Beyond the Balance Sheet

The first systematic evidence on variable lease adoption among European listed firms under IFRS 16

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Abstract

IFRS 16 *Leases*, effective January 2019, eliminated off-balance-sheet treatment for most lease obligations. However, variable lease payments linked to future performance or usage remain excluded from the lease liability, preserving an avenue for off-balance-sheet exposure. Using hand-collected data from a random sample of 251 European public firms spanning 2019-2024, this study provides the first systematic evidence on variable lease adoption in the IFRS setting. We document that approximately 30% of firms report variable lease expenses in any given year, and for those firms, they increase relative to capitalised lease expenses over time. We then examine whether adoption reflects reporting or operational incentives. Leverage, our main proxy for incentives, does not independently or as a moderator of lease intensity show a robust association with variable lease adoption. An exploratory cash-based analysis, however, finds that cash constraints amplify the effect of lease intensity, a pattern that persists among heavy-adopters. Overall, the results are more consistent with an operational financial-constraints channel rather than a reporting incentives channel. Finally, we find that variable lease expenses exhibit similar persistence and predictability to capitalised lease expenses, undermining the IASB's measurement reliability rationale for their exclusion. Estimated variable lease liabilities would raise debt by 2.8% on average, reaching 6.3% in Southern Europe.

Keywords: IFRS 16; Lease Accounting; Variable Leases; Off-balance-sheet Leases; Accounting Choice

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1. Introduction

For decades, investors, regulators, and academics criticised the inconsistent accounting treatment of leases, which permitted firms to keep operating leases off-balance-sheet ("OBS") while recognising finance leases as assets and liabilities. This asymmetry gave rise to concerns that firms structured lease contracts to achieve favourable financial reporting outcomes rather than to reflect economic substance (Imhoff & Thomas, 1988; Dechow et al., 2011). In response, the International Accounting Standards Board ("IASB") issued IFRS 16 *Leases*, effective 1 January 2019, eliminating the distinction between operating and finance leases for lessees. Instead, nearly all lease obligations are required to be recognised on the balance sheet through a right-of-use ("ROU") asset and corresponding lease liability. The reform represented a landmark shift in financial reporting, bringing up to $3 trillion in OBS commitments onto corporate balance sheets worldwide (IASB, 2016b).[1] However, IFRS 16 did not close all avenues for off-balance-sheet treatment ("OBS-16"). Among the remaining exemptions, variable lease expenses linked to future performance or usage of the underlying asset, such as payments tied to revenue, output, or machine hours, are excluded from the measurement of the lease liability and instead recognised as expenses when incurred. The IASB justified this exclusion in part on measurement reliability grounds, reasoning that such payments are difficult to estimate as they depend on future outcomes (IASB, 2016c). This carve-out creates continued scope for firms to maintain lease-related obligations OBS-16, raising the question of whether IFRS 16 has fully achieved its transparency objective.

Evidence from the parallel U.S. standard ASC 842 suggests that this exclusion may carry unintended effects. Yoon (2021) documents that less-leveraged firms shifted toward short-term and variable structures following ASC 842 adoption. Heese et al. (2025) show that variable lease expenses under ASC 842 demonstrate persistence and predictability comparable to on-balance-sheet operating lease expenses, while exhibiting limited revenue sensitivity, properties that challenge the assumptions underlying their exclusion. Whether these findings extend to IFRS 16, which differs from ASC 842 in its single lease accounting model, remains an open empirical question. The IASB's ongoing Post-implementation Review, which solicits feedback on the treatment of variable lease payments (IASB, 2025b), underscores the timeliness of this inquiry.

This study examines variable lease payments under IFRS 16 using hand-collected data from a random sample of 251 European public firms (1,446 firm-year observations, 2019-2024). This provides the first systematic empirical documentation of variable lease adoption over time among IFRS preparers. Our analysis proceeds around two pillars. First, we examine what drives variable lease adoption through competing theoretical lenses. On the one hand, positive accounting theory ("PAT") (Watts & Zimmerman,

[1] Includes listed companies using IFRS or U.S. GAAP disclosure.

1990) predicts that leverage strengthens the association between lease intensity and variable lease adoption through debt covenant pressure. On the other hand, the operational dominance view (Yoon, 2021) suggests that leverage weakens this association as highly leveraged firms are operationally dependent on leasing and less concerned with reporting effects. We further examine heavy-adopters, firms in the top quartile of variable lease intensity, to assess whether the full-sample patterns are concentrated among more deliberate lease structurers. Second, we test whether the IASB's measurement reliability rationale holds empirically by extending the analyses of Heese et al. (2025) to IFRS 16. We examine persistence, predictability, and revenue sensitivity of variable leases relative to other lease categories and construct estimated variable lease liabilities.

Our findings are as follows. Variable lease payments are prevalent, adopted by circa 30% of sample firms. Although the share of preparers adopting variable leases does not exhibit a clear trend, firms' relative adoption of them compared to on-balance-sheet leases appears to increase over time. Furthermore, neither leverage nor its interaction with lease intensity yields a robust association with variable leases, providing no consistent support for either hypothesis on lease structuring incentives. In an exploratory analysis of a cash-based mechanism, we find that the interaction between cash constraints and lease intensity is positively associated with variable lease intensity, a pattern that persists among heavy-adopters. Our results point toward operational financial constraints rather than reporting incentives as a driver of variable lease structuring, consistent with Caskey and Ozel's (2019) finding that non-reporting incentives dominate OBS leasing decisions. Turning to measurement reliability and recognition, we find that variable leases exhibit persistence comparable to those of capitalised lease expenses, challenging the IASB's rationale for excluding them on measurement uncertainty grounds. They do, however, track business activity more closely, exhibiting greater sensitivity to revenue changes. When extended to the balance sheet, variable leases would raise reported debt by 2.8% in the average firm, reaching 6.3% in Southern Europe.

This study contributes to the literature in three ways. First, we provide the first systematic evidence on the adoption of variable lease payments in the European IFRS setting, documenting their growing relative importance. Second, we contribute to the literature on accounting choice and lease design by examining whether reporting incentives, as formalised in PAT, or operational factors, are linked to the adoption of variable lease structures. Third, we extend the analysis of Heese et al. (2025) to IFRS 16, testing whether variable lease expenses exhibit properties consistent with the IASB's motivation for excluding them from lease liability measurement.

The remainder of this paper is organised as follows. Section 2 provides institutional background on IFRS 16 and the treatment of variable lease payments. Section 3 reviews the related literature and develops our theoretical framework. Section 4 presents the hypothesis development. Section 5 describes our research design, sample selection, and empirical methods. Section 6 reports the findings. Section 7 concludes.

2. Background

2.1. The International Financial Reporting Standards

International Financial Reporting Standards ("IFRS") are a set of internationally used accounting standards designed to improve the transparency and comparability of financial reporting across countries and capital markets. The standards are developed and issued by the IASB, an independent standard-setting body operating under the oversight of the IFRS Foundation. The development of IFRS can be traced back to the establishment of the International Accounting Standards Committee ("IASC") in 1973. The IASC was formed by professional accounting bodies from several countries with the aim of developing internationally accepted accounting standards and promoting their global adoption. Between 1973 and 2001, the IASC issued a series of International Accounting Standards ("IAS"). In 2001, the organisation was replaced by the IASB, which assumed responsibility for international standard setting and continued the development of existing IAS while issuing new standards under the name IFRS (IFRS Foundation, n.d.).

The importance of IFRS increased significantly with their adoption in the European Union. In 2002, the EU introduced legislation requiring all companies listed on regulated securities markets within the EU to prepare their consolidated financial statements in accordance with IFRS from 2005 onwards. This transition led 7,000 companies across 25 European countries to switch to IFRS (IFRS Foundation, n.d.).

2.2. Lease Accounting

2.2.1. IAS 17

Prior to the introduction of IFRS 16, lease accounting for lessees was governed by IAS 17 *Leases*, which classified leases into two categories: finance leases and operating leases. A finance lease was defined as a lease arrangement that transferred substantially all the risks and rewards incidental to ownership to the lessee. In practice, this assessment depended on the economic substance of the transaction rather than its legal form. IAS 17 also provided several indicators of a finance lease, including situations in which ownership of the asset transferred to the lessee at the end of the lease term or the present value of minimum lease payments amounted to at least substantially all the asset's fair value. Where the criteria for a finance lease were met, both the underlying asset and a corresponding liability were recognised on the lessee's balance sheet at the commencement of the lease term. Subsequently, the asset was depreciated over the shorter of the lease term and its useful life, while the lease liability was reduced over time

as lease payments were made.[2] The finance charge was allocated over the lease term to produce a constant periodic rate of interest on the outstanding liability (IASB, n.d.).

In contrast, leases that did not meet the definition of a finance lease were classified as operating leases. For these leases, the lessee did not recognise either the underlying asset or the related lease obligation on the balance sheet, resulting in OBS treatment. Instead, lease payments were recognised as an expense in the income statement, typically on a straight-line basis over the lease term. Future minimum payment commitments under operating leases were disclosed in the footnotes to the financial statements (IASB, n.d.).

The distinction between finance and operating leases under IAS 17 was widely criticised by investors, analysts, and regulators. Because classification relied on broad principles and judgement-based criteria, economically similar lease arrangements could be reported differently across firms. This reduced comparability and allowed substantial lease obligations to remain OBS. As a result, users of financial statements often adjusted reported figures to estimate firms' lease-related assets, liabilities, and leverage more accurately. The IASB identified these concerns as a central weakness of IAS 17 and as a key reason for replacing it with a new standard (IASB, 2016b; Lloyd, 2016).

2.2.2. IFRS 16

In response to the shortcomings of IAS 17, the IASB and the U.S. Financial Accounting Standards Board ("FASB") initiated a joint lease accounting project in 2006 (FASB, 2025; IASB, 2016c). Following discussion papers, exposure drafts, and stakeholder consultations, the IASB issued IFRS 16 *Leases* in January 2016, with a mandatory effective date of 1 January 2019. The objective of the new standard was to improve the recognition, measurement, presentation, and disclosure of lease transactions, particularly by reducing the extent of OBS lease accounting and thereby enhancing the transparency and comparability of financial reporting (IASB, 2016c).

The central change introduced by IFRS 16 was the removal of the distinction between operating and finance leases for lessees. Instead, the standard introduced a single lease accounting model under which lessees are required to recognise a ROU asset and a corresponding lease liability. Initial measurement of the lease liability is based on the present value of lease payments, discounted using the interest rate implicit in the lease if it can be readily determined. If not, the lessee uses its incremental borrowing rate. The ROU asset is initially measured at an amount equal to the lease liability, adjusted for items such as lease payments made at or before commencement, initial direct costs, and restoration obligations. Subsequently, the lease liability is increased by interest charged

[2] Under both standards, if there is/was reasonable certainty that ownership of the asset will/would transfer to the lessee at the end of the lease term, depreciation is/was instead based on the asset's expected useful life (IASB, n.d.; IASB, 2016a).

and reduced by lease payments made, while the ROU asset is depreciated over the shorter of the lease term and the useful life of the underlying asset (IASB, 2016a).[2]

IFRS 16 includes three recognition exemptions under which lessees can elect not to recognise a ROU asset and a corresponding liability. Payments relating to such leases are instead recognised as expenses over the lease term. These exemptions were introduced, among other considerations, for cost-benefit reasons and mean that not all lease commitments are recognised on the balance sheet even under IFRS 16 (IASB, 2016c). The first exemption is short-term leases, defined as leases with a term of 12 months or less. The second covers leases of low-value underlying assets. The third concerns variable leases. These payments occupy a particular position under IFRS 16, as not all are treated in the same way for measurement purposes. The standard distinguishes between variable lease payments that depend on an index or rate, and those that depend on future performance or usage of the underlying asset. This distinction is important as it determines whether the payment is included in the lease liability or recognised as an expense in the income statement. Variable lease payments that depend on an index or rate, such as a consumer price index or a benchmark interest rate, are included in the initial measurement of the lease liability using the index or rate applicable at the commencement date. If the index or rate changes after initial recognition, the lease liability is remeasured accordingly. In contrast, variable lease payments that depend on future performance or usage of the underlying asset are excluded from the initial measurement of the lease liability. This category includes, for example, payments based on revenue, output, or machine hours. Such payments are instead recognised in the income statement in the period in which the event or activity triggering the payment occurs. Additionally, the standard refers to so-called in-substance fixed payments, which are payments that may appear variable in form but are, in economic substance, unavoidable. Where this is the case, the payments are included in the measurement of the lease liability (IASB, 2016a). The distinction between fixed payments, in-substance fixed payments, and variable payments linked to performance or usage is therefore central to the application of IFRS 16. It affects both the amount recognised on the balance sheet and whether lease-related expenses are reflected through ROU asset depreciation and lease interest expense or through operating expenses in the income statement. Unless otherwise stated, all references to variable leases hereinafter refer to variable lease payments not included in the measurement of the lease liability.

2.2.3. Comparison of ASC Topic 842 and IFRS 16

After initiating the joint lease accounting project, aiming to develop a harmonised approach to lease reporting, the IASB and FASB were ultimately unable to achieve full convergence. While both boards agreed that most leases should be recognised on the balance sheet, they reached different conclusions regarding lease classification (FASB, 2025). This resulted in the publication of two separate standards in 2016: IFRS 16 *Leases*, issued by the IASB, and Accounting Standards Update 2016-02, which introduced ASC

Topic 842 Leases under U.S. GAAP in February 2016. In contrast to the single accounting model under IFRS 16, ASC 842 retains a dual model for lessees, distinguishing between finance leases and operating leases. Although both types of leases are recognised on the balance sheet, the expense recognition differs. Finance leases are treated in a similar manner to capitalised leases under IFRS 16, with a separate ROU asset amortisation and interest expense on the lease liability. By contrast, operating leases are presented as a single straight-line lease expense. The liability is still unwound using the same effective interest method, but ROU asset amortisation acts as a balancing figure to arrive at the straight-line lease expense. Because lease interest expense is front-loaded over the lease term, the amortisation charge on an operating lease ROU asset is implicitly back-loaded, meaning that in the earlier years it amortises at a slower pace than under a finance lease. Because operating leases under ASC 842 are recognised as lease expenses rather than as amortisation, EBITDA is generally higher for IFRS 16 reporters. In practice, this means that IFRS 16 and U.S. GAAP broadly produce similar balance sheet recognition, but different income statement effects and expense patterns over time. Additionally, the standards diverge in their treatment of index- or rate-linked variable payments. Under ASC 842, such payments are embedded in the lease liability, but subsequent measurement changes usually flow through the variable lease expense line. Under IFRS 16, measurement changes trigger re-measurement of the lease liability, flowing through ROU depreciation and lease interest. Finally, IFRS 16 includes a low-value asset exemption that has no direct equivalent under ASC 842 (FASB, 2016; KPMG, 2025; IASB, 2016b).

2.2.4. Post-implementation Review of IFRS 16

Since taking effect, IFRS 16 has undergone ongoing evaluation. As part of its Post-implementation Review, the IASB published a Request for Information in 2025 to assess if the standard is operating as intended and whether unexpected implementation challenges have arisen. Feedback from the review process indicates that variable leases remain an area of practical difficulty. Respondents highlighted challenges in distinguishing between payments that depend on an index or rate, payments linked to future performance or usage, and in-substance fixed payments. Users of financial statements also expressed concerns that disclosures do not always clearly distinguish between different types of variable leases (IASB, 2025b), making it difficult to assess the extent to which lease-related obligations are reflected on the balance sheet. Similarly, concern has arisen about entities failing altogether to disclose expenses related to OBS-16 variable leases (ICAEW, 2025). Figures A1-A3 illustrate how disclosure practices on variable leases can differ between firms. The implementation challenges suggest that the separation between on-balance and OBS-16 variable lease payments may be unclear in practice, raising questions about the potential for lease structuring. Indeed, the IASB considered whether IFRS 16 could incentivise firms to structure leases as variable to achieve desired accounting outcomes, and if the exemption could yield less comparable accounting for economically similar contracts (IASB, 2016b).

3. Literature Review

3.1. The OBS Era

The question of why firms lease and how they structure lease arrangements has long attracted scholarly attention, with the periods before IFRS 16 and ASC 842 offering a particularly interesting setting given the substantial scope for OBS leasing. Eisfeldt and Rampini (2009) argue that leasing is attractive because a lessor's repossession rights enable greater debt capacity than secured lending, making it valuable to financially constrained firms seeking to "preserve capital". Consistent with this, they find that size as well as dividends and cash flows scaled by assets are negatively associated with leasing, implying that firms with greater internal funds lease less. Relatedly, Caskey and Ozel (2019) distinguish between two types of incentives for OBS operating leasing. The first type is non-reporting incentives, summarised as expanding financial capacity, maximising tax deductions, and accommodating volatile capacity needs through more flexible commitments. The second type is reporting incentives relating to capital markets, contracting, and regulation. Studying U.S. firms between 1990 and 2016, the authors find that operating lease adoption is positively associated with financial risk and operational volatility, while being negatively associated with size, profit margin, and marginal tax rates. Crucially, finding no robust evidence that reporting incentives explain operating lease decisions, they conclude that non-reporting motives are the primary driver.

In contrast, a parallel strand of literature documents the adoption of OBS leases as an earnings management tool. Imhoff and Thomas (1988) show that when SFAS No. 13 put capital leases on the balance sheet, firms systematically restructured towards operating leases. The response was most pronounced among firms with larger pre-adoption capital lease exposure, consistent with them facing the greatest potential financial statement impact from the standard. Drawing on contracting theory, they argue that the cost of renegotiating contracts into operating leases was outweighed by the economic benefits derived from OBS leasing. Extending this, Imhoff et al. (1991) construct estimates of the unrecorded balance-sheet impact of operating leases. They find that return-on-assets ("ROA") would fall by 10% and 34%, and debt-to-equity would rise by 47% and 191%, for low- and heavy-lease firms, respectively. Thus, the authors suggest that OBS operating leases had a material impact on key financial ratios and cross-sectional comparability. Cornaggia et al. (2013) further show that OBS lease obligations materially reduced reported leverage ratios and overstated firm performance under ASC 840. Dechow et al. (2011) provide related evidence, finding that firms committing accounting misstatements adopted operating leases more intensively across misstatement years. The authors interpret this pattern as evidence that firms exploit accounting discretion as a "legal" form of earnings management, before engaging in more material misstatement.

3.2. Academic Research on IFRS 16

Since its introduction, academic research on IFRS 16 has broadly fallen into three strands: (i) the implementation effects on the financial statements, (ii) the usefulness of the standard for users, and (iii) the real effects on firm behaviour (IASB, 2025a).

Within the first strand, Lopes and Penela (2025) show that the transition has led to significant changes in balance sheet structures and liquidity ratios. The authors interpret this as evidence that operating leases were not adequately captured under IAS 17, and that the new standard has improved transparency. Bradbury (2024, as cited in IASB, 2025a) finds that analyst adjustments based on IAS 17 footnotes, compared with IFRS 16 reported figures, understated the impact of leases on the balance sheet and financial ratios.[3] However, Onie et al. (2023) note that the magnitude of financial statement impacts appears concentrated in lease-heavy sectors, particularly where leasing of land and buildings is more prevalent. Finding that most OBS lease activity was confined to a relatively small number of firms within a few sectors, the authors raise concerns about whether the benefits of IFRS 16 outweigh the compliance costs imposed on all firms.

The second strand examines the usefulness of lease-related information for decision-making. Onie et al. (2024) find that recognised lease assets and liabilities became value relevant for all firms under IFRS 16, whereas this was limited to firms with smaller lease exposures under IAS 17. Consequently, the standard appears to have played a role in harmonising how the market prices earnings and book values across lease intensities. Similarly, analysts' forecast accuracy has improved, with disagreement among analysts declining particularly for lease-intensive firms (Hanlon et al., 2024, as cited in IASB, 2025a). Loan spreads also declined for IFRS reporters compared to Japanese GAAP adopters upon introduction, implying that lenders perceived lower information risk under IFRS 16. Within the IFRS sample, the reduction was larger for firms with lower operating lease exposure, potentially due to lenders perceiving those firms to have weaker incentives to adopt short-term leases to maintain OBS-16 treatment (Kusano & Yamashita, 2024, as cited in IASB, 2025a). Overall, users report that the standard has improved the usefulness of financial reporting, though uncertainty remains about whether disclosures fully capture all material lease-related information (Davern et al., 2020).

The third strand focuses on preparers' behavioural responses to the standard. Onie (2025) examines the actions Australian adopters took between 2012 and 2018 in anticipation of mandatory application. While expecting high-lease firms to drive reductions in new operating lease commitments following the standard's issuance, the author finds that the effect was less pronounced among these firms. The author attributes this to high-lease firms either facing limited opportunity to reduce leasing due to long-term operational

[3] Bradbury (2024), Onie et al. (2023; 2024), and Onie (2025) study firms under the Australian Accounting Standard AASB 16 *Leases*, which imposes the same requirements as IFRS 16 for public entities (IASB, 2025a).

commitments or having greater ability to renegotiate debt contracts to accommodate the additional recognised liabilities. Nevertheless, heavy lessees increased capital expenditure relative to their pre-issuance behaviour and low-lease firms, suggesting a shift toward asset ownership, perhaps to reduce reported lease liabilities.

3.3. Lease Restructuring and Variable Lease Adoption under ASC 842

The research presented in Section 3.2 indicates that IFRS 16 has improved transparency, comparability, and usefulness of lease accounting. However, academic evidence on the remaining IFRS 16 lease capitalisation exemptions is limited, particularly with respect to variable lease expenses. This study therefore draws on U.S. evidence under ASC 842 to shed light on the real effects of lease capitalisation in a setting where variable payments receive broadly similar accounting treatment.

Upon the introduction of ASC 842, critics warned against the continued exemption of short-term leases, arguing it could perpetuate OBS financing (Comiran et al., 2022). Christensen et al. (2025) find that firms most sensitive to leverage-related financing costs decreased the duration of their minimum lease payments for new operating leases by 22% in response to ASC 842. The authors interpret this as a possible strategic restructuring of contracts toward shorter terms and more variable payments to achieve desired reporting outcomes. Comiran et al. (2022) offer a more nuanced picture. On the one hand, they find that timely disclosure about the expected balance-sheet impact of ASC 842 was positively associated with operating lease activity, which they argue is consistent with non-reporting incentives. On the other hand, they document a 22.6% reduction in operating lease reliance between 2008 and 2017, in contrast to the 745% increase recorded between 1980 and 2007. The authors attribute this reversal to firms anticipating capitalisation requirements after ASC 842 was added to the FASB's agenda. They also note that firms with the largest operating lease reductions made more frequent disclosure references to short-term leases, suggesting that these firms more actively sought to avoid capitalisation by shifting towards an exempt lease category.

Yoon (2021) substantiates these findings, showing that ASC 842 adoption prompted a significant reduction in operating leases and a systematic shift toward short-term and variable leases. The author's interpretation is that managers previously exploited a perceived failure of financial statement users to fully process operating lease footnote disclosures. However, ASC 842 removed this reporting benefit by bringing them onto the balance sheet, thus creating a shift toward other lease structures. In terms of attributes, similar to earlier evidence from Imhoff and Thomas (1988), the substitution effect was strongest among firms with high pre-adoption lease intensity. Furthermore, less-leveraged firms drove the effect, which Yoon (2021) attributes to a greater sensitivity to the incremental balance-sheet impact of lease capitalisation. Consistent with this, using the debt-to-equity ratio, the author shows that reducing operating leases generates material reductions in reported leverage, especially among firms with lower existing debt

levels. Thus, the author argues that low-leverage firms have more to gain from OBS treatment and are therefore more likely to alter leasing decisions for reporting reasons. By contrast, highly leveraged firms appear to employ operating leases to expand their debt capacity, suggesting that non-reporting motives dominate their lease activity.

While Yoon (2021) focuses on leasing decisions, Ma and Thomas (2023) examine what the shift to on-balance-sheet recognition meant for firms economically. Consistent with the other studies on the topic, they find that lessee firms significantly decreased their adoption of long-term operating leases in favour of short-term arrangements and capital expenditures following the standard's issuance. The shift was most pronounced among firms that previously had the strongest reporting incentives to maintain OBS financing. However, they find no evidence of negative economic consequences such as declining performance, deteriorating credit ratings, or increases in debt covenant violations, suggesting that the real effects of capitalisation were limited.

Building on Yoon (2021) and Ma and Thomas (2023), Heese et al. (2025) examine variable leases under ASC 842, specifically challenging the FASB's assumption that such expenses cannot be reliably estimated. Their evidence reveals that variable lease expenses are comparable to operating leases in persistence and predictability, directly contradicting the primary justification of their OBS treatment. The study further identifies lower minimum operating lease commitments and higher variable lease expenses post-adoption, suggesting a substitution from the former to the latter. Additionally, the authors find that neither credit rating agencies nor equity betas currently reflect these potential variable lease liabilities, providing managers with further incentives for such restructuring. Conservative estimates indicate that recognising variable lease liabilities would increase total firm debt by an average of 7.1%, underscoring the significant impact these unrecognised obligations have on financial transparency.

All in all, this body of evidence suggests that variable lease payments are economically significant and may be adopted strategically to achieve desired accounting outcomes. Whether similar patterns exist in the European IFRS 16 setting is ex ante unclear.

3.4. Theoretical Framework

3.4.1. Accounting Choice

The patterns documented in Sections 3.1-3.3 highlight that lease accounting decisions are complex and shaped by the broader environment firms operate in. Accounting choice provides a framework for understanding these dynamics. Fields et al. (2001) broadly define accounting choice as decisions made with the intent to shape accounting outcomes. They note that managerial intent is a central part of such decisions. That is, whether the action is primarily undertaken to affect reported accounting numbers rather than for ordinary business reasons. In practice, preparers are often required to exercise judgement when applying accounting standards. When exercised objectively, such judgement can

minimise information asymmetries between preparers and users. At the same time, it can also introduce inconsistencies in application across firms and over time. The problem is compounded by the incentive structure facing preparers. Fields et al. (2001) suggest that unconstrained accounting discretion likely imposes costs on users, as managers may face incentives that misalign with an objective presentation of information. Yet, understanding the incentives is not straightforward. Managers may, for instance, use accounting choice either to inflate the apparent value of the firm or to signal the belief that it is undervalued. The coexistence of competing motivations creates a regulatory dilemma. Attempts to constrain discretion must balance the costs of opportunistic behaviour against the informational benefits that well-exercised judgement provides.

Scholarly interest in the determinants and consequences of accounting choices dates to the 1960s. Early research assumed perfect capital markets, under which accounting methods should not impact firm value, thereby leaving little role for accounting choice (Fields et al., 2001). Research therefore reached an important turning point when Watts and Zimmerman developed PAT, which embedded accounting choice within a contracting framework, creating frictions that accounting information could mitigate.

3.4.2. Positive Accounting Theory

PAT aims to predict and explain patterns in firms' accounting choices. The theory is underpinned by the idea that contracting is costly, whether in market transactions, within-firm transactions or political processes. Because accounting numbers often feed into contractual outcomes, accounting choice forms part of the firm's efficient contracting technology. Managerial discretion over accounting choice is bounded by the "accepted set" of accounting methods under the firm's specific contracting constraints (Watts & Zimmerman, 1990). When used efficiently, managerial discretion increases value for all contracting parties. However, when used opportunistically, it shifts wealth in the manager's interest at the expense of others. A limitation of PAT research is the difficulty of distinguishing between economic efficiency and opportunistic motives as they can coexist (Fields et al., 2001; Watts & Zimmerman, 1990). Relatedly, Watts and Zimmerman (1990) note that researchers often ignore interaction effects among explanatory variables, treating incentives as additive when they may operate jointly.

PAT primarily explains accounting choices through three hypotheses. First, the bonus plan hypothesis suggests that managers whose bonuses are linked to accounting metrics are motivated to choose accounting methods that boost reported earnings. Second, the debt-to-equity hypothesis predicts that more leveraged firms are closer to covenant breaches, putting them at greater risk of technical default. These managers are therefore also more likely to adopt accounting methods that increase reported earnings. Third, the political cost hypothesis proposes that larger firms attract more regulatory and public scrutiny, providing a contrasting incentive to reduce or defer reported earnings through accounting (Watts & Zimmerman, 1990).

4. Hypothesis Development

Prior literature on IFRS 16 has established that the standard has had important effects on firms' financial reporting (Bradbury, 2024, as cited in IASB, 2025a; Lopes & Penela, 2025; Onie et al., 2023), decision usefulness (Hanlon et al., 2024, as cited in IASB, 2025a; Kusano & Yamashita, 2024, as cited in IASB, 2025a; Onie et al., 2024) and the real economic effects (Onie, 2025). Yet one feature of the standard has received little scholarly attention: variable lease payments linked to future performance or usage represent a remaining avenue for OBS-16 exposure.

Preparers report that judgement is required in distinguishing between variable lease categories (IASB, 2025b), suggesting that allowing for its definition-dependent exclusion from the lease liability creates meaningful discretion in lease design. Drawing on accounting choice and PAT, discretionary actions may reflect genuine operational efficiency or opportunistic behaviour, depending on managerial incentives and contracting costs (Fields et al., 2001; Watts & Zimmerman, 1990). In the lease setting, firms may behave opportunistically by structuring contracts with a higher proportion of OBS payments, allowing them to reduce their reported liabilities and thereby improve their leverage ratios. Research on former accounting standards under which leases could be kept OBS documents that incentives systematically affect lease structuring decisions (see, e.g., Imhoff & Thomas, 1988). Recent evidence from the U.S. setting confirms that these incentives remain economically relevant in the variable lease context. Ma and Thomas (2023) document post-ASC 842 substitution from long-term operating leases to OBS alternatives and capital expenditures, concentrated among firms with the strongest balance-sheet reporting motives. Yoon (2021) similarly documents a significant reduction in operating lease adoption after ASC 842 was implemented, alongside a shift toward OBS short-term and variable leases. Heese et al. (2025) advance these findings by focusing solely on variable leases. They document an economically meaningful shift toward variable leases among U.S. firms, while also demonstrating that the payments are sufficiently persistent and predictable to be reliably estimated, thereby raising concern about the justification for their exemption.

We build on this literature by examining whether similar patterns emerge among European firms under IFRS 16. However, we propose that not all entities have equal ability or motive to exploit this flexibility. As cautioned by Watts and Zimmerman (1990), accounting choice incentives may work jointly rather than in isolation. Therefore, we argue that lease intensity captures the opportunity to restructure leases, while leverage and financial constraints capture the incentive. We test these in sequence: first whether lease intensity is associated with variable lease adoption and then what moderates that relationship.

Building on Watts and Zimmerman (1990), we reason that while IFRS 16 permits variable lease structuring within the accepted set of accounting methods for all managers, a firm's

effective accepted set is further constrained by its existing lease portfolio. Firms with minimal lease exposure have few contracts to renegotiate and little reported liability to keep OBS-16, regardless of their reporting preferences. For such firms, the accounting treatment of variable lease payments is not material, and the costs associated with restructuring contracts are unlikely to be offset by meaningful balance-sheet benefits. Lease-intensive firms, by contrast, have both the substantial scope to restructure contracts and significant reported obligations at stake. Their lease portfolios typically span many contracts renegotiated on a rolling basis. Empirical evidence supports the view that firms with the most lease exposure respond to capitalisation rules by restructuring contracts for OBS treatment. For instance, Imhoff and Thomas (1988) observe this pattern among capital-lease-heavy firms upon the introduction of SFAS No. 13. Yoon (2021) similarly documents that OBS substitution following ASC 842 is concentrated among the most lease-intensive firms. While the institutional settings differ, we expect the underlying relationship to hold under IFRS 16.[4]

If lease intensity provides the opportunity to restructure, a natural follow-up is what determines which firms act on that opportunity. While lease capitalisation increases reported liabilities, the theoretical role of leverage in lease restructuring decisions is ex ante unclear. Two perspectives offer competing predictions about how leverage moderates the relationship between lease intensity and variable lease adoption.

View 1: The debt-to-equity hypothesis from PAT predicts that firms closer to covenant breaches have stronger incentives to choose accounting methods that ease those constraints (Watts & Zimmerman, 1990). While the original formulation centres on income-increasing accounting techniques, the underlying logic extends naturally to liability management when covenants reference balance sheet ratios or income-based metrics such as interest coverage. In the lease setting, Cornaggia et al. (2013) document that OBS lease obligations materially reduce reported leverage ratios and overstate firm performance, demonstrating that the accounting treatment of leases has a direct bearing on how leveraged a firm appears. Research conducted since the implementation of IFRS 16 also notes significant changes in balance sheet structures and conventional financial metrics (Bradbury, 2024, as cited in IASB, 2025a; Lopes & Penela, 2025). Applied to variable leases under IFRS 16, this implies that more leveraged firms have the most to gain from structuring payments as variable, since doing so reduces recognised lease liabilities and improves reported leverage. Lease-intensive firms with higher leverage thus combine the contractual opportunity to restructure payments with the strongest balance sheet pressure to do so. This perspective predicts a positive interaction between lease intensity and leverage.

[4] While Onie (2025) documents less pronounced reductions in new operating lease commitments among lease-heavy firms, this reflects anticipatory actions taken prior to the standard's adoption rather than post-implementation substitution. Thus, we do not draw on it when forming our expectation about the potential role of lease intensity in variable lease adoption.

View 2: Leverage reflects operational necessity rather than reporting pressure. Yoon (2021) presents evidence that challenges the classical view. In the U.S. setting, the substitution into short-term and variable leases is driven by less-leveraged firms, while highly leveraged firms do not meaningfully participate. The author argues that highly leveraged firms lease primarily to expand debt capacity, which, as noted by Eisfeldt and Rampini (2009), represents a real operational response to financial constraints. When firms lease because they cannot afford to purchase the asset outright, the decision reflects resource constraints rather than accounting considerations; access to the asset matters more than the balance sheet presentation. Such firms are therefore less responsive to opportunities for OBS treatment. Financially constrained firms may also face weaker bargaining positions in lease negotiations, further reducing their ability to structure contracts strategically for reporting purposes. Notably, Yoon (2021) attributes the active substitution observed among less-leveraged firms to reporting incentives. Because the baseline leverage of these firms is lower, a given increase in recognised liabilities produces a larger proportional deterioration of their debt-to-equity ratio, giving them the most to gain from maintaining OBS treatment. This perspective therefore predicts a negative interaction between lease intensity and leverage.

Synthesising the above, the classical PAT view treats leverage as a source of debt covenant reporting pressure, whereas Yoon's (2021) evidence suggests it instead reflects an operational commitment. The empirical distinction between the two lies in the sign of the interaction term. If variable lease adoption is driven by highly leveraged, lease-intensive firms, this supports the classical PAT amplification story. If instead the effect of lease intensity on variable lease adoption weakens as leverage rises, this supports the operational crowding-out mechanism documented by Yoon (2021). We therefore test both predictions in the IFRS 16 setting, framing them as competing hypotheses to be distinguished empirically:

H1a (PAT amplification): The effect of lease intensity on variable lease adoption increases with leverage

H1b (Operational dominance): The effect of lease intensity on variable lease adoption decreases with leverage

We additionally sharpen this test by examining firms that rely heavily on variable lease structures. We define "heavy-adopters" as firms in the top quartile of the annual variable lease intensity cross-section.[5] If variable leases serve as a strategic tool for balance sheet management, the leverage interaction should be most pronounced among these firms. Accordingly, we reframe the analysis from explaining the adoption of variable leases to estimating the logistic probability that a firm is classified as a heavy-adopter.

[5] Variable lease intensity (*VarLease_Intensity)* is defined as variable lease expenses scaled by capitalised lease expenses. Following how Heese et al. (2025) define finance lease expenses, capitalised lease expenses are defined as ROU asset depreciation + interest expense on the lease liability, representing on-balance-sheet lease expenses.

The preceding hypotheses examine whether and why firms adopt variable lease structures strategically. However, the normative implications of such behaviour depend on whether the IASB's rationale for excluding variable lease expenses from the lease liability is empirically justified. Their rationale partly rests on the view that variable payments cannot be reliably estimated at lease commencement given their dependence on future performance or usage. This concern was also reflected in feedback to the exposure draft, where respondents argued that it would in many cases be difficult to estimate such payments, and that the resulting forecast would be subject to a high level of measurement uncertainty (IASB, 2016c).

If variable lease payments are genuinely less predictable and more volatile than other lease categories, the exemption can be viewed as a practical concession to measurement reliability. However, if variable lease payments exhibit characteristics broadly comparable to those of other lease expense types,[6] the reliability rationale weakens and the exemption may instead primarily obscure balance sheet transparency. Evidence from the U.S. indicates the latter. Heese et al. (2025) find that variable lease expenses under ASC 842 are comparable in persistence and predictability to operating lease expenses, challenging the claim that they are inherently more difficult to estimate. Whether these findings generalise to the European IFRS 16 context is, however, not self-evident. IFRS 16 differs from ASC 842 in the classification of leases, the treatment of index- and rate-linked payments, and thus the scope of what is captured within the variable lease disclosure (KPMG, 2025). We therefore extend Heese et al. (2025) to the European IFRS 16 setting. If the IASB's measurement reliability rationale holds, variable lease payments should exhibit lower persistence, lower predictability, and greater sensitivity to economic activity than other lease expenses.[6] We formalise this as follows:

H2: Variable lease payments exhibit different statistical properties than short-term & low-value expenses and capitalised lease expenses

Specifically, we test:

- *H2a: Variable lease payments exhibit less persistence than other lease expenses*
- *H2b: Variable lease payments are less predictable than other lease expenses*
- *H2c: Variable lease payments exhibit greater sensitivity to changes in firm-level economic activity than other lease expenses*

[6] Other lease types refer to capitalised lease expenses and combined short-term & low-value expenses.

5. Methodology

5.1. Research Design

This study applies a quantitative panel-data approach to examine lease disclosure among European firms reporting under IFRS between the years 2019 and 2024. The selected period allows us to assess developments over time within the post-implementation setting of IFRS 16 and helps reduce the influence of macroeconomic shocks such as COVID-19. While some studies apply pre-post designs (see e.g., Heese et al., 2025; Ma & Thomas, 2023; Yoon, 2021), we refrain from doing so as OBS-16 variable lease expenses did not exist as a separately disclosed category under IAS 17. Although pre-implementation proxies of variable leases can be constructed, e.g., using rental expenses less one-year-ahead operating lease commitments, this also captures short-term & low-value leases ("ST+LV") and other rental expenses, thereby making it a noisy measure (Yoon, 2021; Heese et al., 2025). Our empirical approach draws on the broader literature on leasing and accounting choice (Caskey & Ozel, 2019; Imhoff & Thomas, 1988; Watts & Zimmerman, 1990; Yoon, 2021) as well as Heese et al. (2025), combining descriptive evidence with panel regression analysis to test our hypotheses. All models are estimated using R, a statistical computing environment widely adopted in accounting and finance research.

5.2. Sample Selection and Data Collection

This section describes how the final sample was constructed. We begin by outlining the screening criteria applied to derive the population, from which a random sample of firms is drawn. We then outline the data collection process, before presenting the final sample and subsamples used in the empirical analysis.

5.2.1. Sample Selection

Our sample is obtained using data from Capital IQ. The following selection criteria are applied: (1) The firm is publicly listed, (2) The firm is based in Europe, (3) The firm is currently operating, (4) The firm has an average market capitalisation above €500m in fiscal year 2025, (5) The firm is non-financial, defined as outside SIC codes 6000-6999, (6) The firm reports lease liabilities in at least two financial years during the sample period, (7) The firm applies IFRS as its accounting standard.

This study focuses exclusively on publicly listed firms as private firms do not face the same IFRS reporting requirements and generally have more limited data availability. The European setting, based on Capital IQ's primary geographic location, is chosen to ensure a sufficiently large population within a primarily IFRS-reporting region. Since a considerable portion of data is collected manually through footnotes, the sample is restricted to actively operating entities, minimising incomplete or irregular reporting

histories. In line with this, we also exclude firms with market capitalisations below €500m, as "smaller" firms typically provide less extensive lease disclosures, thereby reducing consistency and comparability of the data. We choose 2025 as the reference year for the size screen to allow for the inclusion of firms that were not publicly listed throughout the full sample period. While this criterion likely improves data quality, it limits the generalisability of the findings regarding "smaller" firms. Furthermore, it may bias the sample against firms that are operationally comparable in size to those retained in the final population, but trade at lower market capitalisations due to factors such as industry multiples and poor equity market performance. In line with previous research, we exclude financial firms (Yoon, 2021; Caskey & Ozel, 2019), because their regulatory environment and accounting practices may affect comparability with other industries. To ensure that the firms included are relevant to the purpose of the study, an additional selection criterion requires firms to have Capital IQ lease liabilities available for at least two years of the sample period.[7] [8] Finally, as certain European firms, particularly those outside the EU, may apply other accounting standards, the sample is restricted to firms that report under IFRS.

5.2.2. Data Collection

Given the absence of reliable databases containing detailed lease information for European IFRS reporters, particularly for OBS-16 components, all lease-related data is hand-collected from firms' annual reports across the study period 2019 to 2024. We complement this data with variables obtained from Capital IQ. Table A1 provides an overview of all manually extracted accounting line items and Capital IQ identifiers.

As the sample firms report in different currencies, all Capital IQ items are collected in each firm's reported currency to ensure consistency with the hand-collected data. Although within-firm tests do not require conversion to a common currency, it supports winsorisation and cross-sectional comparability. Accordingly, all raw continuous data items are converted to EUR using rates from Capital IQ. In line with guidance from IAS 21 (Deloitte, n.d.), balance sheet items use respective year-end closing rates, reflecting financial position at a specific point in time. For other items, we use fiscal year average exchange rates, reflecting an approximation of transactions occurring throughout the year. As all numeric variables are converted using the same exchange rate logic, this has a limited impact on within-firm ratios. To address extreme outliers, we winsorise all continuous variables at the top and bottom 1% of the annual cross-sectional distribution (Caskey & Ozel, 2019; Heese et al., 2025; Yoon, 2021).

[7] Lease liabilities, rather than net right-of-use assets, were used as the corresponding Capital IQ data items ("IQ_CURRENT_PORT_LEASES" and "IQ_LONG_TERM_LEASES") were found to be more reliable when cross-checking against annual reports. These items are strictly used for screening and are not included in the data presented in Section 6, where all lease-related items are hand-collected.
[8] A two-year threshold was chosen to minimise singleton observations.

5.2.3. Final Sample

Table 1 presents our population after applying our selection criteria. From the resulting population of 989 firms, we randomly selected 300 firms to aid the time-consuming data collection process.[9] As alternative sampling strategies, one could have restricted the sample to industries with heavier lease intensity or regions with similar IFRS enforcement. While this might have enhanced comparability across firms, it would have sacrificed the generalisability of the results. Given our aim to document variable lease disclosure practices systematically across European IFRS reporters, a broad cross-sectional design was deemed more appropriate. In line with Ma and Thomas (2023) and Heese et al. (2025), the main sample is constructed as an unbalanced panel. This means that firms are included if complete lease data is available for more than one year during the sample period. Complete lease data is defined as the simultaneous availability of net-ROU assets, total lease liabilities, depreciation of ROU assets, and interest expense on lease liabilities.[10] Using an unbalanced sample allows us to retain a larger number of firm-year observations and helps reduce survivorship bias. We additionally construct a balanced panel consisting of the firms that have data available in all years.[11] After removing firms with incomplete lease data, the unbalanced sample consists of 1,446 observations and 251 unique firms.[12]

The loss of 49 firms may affect results in two ways. First, the smaller final sample reduces statistical power. Although we could have continued sampling until reaching 300 firms with complete observations, we deemed that the time spent on additional data collection instead of analysis would not justify the marginal gain in statistical power. Second, if the excluded firms differ systematically from the retained firms, for example in terms of disclosure quality, industry composition, or lease intensity, the sample may be subject to selection bias. While the loss is unlikely to materially undermine the main analysis, results should still be interpreted as representative of firms with complete lease disclosures.

Our later analysis draws on three distinct types of samples. First, the full regression sample comprising all firm-year observations with complete lease data, irrespective of whether the firm reports variable lease expenses. Second, the ever-adopter sample, constructed separately for variable lease expenses, which a firm enters if it reports variable lease expenses in at least one year during the sample period. All firm-year observations for such firms are retained, including years in which variable lease expenses may be zero. Third, the active-adopter sample, which includes the individual observations in which a firm reports a strictly non-zero amount for the relevant lease expense type, regardless of its history in other years. The latter distinction is consequential for the

[9] Using a formula combining the "TAKE", "SORTBY" and "RANDARRAY" Excel functions.
[10] We code variable, short-term and low-value lease expenses as zero when the amount is stated as "immaterial" or "insignificant" (Heese et al., 2025), or when not mentioned at all.
[11] The balanced panel is primarily used in descriptive statistics.
[12] The actual number of observations varies across specifications, depending on singleton observations, perfect separation and data availability from Capital IQ.

empirical models (see Section 6) using the natural logarithm of lease expense variables, which are undefined for zero or negative values.

Table 1. Sample Selection Overview

Selection criteria	**No. of Firms**
Public European companies	6,063
(-) Market cap below €500m (avg. 2025)	-4,695
(-) Financial companies (SIC 6,000-6,999)	-256
(-) Less than 2 years of reported lease liabilities	-40
(-) Does not apply IFRS	-83
Final population	**989**
Random sample	**300**
(-) Missing data	-49
Unbalanced Panel	
Full sample	**251**
No. of firm-year observations	*1,446*
Ever-adopter of variable leases	**86**
No. of firm-year observations	*507*
Active-adopter variable leases	**86**
No. of firm-year observations	*450*
Balanced Panel	
Full sample	**224**
No. of firm-year observations	*1,344*

Note: This table reports the sample selection process, showing the number of firms removed at each screening step and the composition of the final unbalanced and balanced panels, including the number of firms and firm-year observations for the full sample, ever-adopters, and active-adopters of variable leases.

5.3. Empirical Models

This section presents the empirical approach used to test the hypotheses. The analysis proceeds in three parts. First, we examine the prevalence of variable lease adoption and the firm characteristics associated with both its incidence and intensity. Second, we estimate interaction models to assess whether the relationship between lease intensity and variable lease adoption depends on leverage (H1a and H1b) or cash constraints in exploratory tests. These models are estimated across the full regression sample, active-adopters, and heavy variable lease adopters. Finally, drawing on Heese et al. (2025), we examine the persistence, predictability, and revenue responsiveness of variable lease payments relative to other lease categories (H2a, H2b and H2c). The main variables are defined when first introduced, with full variable definitions provided in Table A1.

5.3.1. Prevalence and Firm Characteristics

Prevalence

To contextualise the prevalence of variable leases beyond descriptive statistics, we estimate the following ordinary least squares ("OLS") regression model using ever-adopters:

$$VarLease\_Intensity_{i,t} = \sum_{t=2020}^{2024} \beta_T * Year_T + \alpha_i + \varepsilon_{i,t} \quad (1)$$

where *VarLease_Intensity* represents variable lease expenses scaled by capitalised lease expenses for firm *i* in year *t*. This captures variable lease adoption relative to capitalised lease expenses. The dependent variable is left in an unlogged form to retain zero observations from ever-adopters. This comes at the cost of a less symmetric dependent variable distribution.[13] The main explanatory variables are year indicators with 2019 as the omitted reference year. The coefficients β_{2020} to β_{2024} therefore capture how the intensity ratio evolves relative to the first year of mandatory IFRS 16 reporting. A pattern of increasing coefficients would be consistent with an upward trend in intensity. α_i measures firm fixed effects, which absorb all time-invariant company characteristics such that identification comes from within-firm variation. Following Heese et al. (2025), Ma and Thomas (2023), and Yoon (2021), standard errors are clustered at the firm level to address potential within-firm dependence over time and heteroskedasticity.

Firm Characteristics

To investigate whether variable lease adoption is systematically related to firm characteristics, we estimate panel association models relating variable lease adoption to a set of predetermined firm attributes. The purpose of these tests is to assess whether variable lease adoption is linked to observable characteristics that plausibly capture reporting or non-reporting incentives (Caskey & Ozel, 2019), not to identify causal effects. As no established benchmark model exists in the literature for variable leases specifically, we draw on broader research on leasing, OBS financing, and accounting choice to motivate our specification. The baseline models are specified as follows:

$$\begin{aligned} Logit\left(P\left(HasVarLease_{i,t} = 1\right)\right) = {} & \beta_1 Ln\_Size_{i,t-1} + \beta_2 Lease\_Intensity_{i,t-1} + \\ & \beta_3 Sales\_Vol_{i,t-1} + \beta_4 Ln\_Leverage_{i,t-1} + \beta_5 Cash_{i,t-1} + \beta_6 ROA_{i,t-1} + \\ & \beta_7 Loss_{i,t-1} + \beta_8 \mathrm{Div}_{i,t-1} + \gamma_t + \delta_S + \varepsilon_{i,t} \end{aligned} \quad (2)$$

[13] In subsequent models, intensity of adoption is estimated conditional on participation, i.e., restricting the sample to active-adopters. As the distribution of strictly non-zero observation ratios is right-skewed, logging is deemed appropriate.

$$Ln\_VarLease\_Intensity_{i,t} = \beta_1 Ln\_Size_{i,t-1} + \beta_2 Lease\_Intensity_{i,t-1} + \beta_3 Sales\_Vol_{i,t-1} + \beta_4 Ln\_Leverage_{i,t-1} + \beta_5 Cash_{i,t-1} + \beta_6 ROA_{i,t-1} + \beta_7 Loss_{i,t-1} + \beta_8 \mathrm{Div}_{i,t-1} + \gamma_t + \delta_S + \varepsilon_{i,t} \quad (3)$$

where the dependent variable captures variable lease adoption in two complementary ways. Model (2) is a logistic regression model estimated on the full sample, in which *HasVarLease* is equal to one if firm *i* reports variable lease payments in year *t*, capturing the incidence of adoption. Model (3) is an OLS regression estimated on the active variable lease adopter subsample. The outcome, variable lease intensity (*Ln_VarLease_Intensity*), represents the natural logarithm of variable lease expenses scaled by capitalised lease expenses for firm *i* in year *t*, capturing the intensity of adoption conditional on participation. Both models are estimated with year fixed effects (γ_t) to absorb common shocks over time and industry fixed effects based on SIC division (δ_S) to control for persistent sector differences in leasing patterns and business models.[14] Firm fixed effects are excluded as they would absorb all time-invariant firm heterogeneity, thereby removing the between-firm variation used to identify the cross-sectional associations of interest. Standard errors are clustered at the firm level.

All explanatory variables are measured at *t-1*, mitigating reverse causality concerns by making it more likely that firm attributes precede lease structuring choices. The chosen explanatory variables are motivated by a combination of classical PAT (Watts & Zimmerman, 1990) and prior literature on variable lease and OBS lease adoption (Caskey & Ozel, 2019; Ma & Thomas, 2023; Heese et al., 2025; Yoon, 2021).

Size (*Ln_Size*) is measured as the natural logarithm of total assets (Heese et al., 2025), as larger firms may have systematically different leasing patterns and broader access to external financing. Lease intensity (*Lease_Intensity*), measured as net-ROU assets scaled by total assets, captures a firm's reliance on leasing as a financing source. Firms with greater lease exposure arguably have more to gain from, and a greater opportunity to optimise individual contract structures. The intuition and variable construction follow Yoon (2021), who finds that lease-intensive firms were the primary drivers of substitution from operating leases following ASC 842's implementation.[15] Operational volatility (*Sales_Vol*) is measured as the rolling standard deviation of annual natural-logarithmic revenue growth over the preceding three years, and proxies the demand for business

[14] Industry fixed effects ("SIC fixed effects") are based on SIC divisions rather than, for instance, two-digit codes. This is due to a meaningful number of perfect separations in the logit models, specifically related to heavy variable lease adopters, with the broader classification applied consistently across all specifications to ensure comparability.

[15] Yoon (2021) measures pre-adoption lease intensity by scaling one-year-ahead operating lease commitments*100 to assets. Thus, the exact variable is not directly applicable, but the intuition of constructing lease intensity as the relative importance of leases in a firm's asset structure lends itself.

flexibility (Caskey & Ozel, 2019; Yoon, 2021).[16] The logic is that firms with more volatile revenues may prefer variable-payment contracts over fixed commitments in the face of an uncertain operational environment. Leverage (*Ln_Leverage*), measured as the natural logarithm of debt-to-equity in the main specification, controls for capital structure and financing conditions, affecting firms' incentives and ability to lease (Watts & Zimmerman, 1990; Yoon, 2021). Logging debt-to-equity means we lose observations where equity is negative, which may lead to the exclusion of the most financially distressed firms.[17] Thus, as a robustness check, we also test the natural logarithm of debt-to-assets as an alternative measure of leverage (*Ln_Debt_Assets*).[18] Cash-to-assets (*Cash*) is included as a measure of financial constraint (Yoon, 2021). Firms with weaker internal funds are more likely to lease (Eisfeldt & Rampini, 2009; Ma & Thomas, 2023; Yoon, 2021), and may also prefer variable over fixed lease commitments because they lack the liquidity buffer to absorb predictable cash outflows. Profitability is captured through ROA (*ROA*) (Heese et al., 2025), and *Loss*, an indicator equal to one if net income is negative (Yoon, 2021). Together, they reflect firm performance and credit access, as underperforming firms face tighter financing conditions and thus greater incentives to preserve flexibility. Finally, dividends scaled by total assets (*Div*) reflects broader financial health and available internal funds (Eisfeldt & Rampini, 2009; Yoon, 2021), where dividend-paying firms are expected to have less incentive for OBS financing.

5.3.2. Determinants of Variable Lease Adoption

To assess whether variable lease adoption reflects strategic structuring shaped by both opportunity and incentives, we estimate a set of interaction models.

Leverage as a Moderator of Lease Intensity

First, we assess whether on-balance lease intensity and leverage jointly influence variable lease adoption. Our framework posits that lease intensity captures the contractual opportunity to restructure leases toward variable payments. However, the role of leverage, as discussed in Section 4, is theoretically ambiguous: classical PAT predicts that leverage amplifies the OBS-16 reporting incentive (H1a), while alternative evidence suggests that highly leveraged firms lease primarily for operational reasons (Yoon, 2021), making them less responsive to such incentives (H1b). The baseline interaction models are:

[16] Caskey and Ozel (2019) and Yoon (2021) measure sales volatility over a five-year window. We choose three years instead to preserve observations in an already limited sample, although this may result in a slightly noisier measure.
[17] 14 observations have negative equity (*t-1)*, representing less than 1% of the sample. Of those, 6 of firm-year observations also have non-zero variable leases.
[18] In untabulated robustness tests related to Models (4)-(5) we also run raw debt-to-assets (*Debt_Assets).*

$$Logit(P(HasVarLease_{i,t} = 1)) = \beta_1(Lease\_Intensity^{c}_{i,t-1}) + \beta_2(Ln\_Leverage^{c}_{i,t-1}) + \beta_3(Lease\_Intensity^{c}_{i,t-1} * Ln\_Leverage^{c}_{i,t-1}) + Controls_{i,t-1} + \gamma_t + \delta_S + \varepsilon_{i,t} \quad (4)$$

$$Ln\_VarLease\_Intensity_{i,t} = \beta_1(Lease\_Intensity^{c}_{i,t-1}) + \beta_2(Ln\_Leverage^{c}_{i,t-1}) + \beta_3(Lease\_Intensity^{c}_{i,t-1} * Ln\_Leverage^{c}_{i,t-1}) + Controls_{i,t-1} + \gamma_t + \delta_S + \varepsilon_{i,t} \quad (5)$$

where the dependent variables are defined as in Models (2) and (3). Both interaction variables are mean-centred (c) at the full sample mean. This reduces non-essential multicollinearity between the interaction term and its constituent variables. Specifically, as noted by Wooldridge (2013), centring means that the coefficient on each constituent variable captures its association with the outcome when the other interacted variable is at its sample mean. The controls comprise the remaining firm characteristics introduced in Equations (2) and (3), excluding *Ln_Leverage* and *Lease_Intensity*. All specifications again include year (γ_t) and SIC division fixed effects (δ_S), and standard errors clustered at the firm level.

The competing theoretical predictions, H1a (positive interaction) and H1b (negative interaction), are distinguished by the coefficient on the interaction term (β_3). A positive estimate implies that higher leverage amplifies the relationship between lease intensity and variable lease adoption, consistent with debt-covenant reporting pressure. A negative estimate implies that higher leverage attenuates the relationship, consistent with operational necessity crowding out reporting incentives. As a robustness check, we replace the leverage definition with logged (*Ln_Debt_Assets*) and unlogged (*Debt_Assets*) debt-to-assets, reducing concerns that the results are sensitive to the functional form of leverage. We further re-estimate Model (5) using *Ln_VarLease_Assets* as the dependent variable, where variable lease expenses are scaled by total assets as opposed to capitalised lease expenses.[19]

Cash Constraints as a Moderator of Lease Intensity

As an extension, we replace the continuous leverage variable with a cash-constraint indicator to examine whether liquidity pressure is the operative mechanism, estimated as follows:

$$Logit(P(HasVarLease_{i,t} = 1)) = \beta_1(Lease\_Intensity^{c}_{i,t-1}) + \beta_2(Low\_Cash_{i,t-1}) + \beta_3(Lease\_Intensity^{c}_{i,t-1} * Low\_Cash_{i,t-1}) + Controls_{i,t-1} + \gamma_t + \delta_S + \varepsilon_{i,t} \quad (6)$$

[19] We abandon this measure in the remainder of the methodology due to concerns about spurious ratio-on-ratio correlation. See Section 6.2.1 for a more detailed discussion.

$$Ln\_VarLease\_Intensity_{i,t} = \beta_1\left(Lease\_Intensity^{c}_{i,t-1}\right) + \beta_2\left(Low\_Cash_{i,t-1}\right) + \beta_3(Lease\_Intensity^{c}_{i,t-1} * Low\_Cash_{i,t-1}) + Controls_{i,t-1} + \gamma_t + \delta_S + \varepsilon_{i,t} \quad (7)$$

Low_Cash equals one if a firm-year observation falls in the bottom quartile of cash-to-assets *(Cash)* in the full regression sample. *Cash* is excluded from the controls, while *Ln_Leverage* is added. Beyond that, the models follow the same structure as Models (4) and (5). A positive estimate on β_3 would imply that financial pressure, proxied as a relatively low cash balance, amplifies the relationship between lease intensity and variable lease adoption, while a negative coefficient would imply the opposite.

Heavy-Adopters of Variable Leases

We extend the analysis on the intensity of adoption by examining heavy-adopters, defined as firms in the top quartile of the year-specific distribution of variable-to-capitalised lease expenses (*VarLease_Intensity*) among active-adopters. The classification is computed within each fiscal year to account for time-varying distributional shifts, isolating firms for which exposure to variable leases in year *t* carries the greatest relative economic significance. If variable leases serve as a strategic management tool, the leverage interaction should be most pronounced among these firms. The heavy-adopter models apply the same structure as Models (4) and (6) on the active-adopter sample, but the dependent variable is replaced by $Logit(\mathrm{P}\left(Heavy\_Year_{i,t} = 1\right))$ equal to one if firm *i* is classified as a heavy-adopter in year *t*:

$$Logit(P\left(Heavy\_Year_{i,t} = 1\right)) = \beta_1\left(Lease\_Intensity^{c}_{i,t-1}\right) + \beta_2\left(Ln\_Leverage^{c}_{i,t-1}\right) + \beta_3(Lease\_Intensity^{c}_{i,t-1} * Ln\_Leverage^{c}_{i,t-1}) + Controls_{i,t-1} + \gamma_t + \delta_S + \varepsilon_{i,t} \quad (8)$$

$$Logit(P\left(Heavy\_Year_{i,t} = 1\right)) = \beta_1\left(Lease\_Intensity^{c}_{i,t-1}\right) + \beta_2\left(Low\_Cash_{i,t-1}\right) + \beta_3(Lease\_Intensity^{c}_{i,t-1} * Low\_Cash_{i,t-1}) + Controls_{i,t-1} + \gamma_t + \delta_S + \varepsilon_{i,t} \quad (9)$$

As a robustness check, we re-estimate Model (8) by replacing the leverage measure with *Ln_Debt_Assets*. Additionally, we re-estimate both models, redefining heavy-adopters as firms in the top tercile and top quintile of the year-specific *VarLease_Intensity* distribution, assessing whether results are sensitive to the chosen classification threshold.

5.3.3. Measurement Reliability and Recognition

To examine whether variable lease payments are economically distinct from the other lease categories, we follow Heese et al. (2025) and analyse their statistical properties along three dimensions: persistence (H2a), predictability (H2b), and revenue

responsiveness (H2c). We further estimate the implied liability of bringing variable leases onto the balance sheet.

Persistence

Persistence is defined as the degree to which current lease expenses are predicted by past values. For each lease category separately, we estimate the following model on the subsample of active-adopters:

$$Ln\_Lease_{i,t} = \phi Ln\_Lease_{i,t-1} + Ln\_Size_{i,t} + ROA_{i,t} + Ln\_Debt\_Assets_{i,t} + \gamma_t + \varepsilon_{i,t} \quad (10)$$

where *Ln_Lease* denotes the natural logarithm of a given type of lease expense for firm *i* in year *t*. The coefficient ϕ captures the degree of persistence, where higher values indicate that lease expenses are more strongly related to their past values. As the dependent variable is included as a lagged explanatory variable, we exclude firm fixed effects to avoid dynamic panel bias. Controls include the natural logarithm of total assets (*Ln_Size*), ROA (*ROA*), and the natural logarithm of debt scaled by assets (*Ln_Debt_Assets*).[20] Year fixed effects (γ_t) are included to control for common time trends. Standard errors are clustered at the firm level. We check the robustness of these results by re-estimating the models without winsorisation. Furthermore, we test a two-year and three-year lag horizon (Heese et al., 2025).

Predictability

Predictability is assessed through one-step-ahead forecast errors under a naïve random-walk benchmark, where the prior period's value serves as the forecast for the current period. To ensure comparability across lease categories with different distributions, lease expenses are standardised to have zero mean and unit variance. Mean squared forecast errors are then computed as:

$$MSE_l = \frac{1}{N_l} \sum_{i,t} \left(Z_{i,t,l} - Z_{i,t-1,l} \right)^2 \quad (11)$$

where *l* indexes the lease category, and $Z_{i,t,l} = (Lease_{i,t,l} - \bar{\mu}_l) / \sigma_l$ denotes the z-score standardised lease expense for firm *i* in year *t* for lease type *l*. $\bar{\mu}$ represents the mean lease expense for the relevant lease category, and σ is the corresponding standard deviation, both calculated within that lease type's active sample. Higher values of MSE_l indicate lower predictability. Pairwise MSE differences are estimated on intersection samples, i.e., firm-years where both categories have valid forecast errors. RMSE differences are

[20] We follow Heese et al. (2025) in using *Ln_Debt_Assets* as a control, deviating from our main specification of leverage, in order to ensure comparability with their results.

reported as a supplementary measure of economic magnitude.[21] Since variable leases should fluctuate with business activity, we expect them to be less predictable than the other lease types, reflected in a positive pairwise MSE difference. Robustness is tested by extending the forecast horizon to two and three years (Heese et al., 2025).

Revenue Responsiveness

Next, we examine responsiveness to firm activity by estimating the elasticity of each lease category with respect to contemporaneous revenue. If variable leases are driven by usage or performance, they should co-vary more closely with business activity than other lease categories. We estimate the below specification on respective active-adopter subsamples:

$$Ln\_Lease_{i,t} = \beta_1 Ln\_Revenue_{i,t} + Controls_{i,t} + \alpha_i + \gamma_t + \varepsilon_{i,t} \quad (12)$$

where the coefficient β_1 is a revenue elasticity coefficient, measuring the percentage change in lease expense associated with one per cent change in revenue. A higher coefficient indicates greater responsiveness to changes in firm activity. Controls are defined as in Model (10). Firm fixed effects (α_i) and year fixed effects (γ_t) are included, and standard errors are clustered at the firm level. As a robustness check, we replace revenue with lagged and two-year average revenue (Heese et al., 2025).

If variable lease payments are genuinely responsive to economic conditions, their reaction to large revenue shocks should be more pronounced than for other lease categories, whose amounts are largely predetermined by contractual obligations. To examine this asymmetry, we estimate the following specification:

$$Ln\_Lease_{i,t} = \beta_1 (Large\_Drop_{i,t}) + Controls_{i,t} + \alpha_i + \gamma_t + \varepsilon_{i,t} \quad (13)$$
$$Ln\_Lease_{i,t} = \beta_1 (Large\_Increase_{i,t}) + Controls_{i,t} + \alpha_i + \gamma_t + \varepsilon_{i,t} \quad (14)$$

where *Ln_Revenue* in Model (12) is replaced with large discrete revenue changes. *Large_Drop* is equal to one for firm-years in the bottom decile of revenue changes, and *Large_Increase* equals one for firm-years in the top decile. For robustness, both are operationalised across the full sample period, and within each fiscal year. β_1 captures the differential adjustment in the respective lease expense during periods of large revenue declines (13) and increases (14) and should be larger in magnitude for variable leases.

Taken together, Models (10)-(14) provide a comprehensive assessment of whether variable lease payments broadly exhibit the properties aligned with the IASB's justification for their exclusion from the lease liability.

[21] RMSE is the square root of MSE. RMSE difference is thus computed as the square root of the MSE for a particular lease type minus the square root of the MSE for another lease type.

Magnitude of Variable Lease Payments

To estimate the economic magnitude of variable leases, we follow Heese et al. (2025) and compute their implied on-balance liabilities. The approach multiplies IFRS 16 lease liabilities by the year-specific ratio of variable-to-capitalised lease expense *(c=VarLease_Intensity)*. To ensure that capitalised lease expense serves as a reliable anchor, the intensity ratio should be stable over time and insensitive to revenue fluctuations.[22] These properties are validated by re-estimating the persistence, elasticity, and large-drop specifications from Model (10), (12), and (13) with *VarLease_Intensity* as the dependent variable. The implied liability is then computed as:

$$VarLease\_Liability_{i,t} = c_{i,t} * Lease\_Liability_{i,t} \quad (15)$$

We estimate the lease liability using the ever-adopter sample, and, in line with Heese et al. (2025) compute an additional firm-specific minimum ratio where *c* represents the lowest observed value of *VarLease_Intensity* for firm *i*. This avoids inflating the implied liability in years where the intensity ratio may be temporarily elevated.

5.4. Limitations

Several limitations of this methodology should be acknowledged, warranting a discussion of the validity, reliability, and generalisability of the study.

Validity

Validity concerns whether the study measures what it intends to. A central limitation is that the analysis is bounded by what firms choose to disclose. Considering ICAEW's (2025) concern about variable lease disclosure quality, the prevalence we document likely understates its true extent. While several firms acknowledge variable lease arrangements, they do so without quantifying them, either citing the amounts as immaterial or that they are expensed as incurred (see Figure A2) or embedding them with other exemptions (see Figure A3). Thus, we are constrained by disclosures that could reflect true absence or a non-zero yet undisclosed amount. Furthermore, the underlying lease contracts are not accessible. While we observe reported variable lease expenses, we cannot determine the contractual mechanisms underlying them. For instance, the data does not reveal the performance- or usage-linked basis for payments, nor whether payments are subject to caps or floors. Consequently, we can associate adoption with firm-level characteristics and document the properties of variable leases, but we cannot fully explain why firms adopt these arrangements or why expenses behave as observed.

[22] Heese et al. (2025) use operating lease expenses as the anchor, noting that finance leases could have been used instead. Given that this categorisation does not exist for lessees under IFRS 16, we use capitalised lease expenses, which receive broadly similar accounting treatment to finance leases under ASC 842.

Validity is also affected by the labour-intensive data collection process which, given time constraints, led us to restrict the sample to 300 firms.[23] While sufficient for the regression analysis, it limits industry-level inference. Fixed effects are therefore applied at the SIC division level, instead of two-digit industry level, since finer classifications reduce observations and statistical power in untabulated tests of the logit models. While certain variables capture some industry-level variation, they do not absorb everything. A larger sample would thus allow more granular industry- and country-specific conclusions.

Finally, without a natural experiment or instrumental variable, our findings should be interpreted as associative rather than causal. Several variables may also carry more than one economic meaning, such as leverage capturing both covenant proximity and operational liquidity pressure. The cash-based test aims to sharpen this distinction, but isolating specific incentives using a single variable remains difficult. Furthermore, omitted correlated variables and measurement errors may affect estimated associations.

Reliability

Reliability concerns whether the study could be repeated with similar results. The absence of comprehensive databases for European IFRS lease disclosures necessitates hand-collection from annual reports, introducing human error risk despite several rounds of cross-checks. Consistent variable definitions and procedures strengthen reliability, but coding errors cannot be ruled out. Reliability further depends on timing. Our sample spans 2019 to 2024, and lease structuring decisions may evolve as firms gain familiarity with the standard, economic conditions change, or with potential revisions to IFRS 16 following the Post-implementation Review. Thus, the results may not be stable if the institutional or regulatory environment changes. Our findings should therefore be read as evidence on a particular window of IFRS 16 application, rather than a definitive characterisation of variable lease behaviour under the standard.

Generalisability

Generalisability concerns how far the findings can be extended beyond the sample. Our study focuses on large European IFRS reporters with leases recorded on the balance sheet, meaning the results may not generalise to firms that are private, smaller, in the financial sector, without on-balance-sheet lease activity, or those that report under other accounting standards. The potential selection bias from missed observations could also affect generalisability if these firms differ systematically from those included. This paper further adopts a preparer perspective rather than a user one. We examine firm-level disclosures and characteristics, not how financial statement users respond to them. Accordingly, equity pricing, analyst forecasts, and lender behaviour are not tested, and thus we cannot speak to the potential market consequences of variable leases.

[23] Before the loss of firms due to incomplete data.

6. Findings

This section presents the results in three parts, each addressing a distinct gap identified in the literature review and hypothesis development. Section 6.1 provides a descriptive summary of variable lease expenses across our sample, addressing the empirical gap concerning limited evidence existing on the prevalence, magnitude, and trend of variable leases over time in the IFRS setting. Sections 6.2 through 6.4 turn to the theoretical and literature-driven gaps. Sections 6.2 and 6.3 examine the determinants of variable lease adoption, testing the competing predictions of Hypothesis 1a, grounded in PAT's debt covenant hypothesis (Watts & Zimmerman, 1990), and Hypothesis 1b, derived from Yoon's (2021) operational dominance view. Section 6.4 addresses the measurement reliability rationale underlying the IASB's exemption by extending the analysis of Heese et al. (2025) to the IFRS setting. Specifically, it tests Hypotheses 2a, 2b, and 2c by examining whether variable lease expenses exhibit persistence, predictability, and revenue sensitivity to evaluate the argument for their exclusion from the lease liability.

6.1. Prevalence of Variable Lease Adoption and Associated Firm Characteristics

Research from the U.S. setting suggests that variable leases have become increasingly common following ASC 842 adoption (Heese et al., 2025; Yoon, 2021), yet systematic evidence from IFRS 16 adopters remains limited. We address this empirical gap by documenting the prevalence and magnitude of variable lease expenses from 2019 to 2024 across our sample of European IFRS 16 reporters.

6.1.1. Descriptive Statistics

Table 2 presents summary statistics for the unbalanced sample, reporting the distribution of non-zero observations.[24] [25] In the sample, the average firm-year has a market capitalisation of €11.4bn, annual revenue of €9.4bn, total assets of €14.2bn, total liabilities of €9.0bn, and debt of €4.0bn. On the leasing side, firms carry an average of €513m in net-ROU assets and €543m in lease liabilities. Among the 450 firm-years with non-zero variable lease expenses, the mean is €36m, and among the 1,029 firm-years with non-zero ST+LV expenses, the mean is €33m. These near-identical figures suggest that, among firms reporting non-zero amounts, the two OBS-16 categories are broadly comparable in average magnitude. Capitalised lease expenses present a different picture, with a mean of €129m, confirming that on-balance lease expenses are materially larger than the OBS-16 category for the typical lessee.

[24] Meaning that descriptive statistics for each item is restricted to firm-years reporting non-zero values for the respective item.
[25] Table B1 shows a full descriptive statistics table for the main regression variables.

Table 2. Summary Statistics, Unbalanced Sample (EURm)[26]

Variable	N	Mean	SD	P_{10}	P_{25}	P_{50}	P_{75}	P_{90}
Market Cap[27]	1,402	11,386	27,360	568	1,089	2,761	8,843	25,551
Total Revenue	1,446	9,441	21,662	362	802	2,507	7,282	21,208
Total Assets	1,446	14,239	29,597	464	1,183	3,523	10,586	39,482
Total Liabilities	1,446	9,010	18,999	213	631	1,961	6,585	26,384
Total Debt	1,446	4,042	8,958	52	205	859	3,373	11,523
Net ROU Asset[28]	1,445	513	1,271	11	36	118	392	1,192
Variable Lease Expense	450	36	121	0	1	3	17	67
ST+LV Lease Expense	1,029	33	97	0	1	4	19	83
NonCap Lease Expense	1,059	47	134	0	1	5	24	111
Capitalised Lease Expense	1,446	129	288	3	9	35	106	327
Total Lease Liability	1,444	543	1,377	11	39	129	415	1,255
Current Lease Liability	1,427	105	231	3	8	30	90	253
Non-current Lease Liability	1,442	440	1,163	8	29	96	313	976

Note: This table presents non-winsorised summary statistics for the unbalanced sample (1,446 firm-years, 251 firms), restricted to non-zero observations for each variable. Statistics reported are the number of observations, mean, standard deviation, and the 10th, 25th, 50th, 75th and 90th percentiles.

The distribution of firm characteristics shows that the sample is heavily skewed to the right for all key variables. For firm size, the mean revenue of €9.4bn is approximately four times the median of €2.5bn, with a similar pattern observed for total assets. This gap between mean and median is consistent across liabilities and debt, indicating that a relatively small number of observations pull the sample averages above the typical firm-year observation. The quantile distribution is even more pronounced for lease variables, demonstrating a concentration of lease activity among a subset of heavy-adopters. For variable leases, the median active-adopter reports only €3m and the 75th percentile is €17m, yet the mean stands at €36m. Firms at or above the 90th percentile, which begins at €67m, thus exert considerable upward pressure on the average. Nevertheless, most firms still do not report variable leases (e.g., 173 out of 248 firms in 2024) as indicated by the distribution in Table B1. A similar pattern holds for ST+LV leases, where a median of €4m and 90th percentile of €83m reflect a long right tail. At the upper decile, non-capitalised lease expenses, defined as combined variable and ST+LV lease expenses, reach €111m. This amount is economically significant and reveals a group of firms with considerably greater reliance on OBS-16 lease structures, suggesting that the aggregate picture (Table B1) masks meaningful heterogeneity at the firm level. This motivates our separate examination of heavy-adopters later in the paper (see Section 6.3).

[26] Zeros in the percentile columns reflect rounding of positive values below €0.5m.

[27] Market capitalisation is unavailable for some firm-year observations as certain firms went public after 2019, yet still disclosed IFRS 16 data either in preparation for their IPO or retrospectively in their first post-IPO annual report. We retain these observations to preserve sample size, further supported by the fact that market-based data is not used in the empirical analysis.

[28] One firm observation reports zero net-ROU assets at year-end, while still recognising depreciation and interest expense from lease obligations winding down in that final year.

6.1.2. Trend Over Time

Table 3 presents the prevalence of OBS-16 lease payments by year for the unbalanced (Panel A) and balanced (Panel B) samples. In Panel A, approximately 73% of firm-years report some form of OBS-16 lease expense throughout the sample period, a pattern largely driven by ST+LV leases, which are reported in roughly 71% of firm-years. Variable lease expenses are less common but still present in 29.3-32.7% of firm-years, yielding a consistent roughly 2:1 ratio relative to ST+LV adopters. Panel B presents broadly similar patterns but with slightly higher and more stable prevalence rates, where variable leases are present in 32.1-33.9% of firm-years and ST+LV leases in 71.0-72.8%.

Table 3. Prevalence of Non-Capitalised Lease Expenses by Year and Sample

Panel	Year	Firm-years	% with Variable	% with ST+LV	% with both	% with either
Panel A: Unbalanced	2019	226	32.7%	71.7%	31.4%	73.0%
	2020	236	31.4%	70.8%	29.2%	72.9%
	2021	242	32.6%	71.1%	30.2%	73.6%
	2022	245	30.6%	70.6%	28.6%	72.7%
	2023	249	29.3%	71.9%	27.3%	73.9%
	2024	248	30.2%	71.0%	27.8%	73.4%
Panel B: Balanced	2019	224	32.6%	71.9%	31.2%	73.2%
	2020	224	32.1%	71.0%	30.4%	72.8%
	2021	224	33.9%	71.9%	31.7%	74.1%
	2022	224	33.0%	71.0%	30.8%	73.2%
	2023	224	32.1%	72.8%	29.9%	75.0%
	2024	224	33.0%	71.9%	30.4%	74.6%

Note: This table reports the annual prevalence of variable and ST+LV lease expenses for the unbalanced (Panel A) and balanced (Panel B) full regression samples over 2019-2024.

Notably, neither variable nor ST+LV lease reporting frequency exhibits a clear directional trend over the sample period. The modest decline in variable lease prevalence in Panel A, from 32.7% in 2019 to 30.2% in 2024, is not mirrored in Panel B, where rates remain stable. Thus, the apparent decline in Panel A is likely driven by changes in sample composition, specifically the inclusion of firms with shorter reporting histories, rather than by a genuine reduction in variable lease prevalence over time. In the U.S. setting, Heese et al. (2025) document an increase in variable lease prevalence from slightly above 40% in 2019 to 50.1% in 2022. Two observations are worth noting in this regard.

The first observation is that our European sample exhibits lower prevalence throughout the period. Structural differences between the standards may be relevant here. Under ASC 842, changes in index- or rate-linked to on-balance variable leases do not always trigger a re-measurement of the lease liability. Additional payments are often instead recognised as variable lease expenses in the period they are incurred. Under IFRS 16, such changes trigger a re-measurement of the lease liability and flow through ROU asset depreciation and lease interest expenses instead (KPMG, 2025). This means the prevalence of variable

lease expenses is not fully comparable across the two settings. Furthermore, IFRS 16 offers a low-value asset exemption that has no direct equivalent under ASC 842 (KPMG, 2025), providing IFRS reporters with an additional avenue for non-capitalised lease treatment. Even so, the combined footprint of ST+LV expenses in our sample appears substantial. Adopters of this category outnumber variable lease adopters by a ratio of roughly 2:1 across the studied period. Moreover, for the median non-zero reporting firm-year, ST+LV expenses represent approximately 125% of variable leases. By contrast, short-term lease expenses make up less than 2% of variable lease expenses in the U.S. post-ASC 842 sample of Heese et al. (2025). Although the low-value exemption may explain part of this difference, the magnitude suggests that European IFRS reporters may rely more heavily on short-term leases than their U.S. counterparts.

The second observation concerns the absence of a rising trend in Europe. This suggests that the post-adoption increasing number of adopters recorded in the U.S. (Heese et al., 2025) is not similarly apparent for European IFRS 16 reporters. Whether this reflects differences in the standards themselves, in underlying market structures, or in the pace of firms' adoption responses lies beyond the scope of this study. As noted in the limitations, these figures may understate true prevalence, as several firms acknowledged the existence of variable lease arrangements without disclosing a specific amount (see Figures A2 and A3). Thus, observed differences may partly reflect disclosure gaps, consistent with the broader concerns regarding the adequacy of lease-related disclosures under the new standard (Davern et al., 2020; ICAEW, 2025).

A comparison of prevalence across geographical regions from 2019 to 2024 reveals cross-regional variation, as documented in Table B2. For variable leases, DACH & Benelux and the Nordics show the highest prevalence rates, averaging 38.6% and 36.4% of total firm-years respectively, although both decline over the period. UK & Ireland and Southern Europe exhibit the lowest prevalence rates, at 21.5% and 18.7%, and remain broadly stable. Central & Eastern Europe is the only region to show a notable increase, rising 4.8 percentage points from 28.6% to 33.3%. The regional ordering for ST+LV leases is broadly similar, but prevalence is uniformly higher, again consistent with the aggregate 2:1 ratio. These patterns may partly reflect country-level differences in leasing practices or IFRS enforcement across European jurisdictions. A year-by-year SIC division-level analysis was conducted but is not presented, as no systematic patterns were apparent. However, an aggregate breakdown by SIC division for the full sample period is provided in the appendix (Table B3).

6.1.3. Economic Significance

Among the ever-adopters of variable lease expenses, Table 4 examines their economic significance relative to capitalised lease expenses (*VarLease_Intensity*) and total assets

(*VarLease_Assets*), under both aggregate and equally weighted approaches.[29] Scaled by assets, variable lease expenses fluctuate but without a clear trend over the period, with the aggregate (equally weighted) varying between 0.11% (0.11%) and 0.18% (0.26%). Similarly, *VarLease_Intensity* on an aggregate basis increases modestly from 12.57% to 14.51%, suggesting limited change in the relative reliance at the sample level. However, the equally weighted ratio shows a more pronounced pattern, rising from 14.64% in 2019 to 24.82% in 2024, an increase of more than 1.5 times. This indicates that for the typical adopter, variable leases have grown meaningfully relative to capitalised lease expenses over the period. In contrast to the prevalence trends (see Section 6.1.2), this measure of intensity mirrors the increasing substitution away from on-balance operating leases to variable leases documented among U.S. firms (Heese et al., 2025; Yoon, 2021), and Christensen et al.'s (2025) broader interpretation of potential restructurings in U.S. lease portfolios. This interpretation is further supported by a within-firm time trend regression (Table B4). The results show statistically significant increases in the ratio in 2022, 2023, and 2024 relative to the omitted 2019 benchmark, consistent with a gradual intensification of variable lease adoption among firms already reporting such payments, rather than an uptake across additional firms.[30]

Table 4. Variable Lease Expense Scale and Intensity by Year, Ever-Adopters

Years	Firm-years (n)	Aggregate		Equally weighted	
		VarLease_ Intensity	VarLease_ Assets	VarLease_ Intensity	VarLease_ Assets
2019	83	12.57%	0.15%	14.64%	0.17%
2020	84	8.46%	0.11%	14.52%	0.11%
2021	85	12.72%	0.13%	20.09%	0.14%
2022	85	17.41%	0.18%	24.71%	0.26%
2023	85	17.22%	0.18%	29.47%	0.22%
2024	85	14.51%	0.16%	24.82%	0.19%

Note: This table reports the economic significance of variable lease expenses by year, restricted to ever-variable lease adopters, expressed as both aggregate and equally weighted ratios of variable lease expense to total assets and to capitalised lease expenses

6.1.4. Firm Characteristics Associated with Variable Lease Adoption

To investigate whether firm characteristics are associated with both the incidence and intensity of variable lease adoption, we first verify that multicollinearity is not a concern. Correlations are reported in Table B6, and Variance Inflation Factor ("VIF") diagnostics in Table B5 Columns (1) and (2). In terms of the main specification, the correlations are

[29] The aggregate approach computes the ratio using the sum of all firms' values. The equally weighted approach first computes the ratio for each firm individually and then takes the mean across the ratios.
[30] The pattern is robust to an untabulated regression using the balanced sample of ever-adopters (82 firms, 492 firm-years), with the exception that 2020 also yields a negative, statistically significant coefficient ($p<0.10$)

generally low to modest. The highest Pearson (Spearman) correlations are between *ROA* and *Loss* at -0.65 (-0.60) and *ROA* and *Div* at 0.55 (0.60), all significant at the 1% level, likely reflecting an artefact of their accounting relationships rather than problematic multicollinearity. This is supported by VIF values, which remain within acceptable bounds. The highest VIF is observed for *ROA*, at approximately 2.5 in Model (2) and 2.7 in Model (3), with none approaching the high threshold of ten (Wooldridge, 2013), or a more conservative benchmark of five.

Tables B7 and B8 present the panel association results for incidence and intensity, respectively. For incidence, *Ln_Size* is the most consistently significant predictor across all specifications, with a positive coefficient significant at the 1% level. *Ln_Leverage* is individually positively associated with the likelihood of reporting variable leases ($p<0.01$), while *Cash* is negatively associated ($p<0.01$). In the combined specification, *Ln_Leverage* is no longer significant, while *Cash* remains negatively associated, though at a lower significance level ($p<0.05$). This pattern holds with SIC fixed effects, where *Sales_Vol* also enters positively ($p<0.05$). Accordingly, larger, more operationally volatile firms with lower cash holdings appear to be more likely to report variable leases in a given year.[31] Beyond firm size, the results are broadly in line with the non-reporting channel emphasised by Caskey and Ozel (2019), who find that OBS operating lease adoption was associated with expanding financial capacity and accommodating volatile operations through more flexible contractual arrangements. For variable lease intensity, *Sales_Vol* is the only significant predictor in the individual specifications ($p<0.10$). Its coefficient remains positive but no longer statistically significant in the combined model, before re-emerging once SIC fixed effects are included ($p<0.05$), pointing to an association primarily identified within sector divisions. In the same specification, *ROA* enters with a significant negative coefficient ($p<0.10$). This is also consistent with Caskey and Ozel's (2019) finding that more profitable firms rely less on OBS operating leases, which they attribute to non-reporting incentives. Nevertheless, the overall explanatory power is low (Adj. R^2=0.164 for the full model with SIC FE), indicating that the firm characteristics alone explain modest variation in variable lease intensity.

Interestingly, ROU lease intensity (*Lease_Intensity)* is not statistically associated with either the annual likelihood of reporting variable lease expenses or the intensity of adoption among active-adopters.[32] Conceptually, the results do not directly conflict with Yoon (2021), who finds that lease-intensive firms are the primary drivers of OBS substitution under ASC 842. The author's setting captures a pre-post response to the standard implementation, using lease intensity as a broad measure of firms' exposure and opportunity to restructure with a difference-in-difference design. By contrast, our panel models examine whether lease intensity explains year-specific variation in variable lease

[31] Untabulated results show that this holds when defining leverage as *Ln_Debt_Assets.*

[32] See discussion on the mechanical relationship between variable lease and capitalised lease intensity in Section 6.2.1

adoption within a post-IFRS 16 period. Thus, while lease intensity does not appear to distinguish annual reporting behaviour on its own, it still remains a theoretically relevant conditioning variable for the scope of potential substitution.

Leverage (*Ln_Leverage*) is positively associated with the likelihood of reporting variable leases in a given year, which is directionally closer to classical PAT's prediction (Watts & Zimmerman, 1990) than the negative leverage pattern documented by Yoon (2021). However, the effect attenuates once other firm characteristics are included, and leverage is not significantly associated with intensity conditional on active adoption. Together, these results preclude a clean inference about reporting incentives based on leverage alone. More fundamentally, they do not resolve H1, as our hypothesis concerns not whether leverage affects variable lease adoption on average, but whether it moderates the behaviour of firms whose lease exposure makes the choice between fixed and variable lease structures economically meaningful. This distinction between H1a and H1b instead lies in the interaction between lease intensity and leverage, which we examine next.

6.2. Determinants of Variable Lease Adoption

Having established the descriptive patterns, we now turn to the competing theoretical predictions. H1a predicts that leverage amplifies the effect of lease intensity on variable lease adoption through debt covenant pressure (Watts & Zimmerman, 1990), while H1b predicts that highly leveraged firms lease out of operational necessity (Yoon, 2021) rather than reporting considerations. Before interpreting the regressions, we again confirm that all VIF values are within acceptable levels (Table B5). The leverage specifications are presented in Columns (3) and (4). The highest VIFs are for *Lease_Intensity^c,* at 3.36 in Model (4) and 3.98 in Model (5). The low-cash interaction specifications are presented in Columns (5) and (6). The highest VIFs are again for *Lease_Intensity^c,* at 2.64 in Model (6) and 2.72 in Model (7). Thus, multicollinearity does not appear to materially affect the regression estimates.

6.2.1. Leverage as a Moderator of Lease Intensity

Table 5 presents results for variable lease incidence in the full sample when *Ln_Leverage^c* is interacted with *Lease_Intensity^c*. While leverage is positively and significantly associated ($p<0.01$) with incidence in isolation, this effect attenuates when the broader set of controls enter the specification. This implies that the main effect of leverage partly reflects correlated firm attributes rather than an independent leverage channel. Lease intensity, by contrast, retains a positive and marginally significant effect ($p<0.10$) in the full model, both with and without SIC fixed effects. This implies that at mean leverage, firms with above-average on-balance lease exposure are more likely to adopt variable lease structures, consistent with the broader pattern documented by Yoon (2021). The interaction term is negative across all specifications but does not reach statistical significance. Taken together, the specification provides no robust evidence that

leverage, either independently or as a moderator of lease intensity, systematically predicts variable lease incidence.

Table 5. Variable Lease Incidence: Leverage Interaction

HasVarLease	Main effects	Interaction	Controls	SIC FE
Lease_Intensity^c t-1	0.244	1.91	5.68*	6.17*
	(1.84)	(2.94)	(3.30)	(3.66)
Ln_Leverage^c t-1	0.291***	0.278**	0.089	0.136
	(0.106)	(0.111)	(0.141)	(0.151)
Lease_Intensity^c t-1 x Ln_Leverage^c t-1		-0.968	-2.08	-2.21
		(1.43)	(1.51)	(1.58)
Firm Controls	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
SIC FE	No	No	No	Yes
Observations	1,176	1,176	1,176	1,176

Note: This table reports logistic regression results estimating whether the interaction between on-balance lease intensity and leverage predicts variable lease adoption. Clustered standard errors at the firm level are in parentheses. *, ** and *** indicate significance at the 10%, 5%, and 1% levels.

We examine the sensitivity of this conclusion by replacing logged debt-to-equity with two alternative leverage measures: *Debt_Assets* (untabulated) and *Ln_Debt_Assets* (Table C1). Both yield broadly similar main effect patterns as above, but the interaction term turns negative and significant at the 10% level in the full models. This suggests that the null result on the interaction may partly reflect measurement choice, and that under alternative leverage definitions, the positive relationship between lease intensity and variable lease adoption appears weaker at higher levels of leverage. This pattern sits in tension with the classical PAT prediction that leverage amplifies reporting incentives (Watts & Zimmerman, 1990). It is instead directionally consistent with Yoon (2021), who finds that substitution toward variable leases under ASC 842 is concentrated among less-leveraged firms, which is attributed to the dominance of operational factors rather than reporting incentives. Given the specification sensitivity, however, we do not treat the interaction as a robust finding.

Table 6 presents results on the intensity of variable lease adoption among the active-adopter subsample. Before discussing the coefficients, an interpretive note is warranted. Lease intensity is mechanically related to capitalised lease expense which forms the denominator of the dependent variable. A larger capitalised lease base (*Lease_Intensity)* increases the denominator of *Ln_VarLease_Intensity,* and unless variable lease expenses increase proportionally, the ratio declines. The concern is partially mitigated by the fact that independent variables are measured *t-1*. Still, the main effect of *Lease_Intensity* on *Ln_VarLease_Intensity* is therefore expected to carry a negative sign even absent of an

underlying economic behaviour. The interaction term is less directionally affected by this concern, because leverage itself does not enter the dependent variable, and any systematic variation in the interaction should therefore reflect an economic association rather than a ratio artefact. The interaction term is positive and significant at the 5% level in both the interaction-only and controls specifications, suggesting that the association between on-balance lease intensity and variable lease intensity strengthens as leverage increases. That is, higher leverage appears to mitigate the negative relationship between lease intensity and the dependent variable. This relationship, however, loses significance once SIC fixed effects are introduced. Whether this reflects sector-level leasing patterns being absorbed, or a loss in statistical power due to a limited sample size cannot be determined from the results alone.

Table 6. Variable Lease Intensity: Leverage Interaction

Ln_VarLease_Intensity	Main effects	Interaction	Controls	SIC FE
Lease_Intensity^c t-1	-0.581	-6.93*	-5.09	-0.863
	(2.96)	(3.81)	(4.11)	(4.91)
Ln_Leverage^c t-1	-0.091	-0.089	-0.280	-0.182
	(0.192)	(0.190)	(0.213)	(0.194)
Lease_Intensity^c t-1 x Ln_Leverage^c t-1		3.42**	2.98**	2.03
		(1.41)	(1.48)	(1.66)
Firm Controls	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
SIC FE	No	No	No	Yes
Observations	365	365	365	365
Adj. R2	0.005	0.042	0.061	0.172

Note: This table reports OLS regression results estimating whether the interaction between on-balance lease intensity and leverage predicts the intensity of variable lease adoption, measured as the logged ratio of variable-to-capitalised lease expense, among firm-years with non-zero variable leases. Clustered standard errors at the firm level are in parentheses. *, ** and *** indicate significance at the 10%, 5%, and 1% levels.

We assess the sensitivity of this result in two ways. First, replacing the leverage measure with debt-to-assets yields broadly consistent patterns.[33] The interaction term attains positive coefficients and reaches significance ($p<0.10$) prior to the inclusion of SIC fixed effects under the unlogged specification, and prior to controls under the logged specification. Second, we estimate an untabulated interaction specification using *Ln_VarLease_Assets* as an alternative dependent variable.[34] Across all specifications, lease intensity retains a negative main effect significant at the 1% level and is essentially

[33] *Debt_Assets* results are untabulated, *Ln_Debt_Assets* presented in Table C2.
[34] Estimated using centred 1) *Ln_Leverage*, 2) *Ln_Debt_Assets* and 3) *Debt_Assets*.

the only regressor with a statistically significant coefficient.[35] All in all, the results from scaling variable leases by assets as a measure of intensity appear to reflect a spurious ratio-on-ratio correlation between the dependent variable and *Lease_Intensity*. Hence, we refrain from drawing firm conclusions based on this specification.

Overall, the evidence from the preceding estimations is inconclusive. In the incidence model, the main specification provides a negative but statistically insignificant interaction effect, while alternative leverage definitions yield only weak evidence that leverage negatively moderates variable lease adoption among on-balance lease-intensive firms. In the intensity context, the interaction term is positive when variable leases are measured against capitalised lease expenses, suggesting that leverage may strengthen the association between lease exposure and relative adoption of variable lease expenses. However, this result is not robust to the inclusion of SIC fixed effects, nor is it reproduced consistently across leverage definitions.

One possible, but tentative, interpretation reconciling the differing signs of the interaction term between the incidence and intensity models is that leverage may operate differently across the two settings of decision-making. In the incidence context, higher leverage may constrain the likelihood that lease-intensive firms are able to obtain variable lease contracts in the first place, as lessors may be unwilling to bear performance or usage risk on behalf of a financially distressed counterparty. Conditional on having variable lease contracts in place, however, leverage may strengthen the incentive to rely more heavily on such structures relative to capitalised lease expenses. Nevertheless, this interpretation is only suggestive. Formally, the evidence does not fully support either hypothesis: the weak positive interaction in the intensity context is directionally consistent with H1a, while the weak negative interaction in the incidence context is directionally consistent with H1b, but neither effect is robust across specifications.

6.2.2. Cash Constraints as a Moderator of Lease Intensity

The ambiguity presented in Section 6.2.1 may not merely reflect an empirical inconvenience, but rather a consequence of the competing theoretical channels captured by leverage. As discussed in Section 4, View 1 predicts a positive interaction, whereas View 2 predicts a negative one. Since both forces are theoretically grounded, leverage may capture them simultaneously, making it too broad a proxy to distinguish cleanly between the channels. This motivates a shift toward a variable that more directly reflects one specific incentive source. Unlike leverage, which could simultaneously capture covenant pressure and financial constraint, low cash holdings provide a more direct measure of a firm's near-term capacity to meet fixed payment obligations. When liquidity is limited, variable lease payments are operationally attractive as they scale with the

[35] The sole exception is profitability in the full fixed-effects specification using *Ln_Leverage*, where the coefficient is negative and significant at the 1% level. Given the broader concern that this specification is mechanically driven, we do not attach interpretative weight to this result.

activity that generates the cash to fund them, a benefit that is independent of balance sheet indebtedness. We therefore interact lease intensity with a low-cash indicator as a more focused test of the operational channel.

Table 7. Variable Lease Incidence: Cash Constraint Interaction

HasVarLease	Main effects	Interaction	Controls	SIC FE
Lease_Intensity^c t-1	1.26	3.83	4.17	4.62
	(1.87)	(2.53)	(2.78)	(3.01)
Low_Cash t-1 (bottom quartile)	0.715***	0.746***	0.733***	0.706**
	(0.261)	(0.259)	(0.274)	(0.293)
Lease_Intensity^c t-1 x Low_Cash t-1 (bottom quartile)		-4.46	-4.27	-4.84
		(3.10)	(3.01)	(3.12)
Firm Controls	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
SIC FE	No	No	No	Yes
Observations	1,176	1,176	1,176	1,176

Note: This table reports logistic regression results estimating whether the interaction between on-balance lease intensity and a low-cash indicator predicts variable lease adoption. Clustered standard errors at the firm level are in parentheses. *, ** and *** indicate significance at the 10%, 5%, and 1% levels.

Table 7 presents the cash mechanism results for variable lease incidence. The coefficient on *Low_Cash* is positive and statistically significant at the 1% level in the main effects, interaction, and controls specifications, and remains significant at the 5% level once SIC fixed effects are included. This suggests that firms at average lease intensity with tighter liquidity positions are associated with a greater likelihood of adopting variable lease structures, consistent with the non-reporting incentive channel (Caskey & Ozel, 2019). By contrast, the interaction between lease intensity and low cash is not statistically significant in any specification. Overall, these results suggest that cash constraints are associated with variable lease adoption primarily through a direct main effect rather than by moderating the relationship between lease intensity and variable lease adoption.

Turning to intensity among active-adopters, Table 8 reveals a more nuanced pattern. At average lease intensity, low-cash firms exhibit a lower ratio of variable-to-capitalised lease expenses, suggesting that cash constraints alone do not systematically tilt firms toward variable structures. However, this effect is offset and eventually reverses when lease intensity increases, as indicated by the positive and significant interaction term ($p<0.05$, robust to SIC fixed effects). Thus, in firms with substantial on-balance lease exposure, cash constraints are associated with greater reliance on variable lease expenses. This pattern does not appear to be driven by broad sector compositions, though more granular industry effects within SIC divisions cannot be ruled out.

Compared to the findings from the leverage interaction models, the cash-based pattern is more stable across specifications. This aligns with previous discussions suggesting that

financial constraints, through an operational channel, incentivise heavier variable lease adoption, perhaps to accommodate limitations in meeting fixed lease payments. This is consistent with Caskey and Ozel's (2019) non-reporting incentive framework, which may also explain why low cash holdings, an arguably more direct measure of operational constraints, produce more stable results than leverage. This interpretation contrasts with the U.S. evidence of Ma and Thomas (2023), where post-ASC 842 substitution toward OBS structures was concentrated among firms with stronger reporting incentives.

Table 8. Variable Lease Intensity: Cash Constraint Interaction

Ln_VarLease_Intensity	Main effects	Interaction	Controls	SIC FE
Lease_Intensity^c t-1	-0.694	-5.35*	-3.26	-0.649
	(2.96)	(2.80)	(3.20)	(3.36)
Low_Cash t-1 (bottom quartile)	-0.694**	-0.775***	-0.797***	-0.779***
	(0.282)	(0.276)	(0.267)	(0.232)
Lease_Intensity^c t-1 x Low_Cash t-1 (bottom quartile)		8.54**	7.61**	7.14**
		(3.35)	(3.25)	(3.04)
Firm Controls	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
SIC FE	No	No	No	Yes
Observations	365	365	365	365
Adj. R2	0.044	0.078	0.099	0.205

Note: This table reports OLS regression results estimating whether the interaction between on-balance lease intensity and a low cash indicator predicts the intensity of variable lease adoption, measured as the logged ratio of variable-to-capitalised lease expense, among firm-years reporting non-zero variable lease expenses. Clustered standard errors at the firm level are in parentheses. *, ** and *** indicate significance at the 10%, 5%, and 1% levels.

6.3. Heavy-Adopters of Variable Leases

To test whether the patterns documented in Section 6.2 are driven by a subset of firms with intensive variable lease adoption, we distinguish heavy variable lease adopters and re-examine the competing predictions of H1a and H1b. However, the limited sample size of heavy-adopters warrants caution in drawing conclusions based on these results.

First, we investigate the persistence of the heavy-adopter status over time. Table C3 presents the results. The heavy-adopter status is highly persistent: 86.2% of heavy-adopters in year *t-1* retain that status in year t. Relatedly, non-heavy active-adopters are almost entirely stable in that classification, with 95.9% remaining within their status from one year to the next. Panel B reinforces this picture at the annual level. Retention rates among prior heavy-adopters remain consistently high, ranging from 77.8% in 2021 to 100% in 2024. Thus, heavy variable lease adoption reflects a persistent structural choice, rather than only a transitory response to short-term conditions.

6.3.1. Determinants of Variable Lease Adoption Among Heavy-Adopters

To sharpen the test of H1, we re-estimate the leverage interaction models on the probability of being a heavy-adopter among active variable lease preparers. If variable leases serve as a strategic management tool, this effect should be most pronounced among firms for whom variable lease intensity is systematic rather than incidental. Table 9 presents the results. The interaction term is positive and significant at the 5% level in the interaction-only specification, retains significance at the 10% level when controls are added, and loses significance when SIC fixed effects are included. As a robustness check, substituting *Ln_Leverage* with *Ln_Debt_Assets* yields significance only at the 10% level when controls are included (Table C4). The results are therefore broadly in line with the intensity findings in Section 6.2.1, directionally supporting H1a but remaining fragile to SIC division controls and leverage definitions.[36]

Table 9. Heavy Adoption Probability: Leverage Interaction

Heavy_Year	Main effects	Interaction	Controls	SIC FE
Lease_Intensity^c t-1	0.255	-10.3	-8.45	-1.47
	(4.69)	(6.88)	(7.60)	(8.39)
Ln_Leverage^c t-1	-0.036	-0.007	-0.181	-0.144
	(0.290)	(0.301)	(0.320)	(0.353)
Lease_Intensity^c t-1 x Ln_Leverage^c t-1		5.20**	5.17*	3.98
		(2.52)	(2.76)	(2.86)
Firm Controls	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
SIC FE	No	No	No	Yes
Observations	365	365	365	360

Note: This table reports logistic regression results estimating whether the interaction between on-balance lease intensity and leverage predicts the probability of being a heavy-adopter of variable leases. Clustered standard errors at the firm level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

Given the sensitivity of the leverage interaction, we additionally examine whether cash constraints produce a more robust pattern in the heavy-adopters' context. Table 10 presents the results. The pattern mirrors the full sample findings in Section 6.2.2. The interaction between lease intensity and low cash is positive and significant at the 1% level when first introduced, declines to the 5% level in the full model, and returns to 1% when SIC fixed effects are included. The robustness of these results reinforces the interpretation that liquidity constraints, rather than debt-based incentives, are the stronger moderator of variable lease intensity among the active-adopters of variable lease structures.

[36] Untabulated analysis redefining heavy-adopters as the top third yields broadly similar results, while significance diminishes when using the top quintile, potentially reflecting the reduction in sample size as the threshold tightens.

Table 10. Heavy Adoption Probability: Cash Constraint Interaction

Heavy_Year	Main effects	Interaction	Controls	SIC FE
Lease_Intensity^c t-1	0.736	-9.89	-7.97	-3.93
	(5.06)	(6.76)	(6.98)	(6.91)
Low_Cash t-1 (bottom quartile)	-1.05**	-1.33***	-1.33***	-1.40***
	(0.431)	(0.495)	(0.497)	(0.519)
Lease_Intensity^c t-1 x Low_Cash t-1 (bottom quartile)		18.5***	17.6**	17.6***
		(7.11)	(7.08)	(6.30)
Firm Controls	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
SIC FE	No	No	No	Yes
Observations	365	365	365	360

Note: This table reports logistic regression results estimating whether the interaction between on-balance lease intensity and a low cash indicator predicts the probability of being a heavy-adopter of variable leases. Clustered standard errors at the firm level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

Taken together, the evidence across Sections 6.2 and 6.3 tells a consistent story. The leverage interaction, the central test of the competing predictions of H1a and H1b, fails to survive across specifications and SIC fixed effects, providing no robust support for either hypothesis. Yet the absence of a leverage effect does not rule out the presence of an operational channel. The exploratory cash tests across the intensity specifications yield a more stable pattern. Where H1b frames operational constraints in terms of leverage, the cash-to-assets evidence points to a more direct mechanism: firms with heavy lease exposure and limited liquidity appear to tilt toward variable structures, perhaps to preserve flexibility in meeting fixed obligations as they come due. The weight of evidence therefore favours operational financial constraints, consistent with the spirit of H1b (Yoon, 2021) and the findings of Caskey and Ozel (2019), over classical PAT, as the primary explanation for variable lease adoption in the IFRS 16 setting.

6.4. Measurement Reliability and Recognition

The preceding analysis suggests that variable lease adoption is associated with operational financial constraints, captured through low cash holdings, rather than with leverage-based incentives. However, whether firms lean toward these structures to affect reported accounting outcomes or for ordinary business reasons (Fields et al., 2001) is arguably a secondary question. The standard-setter's justification for excluding variable lease payments from capitalisation rests partly on the premise that such payments are difficult to estimate (IASB, 2016c). For this argument to be valid, variable lease payments should exhibit lower persistence, weaker predictability, and greater sensitivity to changes in firm activity than other lease expenses (Heese et al., 2025). Evidence consistent with

these properties would support OBS-16 treatment on measurement grounds, regardless of what incentives drive variable lease adoption. We therefore test the three properties (H2a, H2b, H2c), comparing variable lease payments with other lease expense categories.

6.4.1. Persistence and Predictability

Table 11. Persistence Across Lease Expense Categories

	(1) Ln_Var Lease	(2) Ln_STLV Lease	(3) Ln_Cap Lease	(4) Ln_Var Lease	(5) Ln_STLV Lease	(6) Ln_Cap Lease
Ln_VarLease t-1	0.927***			0.894***		
	(0.021)			(0.027)		
Ln_STLVLease t-1		0.970***			0.939***	
		(0.010)			(0.021)	
Ln_CapLease t-1			0.980***			0.959***
			(0.004)			(0.009)
Firm Controls	No	No	No	Yes	Yes	Yes
Firm FE	No	No	No	No	No	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	362	837	1,195	362	837	1,195
Adj. R2	0.900	0.923	0.987	0.901	0.924	0.988

Note: This table reports OLS regression results estimating the persistence of variable, ST+LV, and capitalised lease expenses by regressing the log of each lease category on its one-year lag. Columns 1-3 exclude firm-level controls; columns 4-6 include them. Clustered standard errors at the firm level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

The persistence results are reported in Table 11. All lease categories exhibit high and statistically significant persistence throughout. Variable lease payments show a persistence coefficient of 0.894 (0.927) with (without) controls ($p<0.01$), indicating that the prior year's variable lease expense is a strong predictor of the current year's. ST+LV and capitalised lease expense exhibit similarly high persistence, with capitalised lease expense showing the highest coefficient of 0.959 (0.980) with (without) controls ($p<0.01$). The explanatory power across all specifications ($R^2>0.9$) supports that lagged lease expenses explain most of the variation in all categories.[37] While variable lease payments are the least persistent of the three categories, the differences are modest and all categories remain highly persistent, a finding that is difficult to reconcile with the standard-setter's premise that variable lease payments are inherently too uncertain to estimate. Furthermore, our results align with Heese et al. (2025), who document high persistence for variable lease expenses in the U.S. setting, and offer only modest support for H2a. Direct cross-category comparisons should nonetheless be interpreted with caution, as each category is estimated on its own active-adopters subsample, with 362 observations for variable leases versus 1,195 for capitalised lease expense.[38]

[37] We find similar results without winsorising the variables, see Table D1.

[38] We additionally test persistence over two- and three-year horizons. The two-year persistence test is shown in Table D2, and the three-year is untabulated; both confirm that the high persistence documented here is robust to longer lag structures.

Turning to predictability, Table 12 reports pairwise comparisons of mean squared forecast errors from a naïve random-walk benchmark. Variable lease payments generate higher forecast errors than capitalised lease expense, with a positive MSE difference of 0.090 ($p<0.05$), while ST+LV leases similarly show higher errors than capitalised lease expense at 0.026 ($p<0.01$). No significant difference emerges in predictability between variable and ST+LV leases; hence H2b only receives partial support. Nevertheless, the comparison most relevant to the IASB's estimation difficulty argument is between variable and capitalised lease expenses. Here, our evidence, consistent with Heese et al. (2025), shows that while variable lease payments are harder to forecast, it is not to an extent that would render them inherently inestimable.[39]

Table 12. Predictability Across Lease Expense Categories

	(1) VarLease - STLVLease	(2) VarLease - CapLease	(3) STLVLease - CapLease
MSE Diff	0.052	0.090**	0.026***
	(0.043)	(0.038)	(0.007)
Observations	396	421	916
RMSE Diff	0.085	0.181	0.081

Note: This table reports pairwise comparisons of mean squared errors from a naïve random-walk benchmark across variable, ST+LV and capitalised lease expenses. RMSE differences are reported as a supplementary measure of economic magnitude. Clustered standard errors at the firm level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

6.4.2. Revenue Responsiveness

Revenue responsiveness is reported in Table 13. Variable lease payments exhibit the highest revenue elasticity, with a coefficient of 0.953 (0.811) with (without) controls ($p<0.01$). This implies that a 1% increase in revenue corresponds to a 0.81-0.96% increase in variable lease expenses. Although all categories are positively and significantly associated with revenue, ST+LV leases show a weaker relationship at 0.364 (0.277), while capitalised lease expenses are the least responsive at 0.154 (0.241) with (without) controls. The ordering provides clear support for H2c: variable lease structures are more tied to firm-level economic activity than other lease types. When lagged revenue is used instead (Table D4), only variable and capitalised leases retain significance, with variable lease elasticity roughly halved. Thus, sensitivity fades as the revenue signal ages.[40] For large discrete revenue shocks (Tables D5 and D6), we find that lease expenses are unresponsive, with the only notable exception being a decline in capitalised leases during large revenue increases. Accordingly, all lease categories exhibit some association with revenue, but the association is weaker for sudden fluctuations.

[39] The two-year predictability horizon is estimated in Table D3, and the three-year horizon in an untabulated test; both yield qualitatively consistent conclusions.

[40] Untabulated analysis shows similar results as with contemporaneous revenue when testing for 2-year average revenue.

Table 13. Responsiveness to Revenue Across Lease Expense Categories

	(1) Var Lease	(2) STLV Lease	(3) Cap Lease	(4) Var Lease	(5) STLV Lease	(6) Cap Lease
Ln_Revenue	0.811***	0.277*	0.241***	0.953***	0.364**	0.154***
	(0.194)	(0.145)	(0.066)	(0.256)	(0.166)	(0.050)
Firm Controls	No	No	No	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	443	1,025	1,446	443	1,025	1,446
Adj. R2	0.924	0.924	0.985	0.924	0.924	0.987

Note: This table reports OLS regression results estimating the revenue elasticity of variable, ST+LV, and capitalised lease expenses. The dependent variable is the log of each lease category. Columns 1-3 exclude firm-level controls and columns 4-6 include them. Clustered standard errors at the firm level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

The most salient difference between variable leases in our European IFRS 16 sample and U.S. contexts lies in their revenue sensitivity. Heese et al. (2025) document that under ASC 842, a 1% increase in revenue corresponds to only approximately a 0.135% increase in variable lease payments, with no meaningful difference in sensitivity between variable and other lease categories. This stands in marked contrast to the IFRS 16 evidence presented here. One possible mechanical explanation concerns differences in what is captured under the variable lease label under the two regimes. As discussed in Section 6.1.2, under ASC 842, index- or rate-linked payments flow through the variable lease line item when they exceed the amount originally embedded in the lease liability (KPMG, 2025). IFRS 16 disclosures are therefore, in principle, a cleaner proxy for genuinely performance-linked payments. Whether this divergence also reflects substantive differences in the underlying economics of lease contracts cannot be determined without access to individual lease agreements, which lies beyond the scope of this study.

Taken together, the evidence across all three dimensions offers partial support for H2. The strongest evidence comes from revenue responsiveness (H2c), while predictability (H2b) provides more limited support and persistence (H2a) appears to be the weakest dimension. The combination of high persistence and strong revenue co-movement is not contradictory; variable lease payments that closely track revenues inherit their persistence, reflecting the stability of the underlying economic activity rather than the lease structure itself (Heese et al., 2025). The IASB's rationale for their exclusion is therefore difficult to sustain. While variable leases are less predictable than capitalised lease expenses, their high persistence means current variable lease expenses remain a reasonable basis for estimating future commitments. Estimation errors in near-term lease payments matter far more for the measured liability than errors at longer horizons, since discounting shrinks the contribution of distant cash flows (Heese et al., 2025). What matters for recognition is therefore not the accuracy of long-horizon forecasts, but whether firms can estimate the next few years with reasonable accuracy, which is what our evidence suggests.

6.4.3. Estimated Variable Lease Liabilities

A natural follow-up concerns what recognising variable lease payments on the balance sheet would mean for reported leverage. Following Heese et al. (2025), we estimate a variable lease liability for our European sample. Before doing so, we verify that *VarLease_Intensity* exhibits appropriate anchoring properties. Table D7 reports tests for persistence, revenue responsiveness, and responsiveness to large revenue drops. The ratio is highly persistent, shows no significant relationship with revenue, and does not react to large revenue declines, supporting its use for the liability estimation. Table 14 reports the estimated variable lease liability for the full ever-adopter sample and by geography. Capitalising variable lease payments would increase total debt by 2.8% on average (0.5% at the median). The aggregate effect masks substantial geographic variation; Southern European firms would see total debt rise by 6.3%, followed by the Nordics at 3.7%.[41]

All in all, the findings paint a consistent picture. Variable lease payments exhibit statistical properties that are more systematic than the IASB's measurement rationale would imply, and the resulting liabilities, though modest on average, are economically significant in parts of the European market. The IASB's decision to exclude this type of variable lease from the balance sheet therefore understates both the feasibility of recognition and its relevance for how leverage is measured across jurisdictions.

Table 14. Estimated Variable Lease Liabilities

	Firms	Firm-years	Mean est. VarLease	Median est. VarLease
Southern Europe	10	60	6.3%	0.7%
Nordics	27	156	3.7%	1.2%
DACH & Benelux	33	198	1.8%	0.4%
UK & Ireland	11	65	0.9%	0.1%
Central & Eastern Europe	5	28	0.7%	0.2%
Total	86	507	2.8%	0.5%

Note: This table reports estimated variable lease liabilities and their impact on total reported debt if capitalised, for total variable lease adopters and broken down by European region.

[41] When instead computing the estimated variable lease liability using a firm-specific minimum ratio, untabulated results show a total debt increase of 1.5% on average.

7. Conclusions

This study examines variable lease payments under IFRS 16 using hand-collected data from 251 European listed firms between 2019 and 2024, filling an existing gap in the literature and contributing to the IASB's ongoing Post-implementation Review. Our findings address three questions: how prevalent are variable leases, what incentivises their adoption, and whether their statistical properties justify their exclusion from lease liability measurement?

Roughly one-third of firms report variable lease expenses, a rate that remains stable over the period, in contrast to the rising incidence documented in the U.S. under ASC 842 (Heese et al., 2025). Despite stable incidence, the relative intensity among adopters increases, with within-firm trend regressions showing significant increases in the variable-to-capitalised lease expense ratio from 2022 onwards. A distinct group of heavy-adopters accounts for a large share of variable lease activity, demonstrating persistence in their classification over time. This suggests that intensive variable lease structuring is a stable firm-level characteristic rather than an occasional choice.

Turning to drivers, the leverage interaction with on-balance lease intensity is directionally positive in baseline specifications but consistently fails to survive alternative specifications and SIC fixed effects. Thus, we find no robust evidence that this interaction predicts variable lease adoption. To explore whether leverage simultaneously captures reporting incentives and operational necessity, we conduct exploratory tests using a low-cash indicator to better isolate operational pressure. These results yield a more stable pattern across specifications, implying that lease-intensive firms with limited cash-to-assets are associated with relatively higher variable leases, and a higher likelihood of being a heavy-adopter. While exploratory and suggestive, the findings are broadly consistent with the spirit of H1b, indicating that operational financial constraints, rather than balance sheet reporting incentives, are the most plausible driver of variable lease structuring in the IFRS 16 setting.

Finally, we examine whether variable lease payments exhibit properties that justify their OBS-16 treatment. Variable leases respond significantly to revenue, whereas other categories do not, consistent with the IASB's premise that these payments are tied to future activity. Moreover, predictability is lower for variable leases than that of capitalised lease expenses. However, they remain highly persistent. The measurement-reliability case for exclusion is therefore more nuanced than the IASB's reasoning implies. Variable leases are activity-linked, but not necessarily unreliable. Their high persistence suggests that trailing expense provides a workable basis for near-term estimation, the horizon most relevant for present value measurement. We therefore encourage the IASB to investigate whether variable lease expenses linked to future

performance or usage could be incorporated into liability measurement through approaches anchored in recent expense levels rather than long-horizon forecasts.

While our study provides an important first step in understanding OBS-16 variable lease payments, several areas remain outside its scope and offer opportunities for future research. First, it would be valuable to examine a larger sample, increasing statistical power and enabling more granular industry-level analysis. Second, building on prior studies (Heese et al., 2025; Ma & Thomas, 2023; Yoon, 2021), future research could investigate whether IFRS 16 prompted a shift from operating and finance leases towards variable lease structures through a pre-post study design. While proxies can be noisy (see Section 5.1), further evidence on whether substitutions occurred at implementation remains an interesting area for exploration. Third, additional work could examine underlying lease contracts directly to understand how payment terms are structured in practice. Fourth, future research could also explore whether capital markets price variable lease obligations. Finally, our research briefly highlights the substantial incidence of short-term lease expenses among European IFRS reporters. As firms may structure contracts below 12 months to avoid capitalisation (Comiran et al., 2022), it offers a relevant avenue for future research.

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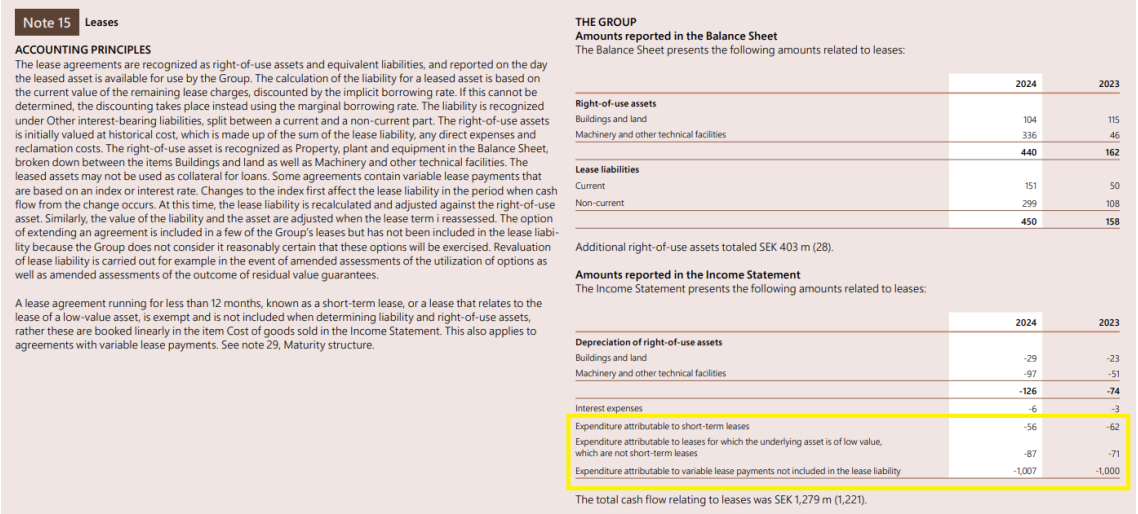
9. Appendix

9.1. Appendix A: Supporting Material

Figure A1. Example of a company that clearly and fully discloses leasing information



Note 15 Leases

ACCOUNTING PRINCIPLES

The lease agreements are recognized as right-of-use assets and equivalent liabilities, and reported on the day the leased asset is available for use by the Group. The calculation of the liability for a leased asset is based on the current value of the remaining lease charges, discounted by the implicit borrowing rate. If this cannot be determined, the discounting takes place instead using the marginal borrowing rate. The liability is recognized under Other interest-bearing liabilities, split between a current and a non-current part. The right-of-use assets is initially valued at historical cost, which is made up of the sum of the lease liability, any direct expenses and reclamation costs. The right-of-use asset is recognized as Property, plant and equipment in the Balance Sheet, broken down between the items Buildings and land as well as Machinery and other technical facilities. The leased assets may not be used as collateral for loans. Some agreements contain variable lease payments that are based on an index or interest rate. Changes to the index first affect the lease liability in the period when cash flow from the change occurs. At this time, the lease liability is recalculated and adjusted against the right-of-use asset. Similarly, the value of the liability and the asset are adjusted when the lease term i reassessed. The option of extending an agreement is included in a few of the Group's leases but has not been included in the lease liability because the Group does not consider it reasonably certain that these options will be exercised. Revaluation of lease liability is carried out for example in the event of amended assessments of the utilization of options as well as amended assessments of the outcome of residual value guarantees.

A lease agreement running for less than 12 months, known as a short-term lease, or a lease that relates to the lease of a low-value asset, is exempt and is not included when determining liability and right-of-use assets, rather these are booked linearly in the item Cost of goods sold in the Income Statement. This also applies to agreements with variable lease payments. See note 29, Maturity structure.

THE GROUP

Amounts reported in the Balance Sheet

The Balance Sheet presents the following amounts related to leases:

	2024	2023
Right-of-use assets		
Buildings and land	104	115
Machinery and other technical facilities	336	46
	440	**162**
Lease liabilities		
Current	151	50
Non-current	299	108
	450	**158**

Additional right-of-use assets totaled SEK 403 m (28).

Amounts reported in the Income Statement

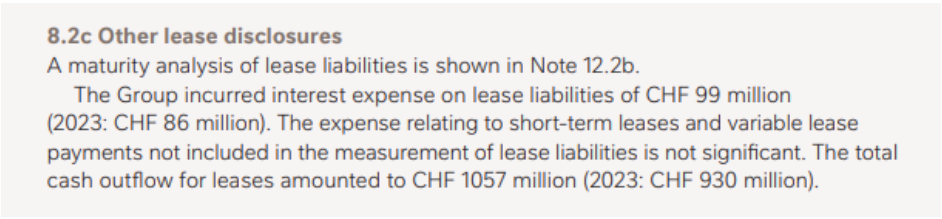
The Income Statement presents the following amounts related to leases:

	2024	2023
Depreciation of right-of-use assets		
Buildings and land	-29	-23
Machinery and other technical facilities	-97	-51
	-126	**-74**
Interest expenses	-6	-3
Expenditure attributable to short-term leases	-56	-62
Expenditure attributable to leases for which the underlying asset is of low value, which are not short-term leases	-87	-71
Expenditure attributable to variable lease payments not included in the lease liability	-1,007	-1,000

The total cash flow relating to leases was SEK 1,279 m (1,221).

Note: The figure shows part of the Leases note from Boliden's 2024 annual report (Note 15: Leases, p. 151) as an example of a company providing high-quality OBS-16 lease expense information.

Figure A2. Example of a company that does not fully disclose leasing information



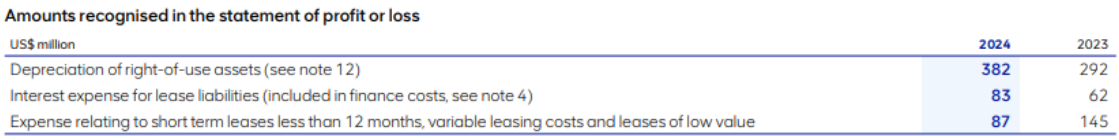
8.2c Other lease disclosures

A maturity analysis of lease liabilities is shown in Note 12.2b.

The Group incurred interest expense on lease liabilities of CHF 99 million (2023: CHF 86 million). The expense relating to short-term leases and variable lease payments not included in the measurement of lease liabilities is not significant. The total cash outflow for leases amounted to CHF 1057 million (2023: CHF 930 million).

Note: The figure shows a part of the Leases note from Nestlé's 2024 financial statements (Note 8.2c Other lease disclosures, p. 110) as an example of a company providing low-quality OBS-16 lease expense information.

Figure A3. Example of a company that does not clearly disclose leasing information



Amounts recognised in the statement of profit or loss

US$ million	2024	2023
Depreciation of right-of-use assets (see note 12)	**382**	292
Interest expense for lease liabilities (included in finance costs, see note 4)	**83**	62
Expense relating to short term leases less than 12 months, variable leasing costs and leases of low value	**87**	145

Note: The figure shows a part of the Leases note from Anglo American Plc's 2024 annual report (Note 23: Leases, p. 270) as an example of a company providing low-quality OBS-16 lease expense information.

Table A1. Variable Description

Variable	Description	Source
Dependent variables		
HasVarLease	Binary indicator equal to 1 if firm i reports non-zero variable lease expenses (*VarLease*) in year t.	Constructed.
VarLease_ Intensity	Variable lease expenses (*VarLease*) divided by capitalised lease expenses (*CapLease*) in year t.	Constructed.
Ln_VarLease_ Intensity	Natural logarithm of *VarLease_Intensity* in year t.	Constructed.
VarLease_ Assets	Variable lease expenses (*VarLease*) divided by assets (*Assets*) in year t.	Constructed.
Ln_VarLease_ Assets	Natural logarithm of *VarLease_Assets* in year t.	Constructed.
Heavy_ Year	Binary indicator equal to 1 if the firm-year observation falls into the top quartile of *VarLease_Intensity* among active variable lease adopters in year t. Robustness specification changes the threshold to top third and top quintile.	Constructed.
Ln_CapLease	Natural logarithm of *CapLease*.	Constructed.
Ln_VarLease	Natural logarithm of *VarLease*.	Constructed.
Ln_STLVLease	Natural logarithm of *STLVLease*.	Constructed.
Ln_Lease	Represents *Ln_CapLease, Ln_VarLease and Ln_STLVLease* respectively.	Constructed.
Lease and lease intensity variables		
ROU	Net right-of-use asset as recorded on the balance sheet in year t.	Manual data collection.
Lease_Liab	Defined as the sum of current and non-current lease liabilities as recorded on the balance sheet in year t.	Manual data collection.
CapLease	Defined as the sum of depreciation of ROU assets and interest expense on lease liabilities in year t.	Manual data collection.
VarLease	Variable lease expenses not included in the measurement of the lease liability in year t.	Manual data collection.
STLVLease	Sum of short-term expenses and expenses relating to leases of low-value underlying assets not included in the measurement of the lease liability in year t.	Manual data collection.
NonCap Lease	Combined non-capitalised lease expenses (*VarLease* + *STLVLease*) in year t.	Constructed.
Lease_ Intensity	Net-ROU assets (*ROU*) divided by total assets (*Assets*) measured in year t.	Constructed
Lease_ Intensity^c	*Lease_Intensity* centred at the full regression-sample mean.	Constructed

Other explanatory variables and controls		
Assets	Total assets in year t.	Capital IQ: data item "IQ_TOTAL_ASSETS".
Ln_Size	Natural logarithm of *Assets* in year t	Constructed.
Ln_Revenue	Natural logarithm of total revenue in year t.	Capital IQ: data item "IQ_TOTAL_REV"
Sales_Vol	Rolling three-year standard deviation of the natural logarithmic revenue (*Ln_Revenue*) growth rates. When measured as t-1, year t is not included.	Constructed
Cash	Cash and cash equivalents divided by total assets at year t.	Capital IQ: data item "IQ_CASH_EQUIV" and "IQ_TOTAL_ASSETS".
Low_Cash	Binary indicator equal to 1 if *Cash* falls in the bottom quartile of the full unbalanced regression sample. Cutoff is computed once on the pooled sample.	Constructed
ROA	Net income divided by total assets in year t.	Capital IQ: data item "IQ_TOTAL_NI" and "IQ_TOTAL_ASSETS".
Div	Total dividends divided by total assets in year t.	Capital IQ: data item "IQ_TOTAL_DIV_PAID_CF" and "IQ_TOTAL_ASSETS".
Loss	Binary indicator equal to 1 if net income in year t is negative.	Capital IQ: data item "IQ_TOTAL_NI"
Large_ Decline	Binary indicator equal to 1 for firm-years in the bottom decile of revenue changes. Cutoff computed either pooled across all years, or within each fiscal year.	Constructed.
Large_ Increase	Binary indicator equal to 1 for firm-years in the top decile of revenue changes. Cutoff computed either pooled across all years, or within each fiscal year.	Constructed.
Ln_ Leverage	Natural logarithm of total debt divided by total equity in year t.	Capital IQ: data item "IQ_TOTAL_DEBT" and "IQ_TOTAL_EQUITY".
Ln_ Leverage^c	*Ln_Leverage* centred at the full regression-sample mean.	Constructed
Debt_Assets	Total debt divided by total assets in year t.	Capital IQ: data item "IQ_TOTAL_DEBT" and "IQ_TOTAL_ASSETS".
Ln_Debt_ Assets	Natural logarithm of *Debt_Assets*.	Constructed.
Ln_Debt_ Assets^c	*Ln_Debt_Assets* centred at the full regression-sample mean.	Constructed.
Year	Fiscal year indicator variables for 2020-2024, with 2019 omitted as the reference year.	Constructed.

Note: This table provides definitions and sources for the main regression variables. Variables are defined in their contemporaneous form, although empirical models may use lagged versions at t-1, t-2 and t-3 depending on the specification.

9.2. Appendix B: Descriptive Statistics

Table B1. Total Summary Statistics: Regression Variables

Variable	N	Mean	SD	P_{10}	P_{25}	P_{50}	P_{75}	P_{90}
Ln_Size t-1	1,445	8.14	1.70	5.99	7.01	8.09	9.19	10.56
Ln_Size t	1,446	8.23	1.66	6.14	7.08	8.17	9.27	10.58
Lease_Intensity t-1	1,195	0.06	0.07	0.01	0.02	0.03	0.06	0.13
Ln_Leverage t-1	1,413	-0.65	1.26	-2.24	-1.14	-0.47	0.08	0.61
Debt_Assets t-1	1,445	0.27	0.16	0.05	0.14	0.25	0.37	0.48
Ln_Debt_Assets t-1	1,432	-1.60	0.94	-2.78	-1.92	-1.38	-1.00	-0.74
Ln_Debt_Assets t	1,446	-1.59	0.92	-2.71	-1.92	-1.37	-0.98	-0.74
Cash t-1	1,445	0.12	0.11	0.02	0.04	0.08	0.15	0.24
Low_Cash t-1	1,445	0.25	0.43	0.00	0.00	0.00	1.00	1.00
ROA t-1	1,445	0.05	0.08	-0.02	0.02	0.05	0.08	0.13
ROA t	1,446	0.05	0.08	-0.02	0.02	0.04	0.08	0.12
Loss t-1	1,445	0.14	0.35	0.00	0.00	0.00	0.00	1.00
Div t-1	1,445	0.02	0.03	0.00	0.00	0.02	0.03	0.06
Sales_Vol t-1	1,430	0.17	0.22	0.02	0.05	0.10	0.19	0.36
Ln_Revenue t	1,446	7.82	1.68	5.89	6.69	7.83	8.89	9.96
HasVarLease t	1,446	0.31	0.46	0.00	0.00	0.00	1.00	1.00
VarLease t	1,446	9.88	55.54	0.00	0.00	0.00	0.53	10.81
Ln_VarLease t	450	1.18	2.30	-1.75	-0.24	1.03	2.85	4.21
STLVLease t	1,446	21.91	70.48	0.00	0.00	1.28	9.95	50.85
Ln_STLVLease t	1,029	1.42	2.24	-1.39	-0.07	1.49	2.94	4.42
CapLease t	1,446	123.20	246.83	3.46	9.30	35.17	106.38	327.20
Ln_CapLease t	1,446	3.45	1.79	1.24	2.23	3.56	4.67	5.79
VarLease_Intensity t [42]	507	0.21	0.93	0.00	0.01	0.04	0.13	0.37
Ln_VarLease_Intensity t	450	-3.05	1.69	-5.05	-4.23	-3.12	-1.91	-0.92
VarLease_Assets t [42]	507	0.002	0.005	0.000	0.000	0.000	0.001	0.003
Ln_VarLease_Assets t	450	-7.66	1.73	-9.86	-8.94	-7.68	-6.42	-5.66

Note: This table shows winsorised summary statistics for the variables used in the main specifications in Section 6, due to the lagged/logged nature of certain variables, some show N < 1,446. Statistics reported are the number of observations, mean, standard deviation, and the 10th, 25th, 50th, 75th and 90th percentiles

Table B2. Prevalence of OBS Lease Expenses by Region and Year

	Region	2019	2024	Δ	Average
% with variable lease	Nordics	38.5%	33.8%	-4.7%	36.4%
	DACH & Benelux	42.5%	38.7%	-3.8%	38.6%
	UK & Ireland	20.0%	21.1%	1.1%	21.5%
	Southern Europe	18.2%	18.4%	0.2%	18.7%
	Central & Eastern Europe	28.6%	33.3%	4.8%	31.7%
% with ST+LV lease	Nordics	83.1%	80.3%	-2.8%	81.0%
	DACH & Benelux	79.5%	82.7%	3.2%	80.7%
	UK & Ireland	66.7%	60.5%	-6.1%	66.0%
	Southern Europe	47.7%	49.0%	1.3%	47.4%
	Central & Eastern Europe	64.3%	66.7%	2.4%	65.9%

Note: This table reports the prevalence of variable and ST+LV lease expenses by European regions, showing the percentage of firm-years reporting each category in 2019, 2024, the change over the period and the sample average over time.

[42] Presented for ever-adopters.

Table B3. Sample distribution across SIC divisions

	Count (n)						Share of Division (%)		
SIC division	Firms	Firm-years	Ever-adopter firms	Ever-adopter firm-years	Active-adopter firm-years	Heavy-adopter firm-years	Ever-adopter firm-years	Active-adopter firm-years	Heavy-adopter firm-years
Wholesale Trade	11	64	5	30	30	2	46.9%	46.9%	6.7%
Manufacturing	124	711	45	264	239	80	37.1%	33.6%	33.5%
TCEGSS*	32	183	12	70	60	8	38.3%	32.8%	13.3%
Retail Trade	10	59	3	18	17	3	30.5%	28.8%	17.6%
Services	53	309	17	102	86	16	33.0%	27.8%	18.6%
Mining	9	49	3	17	12	6	34.7%	24.5%	50.0%
Construction	12	71	1	6	6	0	8.5%	8.5%	0.0%

Note: This table presents the distribution of sample firms across SIC divisions, reporting both counts (n) and percentages (%) relative to each division. Counts are reported for full sample firms and firm-years, ever-adopter firms and firm-years, and active and heavy-adopter firm-years. Percentages are calculated relative to the total number of observations within each SIC division.

* Refers to Transportation, Communications, Electric, Gas, and Sanitary Services

Table B4. Within-Firm Time Trends in Variable Lease Intensity

	VarLease_Intensity
Year_f = 2020	-0.016
	(0.011)
Year_f = 2021	0.025
	(0.018)
Year_f = 2022	0.061**
	(0.028)
Year_f = 2023	0.085*
	(0.044)
Year_f = 2024	0.086**
	(0.042)
Firm FE	Yes
Observations	507
Adj. R2	0.741

Note: This table reports within-firm time trend regression estimating whether the ratio of variable-to capitalised-lease expense has changed over the sample period with 2019 as the reference year. Clustered standard errors at the firm level are in parentheses. *, ** and *** indicate significance at the 10%, 5%, and 1% level.

Table B5. Variance Inflation Factors: Main Regression Specifications

Variable	(1) Model (2) Has_ VarLease	(2) Model (3) Ln_VarLease _Intensity	(3) Model (4) Has_ VarLease	(4) Model (5) Ln_VarLease _Intensity	(5) Model (6) Has_ VarLease	(6) Model (7) Ln_VarLease _Intensity
Ln_Size t-1	1.29	1.08	1.30	1.09	1.22	1.08
Lease_Intensity t-1	1.29	1.52	NA	NA	NA	NA
Lease_Intensity^c t-1	NA	NA	3.36	3.98	2.64	2.72
Ln_Leverage t-1	1.61	2.00	NA	NA	1.53	2.01
Ln_Leverage ^c t-1	NA	NA	1.79	2.01	NA	NA
Lease_Intensity^c t-1 * Ln_Leverage ^c t-1	NA	NA	2.83	3.47	NA	NA
Low_Cash t-1	NA	NA	NA	NA	1.08	1.08
Lease_Intensity^c t-1 * Low_Cash^c t-1	NA	NA	NA	NA	2.33	2.32
Cash t-1	1.29	1.14	1.30	1.16	NA	NA
Sales_Vol t-1	1.12	1.15	1.15	1.21	1.08	1.10
ROA t-1	2.47	2.70	2.47	2.70	2.48	2.72
Loss t-1	1.85	1.68	1.87	1.69	1.86	1.70
Div t-1	1.42	1.45	1.43	1.46	1.43	1.45

Note: This table reports VIFs for the main specifications. Column (1) and (2) report VIFs for the panel association models on variable lease incidence and intensity, respectively. Columns (3) and (4) report VIFs for the leverage interaction models on incidence and intensity, respectively. Columns (5) and (6) report VIFs for the low-cash interaction models on incidence and intensity, respectively. "NA" indicates that the variable is not included in the corresponding specification.

Table B6. Pairwise Correlations: Regression Variables

Correlation	Ln_Size t-1	Lease_Intensity t-1	Ln_Leverage t-1	Debt_Assets t-1	Ln_Debt_Assets t-1	Cash t-1	Low_Cash t-1	ROA t-1	Loss t-1	Div t-1	Sales_Vol t-1	HasVarLease t	Ln_VarLease_Intensity t	Ln_VarLease_Assets t
Ln_Size t-1	**1.00**	-0.20***	0.29***	0.22***	0.20***	-0.17***	0.04	-0.20***	-0.02	0.04	0.00	0.24***	0.02	-0.09*
Lease_Intensity t-1	-0.14***	**1.00**	0.25***	0.28***	0.28***	-0.06**	0.11***	-0.06*	0.03	-0.12***	-0.11***	0.13***	-0.20***	0.24***
Ln_Leverage t-1	0.29***	0.37***	**1.00**	0.91***	0.91***	-0.20***	0.12***	-0.41***	0.17***	-0.24***	0.03	0.12***	-0.11**	0.04
Debt_Assets t-1	0.18***	0.48***	0.85***	**1.00**	1.00***	-0.28***	0.17***	-0.33***	0.15***	-0.19***	0.04	0.14***	-0.10**	0.06
Ln_Debt_Assets t-1	0.26***	0.32***	0.93***	0.85***	**1.00**	-0.26***	0.17***	-0.32***	0.16***	-0.19***	0.03	0.13***	-0.10**	0.07
Cash t-1	-0.31***	-0.07**	-0.32***	-0.28***	-0.37***	**1.00**	-0.75***	0.08***	0.09***	-0.07***	0.14***	-0.19***	0.15***	0.16***
Low_Cash t-1	0.05*	0.17***	0.15***	0.17***	0.19***	-0.49***	**1.00**	-0.06**	-0.07***	0.03	-0.10***	0.14***	-0.16***	-0.19***
ROA t-1	-0.13***	-0.10***	-0.33***	-0.31***	-0.27***	-0.04	-0.04	**1.00**	-0.60***	0.60***	-0.15***	-0.02	-0.02	0.02
Loss t-1	-0.02	0.11***	0.14***	0.20***	0.09***	0.15***	-0.07***	-0.65***	**1.00**	-0.38***	0.21***	-0.05**	0.03	-0.00
Div t-1	-0.10***	-0.07**	-0.22***	-0.19***	-0.19***	-0.02	0.01	0.55***	-0.26***	**1.00**	-0.21***	0.06**	-0.02	0.01
Sales_Vol t-1	-0.04	0.05*	0.02	0.10***	-0.01	0.25***	-0.09***	-0.20***	0.25***	-0.15***	**1.00**	0.04	0.20***	0.12**
HasVarLease t	0.25***	0.07**	0.14***	0.12***	0.16***	-0.19***	0.14***	0.01	-0.05**	-0.02	0.02	**1.00**	NA	NA
Ln_VarLease_Intensity t	0.03	-0.07	-0.09*	-0.07	-0.11**	0.06	-0.17***	-0.00	0.03	-0.06	0.15***	NA	**1.00**	0.85***
Ln_VarLease_Assets t	-0.07	0.33***	0.06	0.11**	0.03	0.05	-0.17***	-0.00	0.01	-0.02	0.09*	NA	0.86***	**1.00**

Note: This table reports Pearson correlations below the diagonal and Spearman rank correlations above the diagonal, serving as a multicollinearity diagnostic prior to the regression analysis. *, ** and *** indicate significance at the 10%, 5%, and 1% levels

Table B7. Panel Association: Variable Lease Incidence

HasVarLease	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Full Model	+ SIC FE
Ln_Size t-1	0.328***								0.299***	0.318***
	(0.090)								(0.101)	(0.106)
Lease_Intensity t-1		1.98							1.98	2.05
		(1.77)							(2.06)	(2.17)
Sales_Vol t-1			0.402						0.969	1.22**
			(0.475)						(0.593)	(0.583)
Ln_Leverage t-1				0.297***					0.138	0.174
				(0.101)					(0.133)	(0.141)
Cash t-1					-5.59***				-4.59**	-4.04**
					(1.81)				(1.88)	(1.91)
ROA t-1						-0.241			2.39	1.78
						(1.29)			(2.05)	(2.02)
Loss t-1							-0.295		-0.312	-0.347
							(0.262)		(0.345)	(0.354)
Div t-1								-2.67	-2.64	-2.39
								(3.63)	(4.17)	(4.21)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIC FE	No	No	No	No	No	No	No	No	No	Yes
Observations	1,176	1,176	1,176	1,176	1,176	1,176	1,176	1,176	1,176	1,176

Note: This table reports logistic regression results estimating the association between firm characteristics and the probability of reporting variable lease expenses in a given year. Each predictor is entered individually before a combined full model with and without SIC fixed effects. Clustered standard errors at the firm level are in parentheses. *, ** and *** indicate significance at the 10%, 5%, and 1% levels.

Table B8. Panel Association: Variable Lease Intensity

Ln_VarLease_Intensity	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Full Model	+ SIC FE
Ln_Size t-1	0.019								0.004	-0.045
	(0.097)								(0.104)	(0.113)
Lease_Intensity t-1		-1.16							0.530	3.40
		(2.72)							(2.91)	(2.85)
Sales_Vol t-1			0.946*						0.700	1.11**
			(0.478)						(0.460)	(0.503)
Ln_Leverage t-1				-0.114					-0.316	-0.202
				(0.180)					(0.216)	(0.196)
Cash t-1					2.40				1.90	3.29
					(2.17)				(2.46)	(2.56)
ROA t-1						-2.81			-4.71	-5.29*
						(2.59)			(3.17)	(2.89)
Loss t-1							0.528		0.170	0.064
							(0.371)		(0.428)	(0.357)
Div t-1								-5.70	-1.34	-4.98
								(7.23)	(7.37)	(6.77)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIC FE	No	No	No	No	No	No	No	No	No	Yes
Observations	365	365	365	365	365	365	365	365	365	365
Adj. R2	0.003	0.006	0.020	0.007	0.015	0.012	0.013	0.008	0.036	0.164

Note: This table reports OLS regression results estimating the association between firm characteristics and the intensity of variable lease adoption measured as the logged ratio of variable-to capitalised-lease expense. Each predictor is entered individually before a combined full model with and without SIC fixed effects. Clustered standard errors at the firm level are in parentheses. *, ** and *** indicate significance at the 10%, 5%, and 1% levels.

9.3. Appendix C: Determinants of Variable Lease Adoption

Table C1. Variable Lease Incidence: Leverage (*Ln_Debt_Assets*) Interaction

HasVarLease	Main effects	Interaction	Controls	SIC FE
Lease_Intensity^c t-1	0.220	1.74	7.21**	8.36**
	(1.80)	(3.20)	(3.24)	(3.68)
Ln_Debt_Assets^c t-1	0.505***	0.470***	0.120	0.122
	(0.162)	(0.178)	(0.212)	(0.222)
Lease_Intensity^c t-1 x Ln_Debt_Assets^c t-1		-1.56	-5.25*	-5.71*
		(2.84)	(2.73)	(2.93)
Firm Controls	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
SIC FE	No	No	No	Yes
Observations	1,190	1,190	1,190	1,190

Note: This table reports logistic regression results estimating whether the interaction between on-balance lease intensity and leverage predicts variable lease adoption using logged debt-to-assets as the leverage variable. Clustered standard errors at the firm level are in parentheses. *, ** and *** indicate significance at the 10%, 5%, and 1% levels.

Table C2. Variable Lease Intensity: Leverage (*Ln_Debt_Assets*) Interaction

Ln_VarLease_Intensity	Main effects	Interaction	Controls	SIC FE
Lease_Intensity^c t-1	-0.408	-8.78*	-8.69	-3.71
	(2.94)	(4.99)	(5.32)	(6.40)
Ln_Debt_Assets^c t-1	-0.278	-0.104	-0.141	-0.124
	(0.283)	(0.282)	(0.319)	(0.312)
Lease_Intensity^c t-1 x Ln_Debt_Assets^c t-1		8.46*	8.17	5.52
		(4.60)	(4.92)	(5.49)
Firm Controls	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
SIC FE	No	No	No	Yes
Observations	373	373	373	373
Adj. R2	0.014	0.042	0.041	0.135

Note: This table reports OLS regression results estimating whether the interaction between on-balance lease intensity and leverage predicts the intensity of variable lease adoption, measured as the logged ratio of variable-to-capitalised lease expense, among firms reporting variable lease expenses, using logged debt-to-assets as the leverage variable. Clustered standard errors at the firm level are in parentheses. *, ** and *** indicate significance at the 10%, 5%, and 1% levels.

Table C3. Persistence of Heavy-Adopter Status

	Count (n)		Rate (%)	
	N non-heavy in t	N heavy in t	% non-heavy in t	% heavy in t
Panel A. Pooled one-year transitions by prior-year status				
Non-heavy-adopter t-1	257	11	95.9	4.1
Heavy-adopter t-1	13	81	13.8	86.2
Panel B. Year-specific one-year persistence among heavy-adopters in t-1				
2020	2	17	10.5	89.5
2021	4	14	22.2	77.8
2022	4	15	21.1	78.9
2023	3	16	15.8	84.2
2024	0	19	0.0	100.0

Note: This table reports the transition matrix and persistence of heavy-adopter status over time. Panel A shows pooled one-year transition rates and Panel B year-specific retention rates, both based on prior-year status. Rates are row percentages. Heavy-adopter status is defined within each year as the top quartile of the variable-to-capitalised expense ratio.

Table C4. Heavy Adoption Probability: Leverage (*Ln_Debt_Assets*) Interaction

Heavy_Year	Main effects	Interaction	Controls	SIC FE
Lease_Intensity^c t-1	0.385	-11.3	-13.6	-5.72
	(4.83)	(8.50)	(9.17)	(11.2)
Ln_Debt_Assets^c t-1	-0.144	0.129	0.280	0.272
	(0.420)	(0.500)	(0.467)	(0.563)
Lease_Intensity^c t-1 x Ln_Debt_Assets^c t-1		11.1	13.5*	9.80
		(7.15)	(7.72)	(9.28)
Firm Controls	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
SIC FE	No	No	No	Yes
Observations	373	373	373	368

Note: This table reports logistic regression results estimating whether the interaction between on-balance lease intensity and leverage predicts the probability of being a heavy-adopter of variable leases using logged debt-to-assets as the leverage variable. Clustered standard errors at the firm level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

9.4. Appendix D: Measurement Reliability and Recognition

Table D1. Persistence Across Lease Expense Categories (Non-Winsorised Variables)

	(1)	(2)	(3)	(4)	(5)	(6)
Ln_VarLease t-1	0.933***			0.902***		
	(0.022)			(0.028)		
Ln_STLVLease t-1		0.971***			0.943***	
		(0.011)			(0.022)	
Ln_CapLease t-1			0.977***			0.955***
			(0.004)			(0.009)
Firm Controls	No	No	No	Yes	Yes	Yes
Firm FE	No	No	No	No	No	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	362	837	1,195	362	837	1,195
Adj. R2	0.901	0.923	0.987	0.902	0.924	0.987

Note: This table reports OLS regression results estimating the persistence of non-winsorized variable, ST+LV, and capitalised lease expenses by regressing the log of each lease category on its one-year lag. Columns 1-3 exclude firm-level controls; columns 4-6 include them. Clustered standard errors at the firm level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

Table D2. 2-Year Persistence Across Lease Expense Categories

	(1) Ln_ VarLease	(2) Ln_ STLVLease	(3) Ln_ CapLease	(4) Ln_ VarLease	(5) Ln_ STLVLease	(6) Ln_ CapLease
Ln_VarLease t-2	0.894***			0.845***		
	(0.034)			(0.042)		
Ln_STLVLease t-2		0.948***			0.893***	
		(0.022)			(0.050)	
Ln_CapLease t-2			0.961***			0.918***
			(0.008)			(0.017)
Firm Controls	No	No	No	Yes	Yes	Yes
Firm FE	No	No	No	No	No	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	284	653	944	284	653	944
Adj. R2	0.845	0.853	0.972	0.847	0.855	0.973

Note: This table reports OLS regression results estimating the persistence of variable, ST+LV, and capitalised lease expenses by regressing the log of each lease category on its two-year lag. Columns 1-3 exclude firm-level controls; columns 4-6 include them. Clustered standard errors at the firm level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

Table D3. 2-Year Predictability Across Lease Expense Categories

	(1) VarLease – STLVLease	(2) VarLease – CapLease	(3) STLVLease – CapLease
MSE Diff	-0.043	0.159**	0.102***
	(0.096)	(0.071)	(0.035)
Observations	315	335	726
RMSE	-0.043	0.223	0.185

Note: This table reports pairwise comparisons of mean squared errors from a naïve two-year random-walk benchmark across variable, ST+LV and capitalised lease expenses. RMSE differences are reported as a supplementary measure of economic magnitude. Clustered standard errors at the firm level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

Table D4. Responsiveness to Lagged Revenue Across Lease Expense Categories

	(1) Ln_ VarLease	(2) Ln_ STLVLease	(3) Ln_ CapLease	(4) Ln_ VarLease	(5) Ln_ STLVLease	(6) Ln_ CapLease
Ln_Revenue t-1	0.446**	0.066	0.271***	0.314	0.061	0.166***
	(0.181)	(0.160)	(0.073)	(0.276)	(0.157)	(0.058)
Firm Controls	No	No	No	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	443	1,024	1,445	443	1,024	1,445
Adj. R2	0.918	0.923	0.985	0.920	0.923	0.987

Note: This table reports OLS regression results estimating the lagged revenue elasticity of variable, ST+LV, and capitalised lease expenses. The dependent variable is the log of each lease category. Columns 1-3 exclude firm-level controls and columns 4-6 include them. Clustered standard errors at the firm level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

Table D5. Responsiveness to Large Drops in Revenue Across Expense Categories

	(1) Ln_Var Lease	(2) Ln_STLV Lease	(3) Ln_Cap Lease	(4) Ln_Var Lease	(5) Ln_STLV Lease	(6) Ln_Cap Lease
Large_Decline (Sample)	0.122	-0.003	-0.010			
	(0.160)	(0.095)	(0.028)			
Large_Decline (By Year)				-0.040	-0.038	-0.006
				(0.138)	(0.084)	(0.027)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	443	1,025	1,446	443	1,025	1,446
Adj. R2	0.919	0.923	0.986	0.919	0.923	0.986

Note: This table reports OLS regression results estimating the response of variable, ST+LV and capitalised lease expenses to large revenue drops. Columns 1-3 use a sample-wide large revenue drop indicator and columns 4-6 a year specific indicator. Clustered standard errors at the firm level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

Table D6. Responsiveness to Large Increases in Revenue Across Expense Categories

	(1) Ln_ VarLease	(2) Ln_ STLVLease	(3) Ln_ CapLease	(4) Ln_ VarLease	(5) Ln_ STLVLease	(6) Ln_ CapLease
Large_Increase (Sample)	-0.221	0.082	-0.046			
	(0.164)	(0.101)	(0.034)			
Large_Increase (By Year)				-0.063	0.176	-0.063*
				(0.204)	(0.111)	(0.034)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	443	1,025	1,446	443	1,025	1,446
Adj. R2	0.920	0.923	0.986	0.919	0.923	0.986

Note: This table reports OLS regression results estimating the response of variable, ST+LV and capitalised lease expenses to large revenue increases. Columns 1-3 use a sample-wide large revenue increase indicator and columns 4-6 a year specific indicator. Clustered standard errors at the firm level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

Table D7. Persistence and Revenue Responsiveness of Variable Lease Intensity

VarLease_Intensity	(1)	(2)	(3)	(4)
VarLease_Intensity t-1	0.978***			
	(0.050)			
Ln_Revenue t		0.066		
		(0.040)		
Large_Drop (Sample)			-0.021	
			(0.058)	
Large_Drop (By Year)				-0.048
				(0.032)
Firm Controls	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	421	507	507	507
Adj. R2	0.762	0.744	0.744	0.745

Note: This table reports OLS regression results examining the stability of the ratio of variable-to-capitalised lease expense. Column (1) estimates persistence by regressing the ratio on its one-year lag. Column (2) estimates revenue sensitivity using the natural log of revenue as the independent variable. Columns (3) and (4) estimate the response of the ratio to large revenue drops, using a sample-wide and a year-specific indicator respectively. Clustered standard errors at the firm level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level.

9.5. Appendix E: Usage of AI

Generative AI has been used with due care throughout the development of this thesis. Two tools have been employed, ChatGPT and Claude, contributing in two primary ways.

Firstly, the most important area of AI use was coding assistance and troubleshooting. Although we both have a good understanding of R, both tools were valuable in writing parts of the code, identifying potential coding errors, and troubleshooting when the script did not run. The analytical choices, model specification, and interpretation of outputs remain our own, grounded in previous literature. We acknowledge the risk that AI can produce inaccurate code. Hence, we always discussed the code with both AI's back-in-forth to ensure that it had understood our prompt correctly. Furthermore, we only used parts that we understood completely, such that we were able to edit the code and verify it ourselves.

Secondly, generative AI has provided proofreading support. Identification and reading of prior literature, development of ideas, interpretation of empirical findings, and writing has been conducted by us. However, as we had finalised the writing, AI was used to suggest improvements to grammar, sentence structures, spelling, and language, with the aim of communicating our ideas as clear as possible. This has been done by pasting in specific sections of the text and asking prompts such as: "Are there any grammar or spelling mistakes in this section?". Relatedly, ChatGPT helped us format some of the APA references in the reference list.

We recognise that the overuse of AI tools carries inherent risks. To mitigate this, we avoided relying on AI for idea generation and limited its use to coding and language related support. Although we initially explored whether AI could streamline the data collection process, we found that it generally generated inaccurate figures. Hence, we conducted all data collection ourselves. Overall, these tools helped improve the efficiency of parts of the research process such that we could devote more time to substantive tasks, like analysing results, rather than mechanical ones like debugging code.