 2018. Does credit reporting lead to a decline in relationship lending? Evidence from information sharing technology. Journal of Accounting and Economics 66, 123–141.

Sutherland, A., 2020. Technology is changing lending: Implications for research. Journal of Accounting and Economics 70, 101361.

Vashishtha, R., 2014. The role of bank monitoring in borrowers' discretionary disclosure: Evidence from covenant violations. Journal of Accounting and Economics 57, 176–195.

Vatter, W. J., 1966. Accounting for leases. Journal of Accounting Research 4, 133–148.

Watts, R. L., Zimmerman, J. L., 1978. Towards a Positive Theory of the Determination of Accounting Standards. The Accounting Review 53, 112–134.

Watts, R. L., Zimmerman, J. L., 1990. Positive Accounting Theory: A Ten Year Perspective. The Accounting Review 65, 131–156.

Wilkins, T., Zimmer, I., 1983. The Effect of Leasing and Different Methods of Accounting for Leases on Credit Evaluations. The Accounting Review 58, 749–764.

Williamson, O. E., 1979. Transaction-Cost Economics: The Governance of Contractual Relations. Journal of Law & Economics 22, 233–261.

Appendix A: Example of a Contingent-Payment Lease
This appendix includes excerpts from a 2015 commercial real estate lease contract between Fertitta Hospitality, LLC ("Landlord") and the Rainforest Cafe ("Tenant").

3.1 Base Rent. The base rent to be paid by Tenant for the Leased Premises (the "Base Rent") shall be $96,000 per year, which shall be due and payable by Tenant to Landlord in equal monthly installments on or before the first day of the first month following the Commencement Date, and thereafter on or before the first day of each month, in advance, at Landlord's address set out under Section 1.1(f) above, or at such other place as Landlord may designate to Tenant, in writing, without setoff or deduction except the Percentage Rent in Section 3.2.

3.2 Percentage Rent. Tenant shall pay to Landlord monthly Percentage Rent in excess of the monthly Base Rent for each calendar month during which Tenant occupies the Leased Premises. Each monthly installment of Percentage Rent throughout the term shall be equal to a certain percentage of Gross Sales, as that term is hereinafter defined, during the month immediately prior to the month in which such installment becomes due, less the monthly Base Rent. Tenant shall provide Landlord with a report of Gross Sales on a monthly basis in a manner to be designated by Landlord. The percentage for calculating monthly installments of Percentage Rent shall be equal to the percentage attributable to the following table to the level of Gross Sales.

Percentage (%)	Gross Sales
4%	$0–$4,000,000.00
5%	$4,000,000.01–$6,000,000.00*
6%	$6,000,000.01 and above*

Within ten (10) days after the end of each calendar month of the Term and Renewal Term, if applicable, Tenant shall furnish to Landlord a statement in writing certified by an executive officer of Tenant to be correct, showing the total Gross Sales made in, upon, or from the Leased Premises during the preceding calendar month, and shall accompany each such statement with a payment to Landlord equal to the Percentage Rent, if any, due with respect to said month.

3.3 Definition of Gross Sales. "Gross Sales" shall mean the entire amount of the sales prices of all goods and merchandise sold (including gift and merchandise certificates when redeemed), and the charges for all services and all other receipts in, on or from any part of the Leased Premises, whether for cash or credit, and shall include telephone orders received or filled at the Leased Premises, orders taken from the Leased Premises, although the orders may be filled elsewhere, and all monies or other things of value which Tenant is entitled to receive from food and beverage sales from the Leased Premises. The following shall be deducted or excluded, as the case may be, from Gross Sales: (a) refunds to customers; (b) sales, use, excise, retailer's, occupation, alcoholic beverage or similar taxes imposed in a specific amount, or percentage upon, or determined by, the amount of sales if actually paid to the taxing authority; (c) returns to shippers and manufacturers; (d) sales not in the ordinary course of Tenant's business, or machinery, furnishings or equipment which Tenant removes from the Leased Premises; and (e) the value of any exchange or transfer of merchandise between stores of Tenant if it is made solely for the convenient operation of Tenant's business and not for consummating a sale made at the Leased Premises.

Appendix B
Variable Construction

This appendix describes all the variables in this study and their sources. Index i represents each lease. Data source CS = CompStak.

Variable	Definition	Source
Contingent-Payment Lease$_i$	An indicator variable that equals one if a lease contract specifies a lease payment stated in terms of a percentage of the tenant's monthly sales, zero otherwise, as specified in the lease contract	CS
Fixed Price per Square Foot$_i$	The fixed price per square foot of the leased property in dollar terms, as specified in the lease contract (stated in annual terms, not monthly)	CS
Lease Duration$_i$	The number of months between the date the lease commences to the date of expiration, as specified in the lease contract	CS
Tenant Receives Audit$_i$	An indicator variable that equals one if a tenant receives a financial statement audit, zero otherwise. Note that CompStak does not provide granular detail regarding the audit firm or cost of the audit	CS
Geographical Separation$_i$	Distance in miles between the leased property's address and the landlord's headquarters, as specified in the lease contract	CS
Tenant's # Establishments$_i$	The total number of unique properties leased by the tenant in the CompStak data	CS
Total Square Footage$_i$	Total number of square feet leased, as specified in the lease contract	CS
Property Improvements$_i$	An indicator variable that equals one if a lease specifies that the lessor must perform property improvements, zero otherwise	CS
Landlord Sophistication$_i$	An indicator variable that equals one if a landlord's total number of leases in the years leading up to and including the year the lease commences is in the top tercile of the sample, zero otherwise. This variable is recomputed for every year of the sample	CS
Landlord Owns Property$_i$	An indicator variable that equals one if a landlord owns the leased property, zero if the landlord has financed the leased property	CS
Tenant Default$_i$	An indicator variable that equals one if a tenant defaults on the lease, where default is defined as any incidence of a lease payment being delinquent by 30 days or more, zero otherwise, as reported by CompStak	CS

Table 1
Sample Selection for Commercial Real Estate Lease Contracts from CompStak from 2012 to 2020
This table reports the sample selection process. I begin with all commercial real estate leases in CompStak from January 1, 2012 to March 31, 2020.

	Number of Leases in CompStak
All commercial real estate leases	535,402
Less: Industrial real estate leases (fixed lease payment only)	(110,369)
Less: Office real estate leases (fixed lease payment only)	(317,107)
Retail real estate leases	107,926

Table 2
Year Distribution of Retail Commercial Real Estate Lease Contracts from 2012 to 2020
This table reports the year distribution of the sample of lease contracts based on the year when the lease commences.

Year	# of Leases	% of Sample
2012	8,653	8.02
2013	9,639	8.93
2014	9,184	8.51
2015	10,601	9.82
2016	12,570	11.65
2017	15,000	13.90
2018	15,462	14.33
2019	17,149	15.89
2020	9,668	8.96
Total	107,926	100.00

Table 3
State Distribution of Retail Commercial Real Estate Lease Contracts from 2012 to 2020
This table reports the top 20 states in the sample with the most lease contracts, based on the state of the leased property.

State	# of Leases	% of Sample
CA	26,773	24.81
TX	11,695	10.84
NY	11,325	10.49
FL	4,556	4.22
UT	3,625	3.36
AZ	3,267	3.03
IL	2,949	2.73
GA	2,934	2.72
NC	2,920	2.71
NV	2,477	2.30
OH	2,303	2.13
PA	2,117	1.96
NJ	2,006	1.86
WA	1,956	1.81
VA	1,897	1.76
TN	1,873	1.74
MO	1,825	1.69
MI	1,779	1.65
CO	1,740	1.61
OR	1,721	1.59

Table 4
Market Distribution of Retail Commercial Real Estate Lease Contracts from 2012 to 2020
This table reports the top 20 metropolitan statistical areas (MSAs) in the sample with the most lease contracts, based on the MSA of the leased property.

MSA	# of Leases	% of Sample
Los Angeles - Orange - Inland	11,365	10.53
New York City	9,892	9.17
Bay Area	7,156	6.63
Dallas - Ft. Worth	4,371	4.05
Sacramento - Central Valley	3,799	3.52
Salt Lake City	3,332	3.09
Houston	2,719	2.52
Phoenix	2,648	2.45
Chicago Metro	2,645	2.45
San Diego	2,440	2.26
Las Vegas	2,335	2.16
Atlanta	2,316	2.15
Philadelphia - Central PA - DE - So. NJ	1,823	1.69
Washington, DC	1,818	1.68
North Carolina - Other	1,652	1.53
Denver	1,646	1.53
New Jersey - North and Central	1,601	1.48
Miami - Ft. Lauderdale	1,590	1.47
Texas - Other	1,556	1.44
Portland Metro	1,545	1.43

Table 5
Tenant Industry Distribution of Retail Commercial Real Estate Lease Contracts from 2012 to 2020
This table reports the tenant's primary industry, as reported by CompStak.

Tenant Industry	# of Leases	% of Sample
Food & Beverage	19,965	18.50
Retail	12,132	11.24
Apparel	8,787	8.14
Leisure & Restaurants	6,626	6.14
Health Care Equipment & Services	5,448	5.05
Consumer Durables	4,259	3.95
Education	2,776	2.57
Media	2,463	2.28
Automobiles & Components	2,459	2.28
Banks	2,299	2.13
Telecommunication Services	1,833	1.70
Legal Services	1,489	1.38
Real Estate	1,289	1.19
Financial Services	1,261	1.17
Non-Profit	1,164	1.08
Transportation, Warehousing & Storage	1,057	0.98
Insurance	908	0.84
Commercial & Professional Service	862	0.80
Materials	779	0.72
Public Institutions	584	0.54
Software & Information	537	0.50
Pharmaceuticals, Biotechnology & Life Sciences	420	0.39
Energy	366	0.34
Capital Goods	196	0.18
Utilities	159	0.15
Technology Hardware & Equipment	26	0.02
Unlisted	27,782	25.74
Total	107,926	100.00

Table 6

Descriptive Statistics for Retail Commercial Real Estate Lease Contracts from 2012 to 2020

This table reports the descriptive statistics for the variables used in all of the analyses. Index i represents each lease. The continuous variables are winsorized at the 1% and 99% levels unless a variable has a natural lower bound of zero, in which case it is winsorized from the top only. All inferences are similar when I do not winsorize.

Variable	N	Mean	σ	P25	P50	P75
Contingent-Payment Lease$_i$	107,926	0.27	0.45	0.00	0.00	1.00
Fixed Price per Square Foot$_i$	107,926	32.33	27.35	15.00	24.00	37.16
Lease Duration$_i$	107,926	80.56	47.53	50.00	60.00	120.00
Tenant Receives Audit$_i$	107,926	0.24	0.42	0.00	0.00	0.00
Geographical Separation$_i$	107,926	503.14	1218.21	28.43	610.31	1531.92
Tenant's # Establishments$_i$	107,926	26.34	61.86	1.00	2.00	8.00
Total Square Footage$_i$	107,926	3913.84	4458.32	1285.00	2102.00	4200.00
Property Improvements$_i$	107,926	0.12	0.33	0.00	0.00	0.00
Landlord Sophistication$_i$	107,926	0.40	0.49	0.00	0.00	1.00
Landlord Owns Property$_i$	107,926	0.65	0.48	0.00	1.00	1.00
Tenant Default$_i$	107,926	0.04	0.20	0.00	0.00	0.00

Table 7

Contingent-Payment Leases Partitioned on Lease Duration and Price per Square Foot from 2012 to 2020

This table partitions the full sample of leases by the lease duration (in months) and the price per square foot (PSF), as reported in the lease contract.

Panel A: Contingent-payment leases and lease duration partitions

	Lease Term (in months)									
	<6	6-12	13-24	25-36	37-48	49-60	61-96	97-120	>120	Total
Total leases	588	5,439	5,012	12,081	3,742	32,609	10,205	23,262	14,988	107,926
Contingent-payment leases	37%	35%	37%	33%	30%	23%	28%	26%	25%	27%

Panel B: Contingent-payment leases and price per square foot (PSF) partitions

Price per square foot (PSF)	Total leases	Contingent-payment leases
PSF <= $10	9,755	35%
$10 < PSF <= $15	17,849	32%
$15 < PSF <= $20	16,366	31%
$20 < PSF <= $25	15,563	31%
$25 < PSF <= $30	11,376	27%
$30 < PSF <= $40	13,507	23%
$40 < PSF <= $50	7,467	16%
$50 < PSF <= $60	4,090	18%
$60 < PSF <= $70	2,082	21%
PSF > $70	9,871	18%
Total	107,926	27%

Table 8

Determinants of Contingent-Payment Lease Contracts for Retail Commercial Real Estate Leases from 2012 to 2020

This table reports linear probability models of the probability that a lease is contingent-payment. Index i represents the lease and the corresponding landlord and tenant. Contingent-Payment Lease$_i$is an indicator variable that equals one if a lease contract specifies a lease payment stated in terms of a percentage of the tenant's monthly sales, and zero otherwise. "MSA" stands for Metropolitan Statistical Area, as reported in Table 4. Variables are increased by 1 before being natural logged. See Appendix B for the exact variable definitions. Standard errors are in parentheses and robust to heteroskedasticity. ***, **, and * indicate statistical significance at the two-tailed 1%, 5%, and 10% levels, respectively.

	Dependent Variable: Contingent-Payment Lease$_i$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tenant Receives Audit$_i$	0.065***							0.073***
	(0.009)							(0.000)
Log(Geographical Separation$_i$)		-0.020***						-0.003***
		(0.000)						(0.000)
Log(Tenant's # Establishments$_i$)			-0.002***					-0.002**
			(0.000)					(0.001)
Log(Total Square Footage$_i$)				0.013***				0.014***
				(0.004)				(0.003)
Property Improvements$_i$					-0.005			-0.003*
					(0.004)			(0.002)
Landlord Sophistication$_i$						0.023***		0.022***
						(0.005)		(0.004)
Landlord Owns Property$_i$							0.054***	0.055***
							(0.008)	(0.008)
Year-Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Tenant Industry-Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
MSA-Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Observations	107,926	107,926	107,926	107,926	107,926	107,926	107,926	107,926
R^2	0.26	0.23	0.22	0.23	0.24	0.25	0.24	0.32

Table 9

Determinants of Lease Contract Outcomes for Retail Commercial Real Estate Leases from 2012 to 2020

This table reports linear probability models of the probability that a tenant goes into default on a lease, where default is defined in the data as any incidence of a lease payment being delinquent by 30 days or more. Index i represents the lease and the corresponding landlord and tenant. Contingent-Payment Lease$_i$is an indicator variable that equals one if a lease contract specifies a lease payment stated in terms of a percentage of the tenant's monthly sales, and zero otherwise. "MSA" stands for Metropolitan Statistical Area, as reported in Table 4. Variables are increased by 1 before being natural logged. See Appendix B for the exact variable definitions. Standard errors are in parentheses and robust to heteroskedasticity. ***, **, and * indicate statistical significance at the two-tailed 1%, 5%, and 10% levels, respectively.

	Dependent Variable: Tenant Default$_i$										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Contingent-Payment Lease$_i$	-0.012***										-0.013***
	(0.003)										(0.003)
Log(Fixed Price per Square Foot$_i$)		-0.005**									-0.005***
		(0.002)									(0.001)
Lease Duration$_i$			-0.004**								-0.003**
			(0.002)								(0.002)
Tenant Receives Audit$_i$				-0.003**							-0.004**
				(0.002)							(0.002)
Log(Geographical Separation$_i$)					0.004**						0.005***
					(0.002)						(0.001)
Log(Tenant's # Establishments$_i$)						-0.006***					-0.005***
						(0.001)					(0.000)
Log(Total Square Footage$_i$)							-0.005**				-0.006**
							(0.003)				(0.003)
Property Improvements$_i$								0.001			0.001
								(0.005)			(0.002)
Landlord Sophistication$_i$									-0.009**		-0.008**
									(0.004)		(0.004)
Landlord Owns Property$_i$										-0.003**	-0.004**
										(0.002)	(0.002)
Year-Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Tenant Industry-Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
MSA-Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	107,926	107,926	107,926	107,926	107,926	107,926	107,926	107,926	107,926	107,926	107,926
R^2	0.36	0.34	0.33	0.33	0.32	0.35	0.32	0.32	0.33	0.33	0.39