Does Lender Monitoring Spill Over into Supply Chain Contracts?

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Abstract

This paper examines the spillover effects of a common lender's monitoring on material contracts within supply chains. Enforcing contractual provisions can be costly and may constrain operational flexibility for industrial firms that lack specialization in comprehensive monitoring. However, a common lender—possessing extensive information about both suppliers and customers—can mitigate these constraints by influencing supply chain management practices. Using data on supply contracts disclosed in firms' public regulatory filings, I find that supply chain partners sharing a common lender are less likely to include governance covenants in their contracts. This effect is particularly pronounced when paired suppliers and customers face severe hold-up risks and struggle with credible communication. Unlike agency conflicts between lenders and bondholders, the spillover effect still remains when a supplier's financial risk is high. Additionally, suppliers are more inclined to offer favorable trade credit terms in agreements involving a common lender. These findings suggest that common lenders play a crucial role in supply chain relationships by reducing contracting frictions and facilitating more efficient arrangements through their monitoring advantages. This study contributes to our understanding of monitoring spillovers in financial intermediation and highlights how lenders' monitoring advantages can enhance supply chain efficiency beyond traditional financing roles.

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1. Introduction

Firms in contractual relationships (e.g., borrowers and lenders, customers and suppliers) monitor each other to achieve their business objectives. When these relationships overlap, the monitoring does too. Since the ability to enforce contract covenants varies, one party might benefit from another's efforts. For instance, HSBC (2023) lends to both Walmart and its suppliers, and Walmart leverages HSBC's monitoring to oversee those suppliers' carbon emissions. This raises an important question: Does lender monitoring spill over into supply chain contracts, and if so, under what conditions does such spillover enhance contracting efficiency?

Given that lenders are recognized as monitoring specialists (Fama, 1985; Berlin and Loeys, 1988), this paper investigates whether the monitoring by common lenders impacts contractual arrangements between borrowers. The finance literature acknowledges spillover effects in credit and bond markets (the monitoring spillover hypothesis), suggesting that these effects can reduce monitoring redundancy and enhance contractual flexibility (e.g. Booth, 1992; Ma et al., 2019; Houston et al., 2014; Beatty et al., 2012). However, the materialization of these spillovers is not automatic, as potential conflicts may emerge between supply chain partners and the common lender. Specifically, lender monitoring may prioritize institutional interests at the expense of other stakeholders (Jensen and Meckling, 1976; Bulow and Shoven, 1978; Ayotte and Bolton, 2011), whereas supply chain partners' monitoring tends to be relationship-specific. These divergent priorities suggest that monitoring spillovers may not effectively spill into supply chain contract design.

While common lenders may compromise the interests of junior lenders or bondholders

without jeopardizing their own recovery prospects, the failure of key supply chain partners—particularly those disclosed in SEC filings[1]—can materially impact the financial obligations of both suppliers and customers to lenders (Lee et al., 2015). Consequently, common lenders must incorporate significant supply chain participants' interests into their monitoring framework.

The above distinction motivates an investigation into the differential impacts of monitoring spillovers on supply contracts. First, I examine whether supply contracts exhibit fewer relation-specific governance provisions when suppliers and customers share a common lead lender at contract formation, hypothesizing that monitoring spillovers facilitate more flexible agreements. Second, I investigate whether such spillover effects are amplified when suppliers and customers face elevated opportunism or hold-up risks.[2] Third, building on evidence that firms employ alternative channels such as public disclosures to enhance credibility when direct communication is constrained (Ferreira and Rezende, 2007; Bourveau et al., 2024), I examine whether the monitoring spillover effects are amplified when supply chain partners face communication barriers. In such cases, common lenders may serve as trusted information intermediaries, given their established reputation as credible monitors.

To empirically test these predictions, I construct a comprehensive dataset of material supply contracts extracted from firms' SEC filings (10-K, 10-Q, 8-K, and S-Forms) following established methodologies in the literature (Costello, 2013; Bushee et al., 2020; Hui et al., 2024). The sample comprises 1,157 supply contracts spanning from 2003 to 2022, for which I

[1]Regulation S-K of the Securities Act of 1933 requires publicly filing companies to include all material contracts as exhibits in SEC filings

[2]For example, opportunism refers to a supplier potentially lowering product quality once the supply contract is established, while hold-up problems occur when a buyer invests in adjusting its products to better utilize the supplier's offerings, after which the supplier may raise prices.

successfully identify both supplier and customer entities and extract various types of supply chain covenants. To examine relation-specific governance provisions in supply chain management, I focus on two primary types of covenants: sales auditing covenants and product quality covenants.[3] These covenant categories capture two fundamental aspects of supply chain relationships: financial information accuracy and product quality assurance. I exploit the variation in these contractual provisions to identify the spillover effects of common lender monitoring.

Given the predominantly financial nature of lender-borrower relationships, I first examine the spillover effect of lender monitoring on suppliers' sales auditing covenants. Employing OLS regression analysis, I document that material supply contracts between customers and suppliers sharing a common lender in the five years preceding contract formation are significantly less likely to include sales auditing covenants. This evidence suggests that lender monitoring serves as a substitute for explicit contractual requirements regarding sales auditing, consistent with lenders' oversight providing sufficient assurance of suppliers' financial practices. These findings extend the arguments of Bushman and Wittenberg-Moerman (2012), demonstrating that the benefits of lender monitoring persist beyond the immediate lending relationship.

The monitoring spillover effects extend to product quality covenants as well. Lenders possess privileged access to borrowers' non-financial information, including detailed product market intelligence (De Franco et al., 2021; Chy et al., 2023)—information that is typically

[3]Sales auditing covenants address potential opportunistic behavior where suppliers might manipulate price information following buyer-specific investments. Product quality covenants mitigate the risk of suppliers compromising product quality after contract formation. Following Costello (2013), product quality covenants include requirements for ISO certification, FDA Current Good Manufacturing Practices (CGMP), and quality assurance provisions. For detailed examples, please see Appendix A.

costly or impossible for other market participants to obtain (Barney, 1986; Nelson and Winter, 1982). Moreover, lenders have strong incentives to monitor supplier product quality in specific supply relationships, as the stability of these relationships directly affects their loan repayment prospects. Consequently, common lender monitoring may reduce the need for explicit product quality provisions in supply contracts. Empirical analysis confirms this prediction, revealing a significant negative association between common lender presence and the inclusion of product quality covenants. The reduced presence of both sales auditing and product quality covenants in contracts involving common lenders provides strong support for my first prediction that lender monitoring spills over into supply contract design, resulting in more flexible contractual arrangements.

To provide more granular evidence of the monitoring spillover effect, I examine the intensive margin of product quality provisions in supply contracts. The analysis reveals that the presence of a common lender is associated with not only a lower likelihood of including product quality covenants, but also a reduction in the number of such provisions when they are included. These findings further support the monitoring spillover hypothesis by suggesting that when product quality certification entails substantial costs (Chen et al., 2021)—such as obtaining ISO certification or implementing routine inspection protocols—supply chain partners can leverage the common lender's monitoring infrastructure as a substitute for explicit contractual safeguards. This substitution effect not only reduces contracting frictions but also allows both parties to reallocate resources toward core operational activities, potentially enhancing supply chain efficiency.

While common lender monitoring reduces the use of contractual provisions through spillover effects, the economic significance of this substitution effect likely varies with the

severity of hold-up problems faced by supply chain partners. To test my second prediction regarding the interaction between monitoring spillovers and hold-up risks, I conduct cross-sectional analyses examining how the spillover effect varies with proxies for contracting frictions. Specifically, I examine three dimensions of hold-up risk: (1) geographic proximity between supplier and customer headquarters, which affects the cost and feasibility of direct monitoring through on-site inspections (Costello, 2013); (2) supplier financial constraints, measured by operating cash flow levels, as limited financial flexibility can exacerbate hold-up concerns (Tsai, 2008); and (3) relationship specificity, captured by the average duration of supplier partnerships, since supply relationships with greater asset specificity tend to require longer-term commitments (Joskow, 1987). Consistent with my second prediction, the results reveal that monitoring spillover effects are significantly stronger when supply chain partners face more severe hold-up risks, suggesting that common lender monitoring provides particularly valuable contracting benefits in settings where direct monitoring is costly or inefficient.

My third prediction posits that the benefits of common lender monitoring are greater when supply chain partners face credible communication challenges. To test this prediction, I conduct a series of cross-sectional analyses. I employ three proxies for communication frictions: the supplier's accounting quality (Armstrong et al., 2010; Minnis and Sutherland, 2017), the nature of the material supply agreement,[4] and the supplier's firm age (Bourveau et al., 2024). Consistent with my third prediction, the results indicate that monitoring spillover effects are significantly stronger when suppliers and customers face greater chal-

[4]Whether the contract is newly originated or an amendment can affect the level of scrutiny and negotiation required, with new contracts typically demanding more extensive due diligence and communication

lenges in establishing credible communication. Specifically, the reduction in contractual provisions associated with common lender presence is more pronounced when suppliers have poor accounting quality, when contracts are newly originated (rather than amendments), and when suppliers are younger firms. These findings suggest that common lenders enhance trust between supply chain partners by reducing the need for strict control provisions, which is particularly valuable when traditional communication channels are impaired. This aligns with Malhotra and Lumineau (2011)'s findings that excessive control provisions can impair goodwill-based trust between partners, while coordination-focused arrangements can enhance competence-based trust and foster continued collaboration. The evidence supports the hypothesis that common lender monitoring allows supply chain partners to rely less on rigid control provisions while maintaining effective coordination, thereby facilitating more sustainable business relationships in challenging communication environments.

In additional tests, I examine whether supply contracts offer more lenient trade credit policies when a common lender is involved. Suppliers often hesitate to extend favorable credit terms due to concerns about a customer's ability to meet financial obligations, which can disrupt transactions and the overall supply chain (Smith, 1987; Costello, 2020). The unique position of a common lender in monitoring liquidity conditions effectively reduces the risk exposure faced by suppliers and encourages the provision of more generous credit terms. As highlighted by Mester et al. (2001), bank loan officers possess detailed insights into a borrower's activities through their management of operating accounts. Lenders play a critical role in supporting interconnected firms (De Franco et al., 2021), thereby strengthening collaborative ties and fostering trust. This trust is crucial in preserving supplier-customer relationships (Ersahin et al., 2024), which aligns with the interests of the common lender.

Consequently, I posit that suppliers are more inclined to extend longer credit terms to customers when both parties share a common lender. The empirical results demonstrate that suppliers tend to offer more favorable trade credit policies in contracts involving a common lender compared to those without. These findings suggest that a common lender not only mitigates risk but also enhances the credibility of billing practices, thereby effectively addressing liquidity concerns within the supply chain.

To further establish the robustness of the monitoring spillover effect, I examine how agency conflicts between lenders and supply chain partners might influence the effectiveness of common lender monitoring. Prior literature suggests that agency conflicts between lenders and other stakeholders could potentially impair monitoring effectiveness, particularly when borrowers face financial distress (Ma et al., 2019; Houston et al., 2014; Li et al., 2018). However, I find that the reduction in contractual provisions associated with common lender presence persists even for firms with high financial risk. Unlike the U-shaped relationship between credit covenant strictness and borrower financial risk documented in bondholder-lender conflicts (Li et al., 2018), the relationship between common lender monitoring and supply contract design remains stable across different levels of financial risk. This evidence suggests that the monitoring spillover effects in supply chain relationships are robust to potential agency conflicts.

This paper makes significant contributions to three key areas of the literature. First, it uses the context of supply contracts to enhance the understanding of cross-monitoring benefits in situations where agency conflicts can be internalized. Research by Cohen et al. (2022) indicates that government contracting can reduce lender monitoring costs by lowering the need for loan covenants. Similarly, Houston et al. (2014) and Ma et al. (2019) demonstrate

how lender monitoring can alleviate the burden on bondholders. However, agency conflicts may arise between monitoring lenders and other debt holders, as lenders might prioritize their own interests, potentially at the expense of others (Li et al., 2018). The spillover effect of a common lender in supply contracts remains unclear. My findings indicate that monitoring by a common lender leads to more flexible supply contracts, as supply partners trust that the lender will ensure close monitoring to protect all parties' interests. This paper documents that supplier partners and bondholders exhibit different levels of agency conflicts with lenders, as supplier partners may have a more direct operational impact, potentially leading to immediate effects on the common lender (Lee et al., 2015). Moreover, it highlights that the benefits of lender monitoring can extend to the design of supply contracts, fostering more efficient and collaborative arrangements.

This paper contributes to the corporate governance literature by highlighting the role of a common lender in supply chain management. Existing studies show that while contractual mechanisms have improved information sharing among supply chain partners, cooperation in customer-supplier relationships remains limited due to disaggregated information and misaligned incentives (Baiman and Rajan, 2002). Issues such as overestimating product costs or overstating product quality can arise, complicating collaboration (Cachon and Lariviere, 2001; Özer and Raz, 2011; Bushee et al., 2020). My research provides novel empirical evidence that governance discipline from a common lender can positively influence supply chain management. Additionally, while previous studies have noted the lender's role as a matchmaker in reducing search costs and addressing information asymmetries (Frattaroli and Herpfer, 2023; Giacomini et al., 2024), it is unclear whether this role persists after the initial relationship formation. This paper demonstrates that the lender's involvement extends be-

yond matchmaking, offering ongoing support and oversight that enhances the stability and efficiency of supply chain relationships.

Finally, this paper contributes to the literature on trade credit. Research by Ersahin et al. (2024) finds that firms affected by natural disasters tend to both obtain and extend more trade credit to stabilize their supply chains. Additionally, trade credit is shown to facilitate trade and establish new supplier-customer relationships. For instance, Breza and Liberman (2017) demonstrate that restrictions on trade credit extensions reduce the likelihood of trade and lead firms to shift away from affected suppliers. Similarly, Beaumont and Lenoir (2023) find that suppliers impacted by a French reform limiting accounts receivable days experience an expansion in their customer base. My paper shows that when a common lender enhances credit confidence between suppliers and customers, suppliers are more willing to offer generous trade credit. This finding underscores the spillover effect of the common lender's involvement in fostering trade credit relationships, as the lender's monitoring and assurance create a more supportive environment for credit extensions.

2. Institutional Background and Literature Reviews

2.1. Common Lender in Supply Chain Management

A recent report from EY-Parthenon (Byrne and Noah, 2021) shows that leading lenders have begun to embrace long-term value creation as a pathway to sustainable growth and profitability. In their annual reports and mission statements (e.g., HSBC, Citi, JP Morgan Chase and Wells Fargo Bank), they all emphasize their commitment to building long-term business relationships with clients for future growth.

To achieve this long-term value strategy, prioritizing client interests and providing additional value-added services are critical. One effective approach lenders employ is leveraging their information and monitoring advantage over clients (borrowers) to encourage collaboration (Jones et al., 2022; Frattaroli and Herpfer, 2023). Becoming a common lender to both clients, the lender gains unique information and business advantage to both parties, and enhances the clients' dependence on itself. This practice has a longstanding presence in the industry, as evidenced by interviews with bankers in (Uzzi and Lancaster, 2003).[5] There is an increasing number of lenders are now explicitly offering these matchmaking services compared to the past. For instance, Citi Bank, HSBC, and China Construction Bank have introduced platforms to facilitate business collaborations among their clients, such as supply chain partnerships.[6] This evolution not only helps lenders expand their services beyond just providing credit but also fosters stronger long-term relationships with their clients.

Building on the role of lenders in facilitating business collaborations, this paper examines the monitor effort from a common lender spill over to supply relationships management, a topic that has not yet been explored. Specifically, I focus on the significance of a common lender who serves both suppliers and customers in a supply chain. First, as noted in Uzzi and Lancaster (2003), the relationship between borrowers and lenders takes time to build,

[5]One banker interviewed describes the process through which bankers form connections between borrowers: "You happen to find out that a firm is having problems sourcing a certain raw material, and the banker happens to know someone that provides that material. [. . .] the banker happens to know someone that they can trust that can help out. On and on, that's a network." Another banker states that "there are costs to the entrepreneur to gather [select] information. A relationship can set me apart if I deliver the information. That's the concept of value-added provider."

[6]HSBC provides a digital portal, the HSBC Connections Hub, allowing the bank's business customers to create profiles of their brands since 2017. This platform highlights potential buyers or sellers for customers (HSBC, 2017); China Construction Bank has offered matchmaking solutions since 2019 with "CCB Matchmaker Plus" for clients with cross-border needs (Yuan, 2024); Citi Group launched a pilot service in 2021 to digitally match U.S. small- and medium-sized businesses with local and regional banks (Henry, 2021)

as trust develops through ongoing lending interactions. This enables the lender to gain a deeper understanding of the borrowers and their preferences, making the common lender knowledgeable about both the supplier and the customer. Second, literature on pairing and matching indicates that high-quality firms are more inclined to trust lenders with which they have established connections (e.g., Roth and Sotomayor, 1992; Chemmanur and Fulghieri, 1994). Given these insights, the monitoring provided by a common lender can be particularly persuasive for both suppliers and customers, as both parties view the lender they cooperate with as a reputable monitor that represents the interests of both suppliers and customers.[7]

2.2. Costly Contracting

In the context of supply chain relationships, Coase (1937) asserts that an "arm's length" transactional approach can mitigate incentive distortions inherent in intra-firm operations. However, within the framework of transaction cost economics, such market-based relationships may create hold-up problems when parties make relationship-specific investments (Williamson, 1985; Krishnan et al., 2012). In these situations, profit-maximizing suppliers may have incentives to act opportunistically at their customers' expense (Freeman, 2023). To address these potential conflicts, agency theory suggests that supply chain partners should incorporate detailed provisions into their contracts (e.g. Jensen and Meckling, 1976; Maksimovic and Titman, 1991; Cachon and Lariviere, 2001; Costello, 2013; Chen and Lee, 2017; Shen et al., 2019). However, while contractual provisions can help govern complex relationships, their effectiveness is constrained by various factors including information incompleteness, monitoring costs, renegotiation friction, and macroeconomic uncertainty (Dyreng et al.,

[7]In my sample, almost all paired firms have at least one common lender from the top five lenders (J.P. Morgan Chase, Bank of America, Wells Fargo, Citigroup, U.S. Bank) in the U.S.

2023).

Smith and Warner (1979) posits that firms must balance the benefits of reducing agency costs of debt against the costs of decreased flexibility when including covenants in contracts. The complexity of a contract often correlates with a more detailed specification of promises, obligations, and processes for dispute resolution (Poppo and Zenger, 2002).[8] Given that the presence and intensity of covenants in contracts are typically associated with relatively distressed financial conditions of firms (Rajan and Winton, 1995; Bradley and Roberts, 2015), healthier firms may find that an overabundance of monitoring provisions can escalate costs (Carletti, 2004). The need for contractual safeguards increases only when exchange hazards rise (Williamson, 1985; Klein et al., 1978; Joskow, 1988; Macneil, 1977; Heide, 1994).

In supply chain management, customers must design governance arrangements that balance monitoring costs with the need to ensure appropriate quantity, price, and quality of supplier services (Coase, 1937; Williamson, 1985). However, implementing strict monitoring mechanisms through contractual provisions entails substantial costs (Chen et al., 2021). The experimental literature documents potential adverse effects of excessive monitoring, as it may signal distrust and trigger negative reciprocity (see Frey, 1993; Falk and Kosfeld, 2006; Belot and Schröder, 2016, for comprehensive reviews). Moreover, neither customers nor suppliers possess the specialized monitoring capabilities of financial institutions, and resources devoted to contract enforcement could be more efficiently allocated to value-enhancing projects (Beneish and Press, 1993; Chen and Wei, 1993; Tan, 2013). When alternative monitoring

[8]For instance, intricate contracts may outline detailed roles and responsibilities, establish procedures for monitoring compliance, specify penalties for noncompliance, and define expected outcomes or outputs to be delivered.

channels are available, reducing contractual monitoring provisions can enhance operational flexibility while lowering costs. Consistent with this view, Cachon and Zhang (2006) and Cohen et al. (2022) state that streamlined contracts generally improve efficiency for all parties, particularly when monitoring is already provided by other stakeholders such as lenders.

2.3. Lender Monitoring Advantages

The existing literature acknowledges that lenders engage in governance activities, such as monitoring and screening, to enhance information sharing and mitigate borrowers' opportunistic behaviors (moral hazard) (e.g. Leland and Pyle, 1977; Diamond, 1984; Fama, 1985; Boyd and Prescott, 1986; Diamond, 1991). While contractual mechanisms have improved information sharing among supply chain partners, reducing information asymmetries and mitigating incentive problems, the level of cooperation in customer-supplier relationships remains limited (Baiman and Rajan, 2002). Supply partners continue to face a monitoring disadvantage compared to lenders or analysts, who actively collect and process comprehensive business information through channels such as conference calls and private communications (Bushee et al., 2020; Green et al., 2014; Mayew et al., 2013). The information shared between suppliers and customers is typically disaggregated—tailored to each party—rather than presented at the firm level (Bushee et al., 2020). Furthermore, information sharing among supply partners is susceptible to misalignment of incentives, leading to potential issues such as overestimating product costs to induce customers to adjust their selling prices or overstating product quality to encourage customers to increase promotional capacity (Cachon and Lariviere, 2001; Özer and Raz, 2011).

In contrast to supply chain partners, lenders possess comparative monitoring advantages,

as they have access to a comprehensive array of private information that is unavailable to other stakeholders (Carrizosa and Ryan, 2017; Demerjian et al., 2020). The monitoring process employed by lenders not only analyzes publicly available information but also includes details such as new customer contracts, monthly pro forma financial statements, written communications from auditors, and advance notifications of adverse developments (Mester et al., 2001; Carrizosa and Ryan, 2017). This combination of advantages equips lenders with comprehensive insights into borrowers' business operations and financial conditions, positioning them favorably compared to the supply partners of borrowers (Smith and Warner, 1979; Roberts and Sufi, 2009).

Moreover, lenders conduct thorough due diligence prior to loan issuance and maintain ongoing oversight throughout the loan's duration, often extending beyond the loan period (Bushman and Wittenberg-Moerman, 2012). This ongoing relationship distinguishes lenders from other capital facilitators, such as underwriters, who manage the issuance of new public debt or equity but provide no monitoring after issuance. The governance benefits derived from lender monitoring potentially lasting for several years and spilling over to other stakeholders of borrowers (Houston and James, 1996).

3. Hypotheses Development

3.1. The Spillover Effect of the Common Lender's Monitoring

Lender monitoring generates benefits beyond the immediate lending relationship, creating significant spillover effects for various stakeholders of the borrowing firm (Booth, 1992; Beatty et al., 2012; Houston et al., 2014; Ma et al., 2019). The monitoring spillover hypothesis posits that firm stakeholders can benefit from monitoring and information collection conducted by

other stakeholders when the disciplinary effects and information produced by one claim holder are valuable to others. Prior literature documents these benefits in various settings. For example, Booth (1992) and Datta et al. (1999) find that the presence of an additional lender leads to reduced rates on newly issued debt, while Park (2000) show that junior lenders reduce their monitoring intensity when borrowers have existing debt with strong covenants. Similarly, Beatty et al. (2012) document reduced monitoring costs in multiple-lender relationships due to information spillovers across claimants.

The supply chain setting presents a unique opportunity to examine monitoring spillovers for several reasons. First, unlike the bond market where monitoring primarily focuses on financial aspects, supply chain relationships require monitoring of both financial and operational dimensions. Common lenders, through their ongoing relationships with both suppliers and customers, have access to detailed information about firms' operational performance, inventory management, and product market conditions (Uzzi and Lancaster, 2003; De Franco et al., 2021). Second, the interdependent nature of supply chain relationships means that the failure of one party can have substantial impacts on the entire chain, directly affecting lenders' loan security. This creates strong incentives for lenders to monitor both financial health and operational efficiency. Third, supply chain contracts often involve relationship-specific investments and complex performance metrics that are difficult for external parties to verify, making the common lender's comprehensive monitoring particularly valuable.

Since lenders are typically more effective monitors than other stakeholders in deterring risk-shifting activities, their monitoring benefits can extend to the borrower's upstream and downstream partners. A common lender's detailed information about both suppliers and customers may reduce these parties' incentives to engage in costly monitoring. This is par-

ticularly relevant as excessive contractual provisions can constrain value-enhancing corporate policies, ultimately reducing expected surplus gains. Therefore, I predict:

H1: *Supply contracts are less likely to include relation-specific governance covenants when the supplier and customer share a common lender at contract formation.*

3.2. Hold-up Risks and the Monitoring Spillovers

The effectiveness of monitoring spillovers likely varies with the severity of hold-up problems between supply chain partners. Hold-up problems arise when relationship-specific investments create bilateral dependencies between suppliers and customers (Williamson, 1985). These investments, while potentially value-enhancing, expose parties to opportunistic behavior and increase the need for contractual safeguards (Krishnan et al., 2012). Traditional solutions to hold-up problems often involve detailed contractual provisions that specify rights, obligations, and performance metrics (Jensen and Meckling, 1976). However, such provisions can be costly to design, implement, and enforce.

Common lender monitoring offers a potentially valuable alternative governance mechanism in the presence of severe hold-up risks. Lenders, through their ongoing relationships with both parties, can observe and verify relationship-specific investments, operational performance, and potential opportunistic behavior. This third-party monitoring can help mitigate hold-up concerns while maintaining operational flexibility (Cachon and Zhang, 2006; Cohen et al., 2022). When hold-up risks are more severe, the value of such monitoring likely increases, as supply chain partners face greater potential losses from opportunistic behavior and higher costs of contractual enforcement. Therefore, I predict:

H2: *The spillover effect of common lender monitoring on supply contracts is stronger when*

suppliers and customers face more severe hold-up risks.

3.3. Communication Frictions and Monitoring Spillovers

This section further explores the significance of having a common lender in situations where suppliers and customers struggle to communicate credibly with their current and potential partners (Ferreira and Rezende, 2007; Bourveau et al., 2024). Research indicates that when direct communication is difficult, these parties often rely on other credible channels, such as public disclosures, to facilitate interaction. Although supply chain partners can exchange information privately (e.g., about sales expectations, new product developments, etc.), this information is often disaggregated and tailored (Bourveau et al., 2024). In contrast, a common lender, who routinely reviews strategic and operational information from firms, receives more credible information than what is typically exchanged between suppliers.

The literature on relational governance suggests that trust and other relational norms can serve as substitutes for complex contractual provisions, potentially reducing monitoring costs (Mark, 1992; Bernheim and Whinston, 1998; Bradach and Eccles, 1989; Dyer and Singh, 1998; Adler, 2001). Unlike these self-enforcing relational mechanisms, common lender monitoring strengthens trust between supply chain partners through active, third-party verification. This trust-enhancing mechanism becomes particularly valuable when partners struggle to establish credible communication channels. Common lenders, by monitoring both parties, increase mutual confidence and facilitate reliable information exchange between partners who would otherwise find it difficult to verify each other's claims independently. Therefore, I predict:

H3: *The spillover effect of common lender monitoring on supply contracts is stronger when*

suppliers and customers face greater challenges in establishing credible communication.

4. Data and Sample Construction

4.1. Identification of Supply Contracts

Following established methodologies in the literature (Costello, 2013; Bushee et al., 2020; Hui et al., 2024), I construct a comprehensive dataset of material supply contracts from Securities and Exchange Commission (SEC) filings. Regulation S-K Section 10(ii)(b) mandates firms to file material business contracts as exhibits in their SEC filings, with each exhibit representing a distinct contract.

My data collection process involves three main steps. First, I employ Python-based algorithms to systematically parse and download metadata from EDGAR filings between 2003 and 2023 using sec-api.io, following Schroeder and Posch (2023). I focus on exhibits from Forms 10-K, 8-K, and S (Initial Public Offering) filings, retaining documents whose titles or first 1,000 characters contain relevant keywords such as "Supply" "Supplie*," "Manufactur*," "Procurement," "Service," "Construct*," "Buyer,"and "Seller."

Second, I implement several screening procedures to ensure data quality. I exclude contracts containing keywords indicative of non-supply agreements.[9] I then validate supply chain relationships by cross-referencing supplier and customer names with relationship records from FactSet and Compustat Segment data. From an initial set of 5,186 unique contract URLs, I exclude contracts shorter than 4,000 characters and consolidate amended contracts issued on the same day, yielding 4,410 contract records.

[9]Excluded keywords include "Memorandum," "Letter," "Warranty," "Terminate," "Dismiss," "Settle," "Discontinue," "Suspend," "Cessation," "Stock," "Equity," "Security," "Loan," "Credit," "Employ," "Mortgage," "Escrow," "Incentive," and "Asset transfer".

Finally, I determine contract dates using filing dates for Forms 10-K, 10-Q, and 8-K given their immediate disclosure requirements, while employing a language model to extract precise contract dates from S-form filings which may contain historical contracts. After excluding supply chain relationships involving firms in the financial, utility, and public administration sectors, and restricting the sample to firms in the Compustat universe and non-singleton observations, the final sample comprises 1,157 unique contracts from 2003 to 2023.

4.2. Measurement of Governance Covenants

Lenders possess monitoring abilities in two key areas that are critical to supply chain relationships. First, lenders excel in monitoring financial reporting accuracy. Supply chain partners face risks when their counterparties' financial status is opaque, as inaccurate information can lead to misaligned expectations and increased risk (Das and Teng, 1998; Dekker, 2004). For example, revenue and cost-sharing arrangements between partners often rely on reported financial metrics (Mayer and Teece, 2008), creating opportunities for manipulation of product cost accounts to reduce surplus sharing. Moreover, firms may misappropriate resources contributed by partners (Lerner and Malmendier, 2010; Demirkan and Zhou, 2016). Given that lender-borrower interactions primarily center on financial information, lenders' monitoring can enhance overall financial reporting quality, benefiting supply chain relationships.

Second, lenders also have the ability to monitor product quality, an area where customers often struggle to assess suppliers' offerings before engagement (Akerlof, 1970; Chen and Lee, 2017). Unlike other market participants, lenders have access to extensive non-financial information about their borrowers, including product market dynamics, detailed profitability

metrics, order backlogs, product development status, long-term technology trends, and managerial expertise (De Franco et al., 2021). This information is typically difficult for other parties to obtain, as it is deeply embedded in organizational culture (Barney, 1986) and routines (Nelson and Winter, 1982). Moreover, since disruptions in key supply relationships could jeopardize borrowers' financial stability, lenders have strong incentives to monitor these relationships closely.

Given these monitoring dimensions, I examine two primary categories of contractual provisions that reflect relation-specific governance: sales auditing and product quality covenants. Following prior literature (Costello, 2013; Hui et al., 2024), I employ a dictionary approach to systematically identify these provisions. For sales auditing covenants, I capture financial monitoring requirements by identifying sentences containing both monitoring-related terms ("audit*," "inspect*," or "verif*") and financial-related terms ("accounting," "records," "payment," "finan*," "price," "cost," "sale," or "revenu*"). This dual-keyword approach ensures the identification of meaningful sale auditing provisions.

For product quality covenants, following Costello (2013), I identify four types of standardized quality assurance requirements: (1) quality certifications, such as ISO standards or Current Good Manufacturing Practices (CGMP); (2) specific audit protocols for quality control; and (3) detailed product warranty provisions. These requirements constitute formal mechanisms for quality assurance throughout the supply relationship.

4.3. Identification of Common Lenders

To identify common lenders between supply chain partners, I implement a three-step matching procedure. First, I match both customers and suppliers from the supply contracts

with syndicated loan data from LPC DealScan, following Cohen et al. (2021). Second, I identify financial institutions serving as lead arrangers for credit facilities to both parties. A lender is classified as "common" if it maintains active loan facilities with both the customer and supplier within the five-year window preceding the supply contract formation date.

4.4. Sample Description

The final sample comprises 1,157 unique material supply contracts from 2003 to 2023. Table 1 presents the industry distribution of suppliers and customers. Manufacturing firms dominate the sample, representing 65.43% of suppliers and 62.40% of customers, followed by service firms (15.64% of suppliers and 11.84% of customers). Panel B shows that 54.71% of the contracts are supply and procurement agreements, while 47.28% are service contracts. Notably, 15.81% of contracts combine multiple types of agreements.

Table 2 provides descriptive statistics for key variables. About 9.2% of supply contracts in the sample involve a common lender. Regarding contractual provisions, 13.1% of contracts contain sales auditing covenants, while 40.4% include product quality covenants. The average trade credit term is 33.9 days, though this information is only available for 588 contracts. In terms of contract characteristics, 48.0% are amendments to existing agreements, and 25.6% involve suppliers and customers located in the same state, with an average geographic distance of 5.51 (log miles) between headquarters.

Suppliers in the sample have mean log total assets of 7.144, with a leverage ratio of 0.611 and ROA of -0.101. The average asset-scaled sales is 0.896, and the industry concentration measure (HHI) is 0.183. Customers in the sample have mean log total assets of 7.155, with a leverage ratio of 0.609 and ROA of -0.198. The average asset-scaled sales is 0.855, and

the industry concentration measure (HHI) is 0.185. Summary information for each of these variables is reported in Table 2.

5. Empirical Results

5.1. The Spillover Effect and the use of Contractual Covenants

To examine how common lender monitoring affects the use of governance covenants, I estimate the following OLS model at the supply contract level:

$$\begin{aligned}\Pr(\text{Clauses}_{l,t,s,c}=1) =&\alpha_l+\beta\text{Common Lender}_{l,t,t-5}\\ &+\mathbf{S}_{s,t}+\mathbf{C}_{c,t}+\Omega_l+\Lambda_t+\Theta_i+\Psi_d+\varepsilon_{i,t}\end{aligned} \tag{1}$$

The dependent variable, $Clauses_{l,t}$, is an indicator variable that takes two forms: *Sales Auditing Covenants* equals one if supply contract l between supplier s and customer c at year t contains sales auditing provisions, otherwise equals zero; *Product Quality Covenants* equals one if the contract includes product quality assurance covenants. The key independent variable, $Common\ Lender_{l,t,t-5}$, equals one if both the supplier and customer received financing from the same lead lender within the five years preceding contract formation.

Following Naidu and Ranjeeni (2024), I include comprehensive time-varying controls for both supplier and customer characteristics. Supplier controls ($\mathbf{S}_{s,t}$) include the natural logarithm of total assets ($Sup\ Ln(AT)$), leverage ratio ($Sup\ Leverage$), return on assets ($Sup\ ROA$), asset-scaled sales ($Sup\ Sale$), and industry concentration ($Sup\ HHI$). Customer controls ($\mathbf{C}_{c,t}$) mirror these supplier characteristics. To account for supply chain relationship characteristics, I control for the geographic distance between supplier and customer headquarters, as proximity affects monitoring costs (Costello, 2013), and include an indicator

for whether the contract is an amendment to an existing agreement to capture differences in established relationships. Detailed variable definitions are provided in the Appendix B.

The specification includes multiple effects to account for unobserved heterogeneity. Ω_l captures contract type fixed effects, as different contract purposes (e.g., sales, services) may influence the use of covenants. Λ_t absorbs year effects based on the supply contract's inception year to control for time trends affecting all sample firms. Θ_i represents supplier-customer paired industry fixed effects based on two-digit SIC codes, absorbing all time-invariant industry-level heterogeneity. Ψ_d accounts for supplier-customer paired state fixed effects. Given these multiple high-dimensional fixed effects, I employ OLS as the main estimation method. Standard errors are clustered at the supplier-customer pair level to account for within-pair correlation following Freeman (2023).

Table 3 reports the estimated associations between common lender presence and the use of contractual covenants. In Column (1), I find that the presence of a common lender is associated with a significant reduction in the likelihood of including sales auditing covenants. The coefficient of -0.090 is statistically significant at the 5% level. Given the unconditional mean of 13.1% for sales auditing covenants in my sample, this represents an economically significant decrease in the probability of having a sales auditing covenant by 20% over the unconditional mean likelihood. Similarly, Column (2) shows that the coefficient of common lender presence is -0.147 and statistically significant at the 5% level. Relative to the sample mean of 40.4%, this represents an 11% decrease over the unconditional mean likelihood. These results provide strong support for H1, suggesting that monitoring by common lenders spills over into supply contract design, thereby reducing the use of contractual governance provisions in supply chain relationships.

To provide more granular evidence of the monitoring spillover effect, I examine the intensive margin of product quality provisions in supply contracts. Specifically, I estimate the following model:

$$\begin{aligned} \text{ProdCovNum}_{\text{l,t,s,c}} = \alpha_l + \beta \text{Common Lender}_{l,t,t-5} \\ + \mathbf{S}_{s,t} + \mathbf{C}_{c,t} + \Omega_l + \Lambda_t + \Phi_f + \varepsilon_{i,t} \end{aligned} \tag{2}$$

The dependent variable, $ProdCovNum$, is a non-negative count variable ranging from 0 to 3, capturing three distinct types of product quality assurance covenants: ISO and CGMP certification requirements, product quality audit protocols, and warranty provisions. Given the count nature of the dependent variable and the prevalence of zero observations in the data, I employ multiple estimation approaches following past literature (e.g. Rock et al., 2000; Silva and Tenreyro, 2006, 2022). Specifically, I estimate the model using: (1) OLS as a baseline specification, (2) Zero-inflated Poisson (ZIP) regression to account for excess zeros, and (3) Poisson pseudo-maximum likelihood (PPML) to accommodate high-dimensional fixed effects.

The model includes the same control variables as in Table 4. For both OLS and PPML specifications, I include year fixed effects (Λ_t) and supplier-customer paired firm fixed effects (Φ_f). Standard errors are clustered at the supplier-customer pair level throughout all specifications.

Among these specifications, PPML emerges as the preferred estimation method for several reasons. First, while the data exhibits slight overdispersion (variance of 0.90 versus mean of 0.70), PPML remains consistent regardless of the variance-mean relationship (Silva and

Tenreyro, 2006, 2010). Second, PPML performs well with a high proportion of zero values and accommodates high-dimensional fixed effects, which pose convergence challenges for zero-inflated models (Silva and Tenreyro, 2010, 2011; Correia et al., 2020; Silva and Tenreyro, 2022). The results consistently show that common lender presence is associated with both a lower likelihood of including product quality covenants and a reduction in the number of such provisions when they are included.

5.2. Hold-up Risks and the Monitoring Spillovers

I conduct cross-sectional analyses to examine how monitoring spillover effects vary with hold-up risks. Following prior literature, I explore three sources of heterogeneity: (1) geographic proximity between supplier and customer headquarters, which affects direct monitoring costs (Costello, 2013); (2) supplier financial constraints, measured by operating cash flow levels (Tsai, 2008); and (3) relationship specificity, captured by the supplier's average partnership duration across all its customers (Joskow, 1987). For each source of hold-up risk, I estimate equation 1 separately for subsamples split at different severity levels.

Table 5 presents the results. Panel A splits the sample based on whether suppliers and customers are headquartered in the same state. Geographic distance increases hold-up risk because it makes direct monitoring and verification more costly and difficult, increasing information asymmetry between supply chain partners (Costello, 2013). The common lender effect on sales auditing covenants is significantly negative (-0.103, $p<0.05$) for different-state pairs but insignificant for same-state pairs, with the difference being statistically significant. This suggests that common lender monitoring is particularly valuable when geographic distance impedes direct monitoring. A similar but statistically weaker pattern emerges for

product quality covenants.

Panel B examines how supplier financial constraints influence the spillover effect of common lender monitoring by splitting the sample based on operating cash flow levels. Low operating cash flow indicates higher hold-up risk, as financially constrained suppliers have stronger incentives to manipulate sales and pricing information to improve their cash position (Tsai, 2008). The results show that the monitoring spillover effect of common lenders varies with suppliers' financial constraints. Specifically, the reduction in contractual provisions associated with common lender presence is more pronounced for suppliers with low cash flow. The coefficient magnitude for sales auditing covenants is -0.140 ($p < 0.10$) in the low-cash-flow subsample compared to -0.070 (insignificant) in the high-cash-flow subsample. For product quality covenants, though not statistically different from the high-cash-flow subsample, the effect is notably larger in the low-cash-flow subsample (-0.315) than in the high-cash-flow subsample (-0.062). These findings suggest that the monitoring spillover effect of common lenders becomes particularly important when suppliers face financial constraints, precisely when the risk of opportunistic behavior is highest.

Panel C explores relationship specificity through suppliers' average partnership duration. Longer average duration indicates greater relationship specificity and thus higher hold-up risk, as it reflects the supplier's specialized products or services (Joskow, 1987). The common lender effect is significant only for suppliers with above-mean partnership duration, both for sales auditing and product quality covenants. The effect difference is particularly significant for product quality covenants, consistent with relationship specificity being more relevant for product-related monitoring.

These findings support my second prediction that monitoring spillover effects are stronger

when supply chain partners face more severe hold-up risks, suggesting that common lender monitoring provides particularly valuable contracting benefits in these settings.

5.3. Communication Frictions and Monitoring Spillovers

Beyond hold-up risks, effective communication between supply chain partners plays a crucial role in contract design. To examine whether common lender monitoring becomes more valuable when supply chain partners face communication challenges, I explore three dimensions where information frictions typically arise: (1) supplier's accounting quality (Armstrong et al., 2010; Minnis and Sutherland, 2017); (2) contract origination status (new versus amended agreements); and (3) supplier's firm age (Bourveau et al., 2024). For each source of communication friction, I estimate equation 1 separately for subsamples split at different severity levels.

Table 6 presents the results. Panel A splits the sample based on supplier's accounting quality. Poor accounting quality increases communication frictions as it reduces the reliability and verifiability of financial information shared between partners (Armstrong et al., 2010; Chen et al., 2021). The common lender effect on sales auditing covenants is significantly negative for suppliers with low accounting quality but insignificant for those with high accounting quality, with the difference being statistically significant. While both subsamples show significant reductions in product quality covenants, the lack of differential effects between high and low accounting quality subsamples is consistent with accounting quality primarily capturing financial information accuracy rather than product-related information flows (Bushman and Smith, 2001). This interpretation aligns with the stronger differential effect observed for sales auditing covenants, which are more directly linked to financial

information verification.

Panel B examines the role of contract origination status. New contracts involve greater information uncertainty and verification needs compared to amendments of existing agreements (Bourveau et al., 2024). The common lender effect is stronger for newly originated contracts compared to amendments, both for sales auditing covenants and product quality covenants. The difference is particularly significant for product quality covenants, suggesting that common lender monitoring is especially valuable during initial contracting phases.

Panel C explores the role of supplier age. Younger firms typically face greater challenges in establishing credible communication due to limited track records and reputational capital (Bourveau et al., 2024). The common lender effect is significantly negative for young suppliers in both sales auditing and product quality covenants, but insignificant for older firms. The differences are statistically significant for sales auditing and for product quality covenants, consistent with common lender monitoring being more valuable when dealing with less established suppliers.

These findings support my third prediction that monitoring spillover effects are stronger when supply chain partners face greater communication frictions. The results suggest that common lenders serve as valuable information intermediaries, particularly when traditional communication channels are impaired by poor accounting quality, contractual novelty, or limited operational history.

6. Other Tests

6.1. Additional Test: Trade Credit Terms and Common Lender Monitoring

Beyond contractual governance provisions, I examine whether common lender monitoring affects trade credit terms in supply contracts. Trade credit represents an important financing arrangement in supply chain relationships, and its terms reflect the level of trust and information sharing between partners. To analyze this relationship, I estimate the following model:

$$\begin{aligned} \text{Trade Credit}_{\text{l,t,s,c}} = \alpha_l + \beta \text{Common Lender}_{l,t,t-5} \\ + \mathbf{S}_{s,t} + \mathbf{C}_{c,t} + \Omega_l + \Lambda_t + \Phi_f + \varepsilon_{i,t} \end{aligned} \tag{3}$$

where $Trade\ Credit_{l,t,s,c}$ represents the payment period in days specified in contract l between supplier s and customer c at year t. The model includes the same control variables as in the previous analyses, along with contract type effects, year and supplier-customer paired firm fixed effects (Ω_l, Λ_t, Φ_f). Standard errors are clustered at the supplier-customer pair level.

Table 7 presents the results. Column (1), which focuses on supply agreements, shows that the presence of a common lender is associated with an 18.3-day increase in the payment period ($p < 0.01$). Column (2) examines newly originated contracts and documents a similar, though slightly smaller, effect of 12.7 days ($p < 0.01$). While the effect in the full sample (Column 3) is positive but statistically insignificant, the stronger and significant effects observed in supply agreements suggest that common lender monitoring is particularly valuable in pure supply relationships where trade credit terms are more salient and critical to the business relationship.

The results support the broader monitoring spillover hypothesis by demonstrating that common lender monitoring facilitates not only more flexible governance provisions but also more favorable financing terms. This evidence suggests that suppliers view common lender monitoring as a valuable supplement to their own credit risk assessment, enabling them to extend more generous payment terms to their customers.

6.2. Robust Test: Agency Conflicts and Monitoring Spillovers

To examine whether the monitoring spillover effects remain robust when borrowers face financial distress, I conduct additional tests exploring the interaction between common lender monitoring and supplier financial risk. Prior literature on bond markets suggests that agency conflicts between lenders and other stakeholders could potentially impair monitoring effectiveness, particularly when borrowers face financial distress (Li et al., 2018). To test this alternative explanation, I estimate the following interaction model:

$$\begin{aligned} \text{pr}(\text{Clauses}_{\text{l,t,s,c}} = 1) = \alpha_l &+ \beta_1 \text{Common Lender}_{l,t,t-5} + \beta_2 \text{Financial Risk}_t \\ &+ \beta_3 \text{Common Lender}_{l,t,t-5} \times \text{Financial Risk}_t \\ &+ \mathbf{S}_{s,t} + \mathbf{C}_{c,t} + \Omega_l + \Lambda_t + \Phi_f + \varepsilon_{i,t} \end{aligned} \tag{4}$$

Table 8 examines whether the common lender monitoring effect varies with supplier financial risk using three distinct measures: (1) low Tobin's Q (below sample mean), (2) high leverage (above sample mean), and (3) high expected default frequency (above sample mean). The model includes interaction terms between *Common Lender* and each financial risk indicator (*Low Sup TobinQ Dum*, *High Sup Leverage Dum*, and *High Sup Exp. Default Freq*). Across all specifications, I find no evidence that supplier financial distress weakens the moni-

toring spillover effects. The interaction terms between common lender presence and financial risk measures remain statistically insignificant for both sales auditing and product quality covenants. Moreover, the main effect of common lender maintains its negative and significant coefficient, suggesting that the reduction in contractual provisions persists even when suppliers face financial difficulties. These findings contrast with traditional bondholder-lender conflicts where monitoring effectiveness typically deteriorates during financial distress.

These findings contrast with the U-shaped relationship between credit covenant strictness and borrower financial risk documented in bondholder-lender conflicts (Li et al., 2018). The persistent monitoring spillover effects suggest that common lenders maintain effective monitoring of supply chain relationships even when borrowers face financial distress, likely because supply chain stability directly affects their loan recovery prospects. This evidence further supports the monitoring spillover hypothesis rather than an agency conflict explanation.

7. Conclusion

This study documents the spillover effects of common lender monitoring in supply chain relationships. I find that the presence of a common lender significantly reduces the inclusion of both sales auditing and product quality covenants, suggesting that supply chain partners adopt more flexible contractual arrangements when sharing a common lender. This finding extends the monitoring spillover literature beyond traditional financial markets (Houston et al., 2014; Ma et al., 2019) to supply chain relationships.

The monitoring spillover effects vary systematically with contracting frictions. The reduction in contractual provisions is more pronounced when supply chain partners face severe

hold-up risks due to geographic distance or relationship specificity. Common lenders, serving as trusted monitors with access to both parties' information, create an environment where supply chain partners are more willing to adopt flexible arrangements. This effect is particularly valuable when communication frictions arise from poor accounting quality or limited operational history, extending beyond the traditional matchmaking role documented by Frattaroli and Herpfer (2023).

Moreover, these monitoring spillovers extend to financial arrangements, as suppliers offer more favorable trade credit terms when sharing a common lender with their customers. Notably, these effects persist even during financial distress, suggesting that common lenders maintain effective monitoring regardless of borrowers' financial conditions (Ersahin et al., 2024; Beaumont and Lenoir, 2023).

This study contributes to three streams of literature. First, it enhances our understanding of monitoring spillovers by documenting how lender monitoring benefits supply chain relationships (Cohen et al., 2022). Second, it demonstrates how lenders can enhance supply chain management by strengthening trust between partners, particularly when traditional verification mechanisms are costly. Finally, it shows how financial intermediation can foster more efficient supply chain arrangements through increased contractual flexibility and enhanced trade credit terms.

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Tables

Table 1. Sample Distributions

Panel A: Distribution of Firms by Industry

	Supplier		Buyer	
	Percent	Frequency	Percent	Frequency
Agriculture, Mining, Construction	5.28	61	5.96	69
Manufacturing	65.43	757	62.40	722
Transportation, Communications, and Sanitary Service	9.33	108	10.89	126
Wholesale and Retail Trade	4.32	50	8.90	103
Service	15.64	181	11.84	137
Total	100.00	1,157	100.00	1,157

Panel B: Supply Contract Type

	Percent	Frequency
Supply, Procurement Contract	54.71	633
Manufacturing, Construction Contract	13.83	160
Service Contract	47.28	547
Multi Type Contract	(-) 15.81	(-) 183
Total Contract	100.00	1,157

In Table 1, I present the sample distribution of supplier and customer industries, and contract types. Panel A reports the industry distribution of suppliers and customers based on SIC 2-digit codes. Panel B reports the distribution of contract types. Supply, Procurement, Manufacturing, Construction, and Service agreements can be combined within a single contract, thus the sum of individual contract types exceeds 100%. The negative value in Multi Type Contract represents the adjustment to account for contracts combining multiple types.

Table 2. Key Variables Descriptive Statistics

	N	μ	σ	25^{th}%ile	50^{th}%ile	75^{th}%ile
Key Variables						
Common Lender	1,157	0.092	0.290	0.000	0.000	0.000
Governance Covenants						
Sales Audit Covenants	1,157	0.131	0.337	0.000	0.000	0.000
Product Quality Covenants	1,157	0.404	0.491	0.000	0.000	1.000
ProdCovNum.	1,157	0.710	0.964	0.000	0.000	2.000
Trade Credit (Days)	588	33.913	18.706	30.000	30.000	30.000
Contract Characteristics						
Supply Agreement	1,157	0.547	0.498	0.000	1.000	1.000
Service Agreement	1,157	0.473	0.499	0.000	0.000	1.000
Construction Agreement	1,157	0.138	0.345	0.000	0.000	0.000
Amended	1,157	0.480	0.500	0.000	0.000	1.000
Distance	1,157	5.513	2.509	4.617	6.558	7.441
Same State	1,157	0.256	0.437	0.000	0.000	1.000
Supplier Characteristics						
Sup Ln(AT)	1,157	7.144	2.627	5.102	7.162	9.103
Sup Leverage	1,157	0.611	0.476	0.368	0.568	0.738
Sup ROA	1,157	-0.101	0.457	-0.085	0.029	0.078
Sup Sale	1,157	0.896	0.853	0.392	0.648	1.088
Sup HHI	1,157	0.183	0.145	0.073	0.149	0.216
Sup Acct. Quality.	1,080	0.025	0.379	-0.028	0.030	0.109
Sup Cash Vol.	1,105	0.066	0.085	0.018	0.038	0.081
Customer Characteristics						
Cus Ln(AT)	1,157	7.155	2.776	5.038	7.096	9.403
Cus Leverage	1,157	0.609	0.600	0.333	0.548	0.757
Cus ROA	1,157	-0.198	0.750	-0.219	0.017	0.076
Cus Sale	1,157	0.855	1.008	0.268	0.591	0.966
Cus HHI	1,157	0.185	0.142	0.074	0.148	0.216

In Table 2 , I present summary statistics for the variables used in the analysis. In column (1), we report the number of observations, in column (2) we report the mean, in column (3) we report the standard deviation, and in columns (4)-(6) we report the first, second, and third quartiles of the distribution. Definitions of the variables are in Appendix B.

Table 3. Governance Covenants and the Common Lender

Dept.Var =	Sales Auditing Covenants (1)	Product Quality Covenants (2)
Common Lender	-0.090**	-0.147**
	(-2.44)	(-2.57)
Distance	-0.004	0.009
	(-0.30)	(0.49)
Amended	-0.030	-0.188***
	(-1.22)	(-5.26)
Supplier Controls	Yes	Yes
Customer Controls	Yes	Yes
Contract Types	Yes	Yes
Year Effects	Yes	Yes
Sup-Cus Ind FEs	Yes	Yes
Sup-Cus State FEs	Yes	Yes
N	1,157	1,157
Adj. R^2	0.24	0.31

This table reports coefficient estimates from OLS regressions examining the relation between the use of a certain clause in a supply contract and the existence of a common lender. I examine the following linear probability model:

$$\text{pr}(\text{Clauses}_{\text{l,t,s,c}} = 1) = \alpha_l + \beta \text{Common Lender}_{l,t,t-5} + \mathbf{S}_{s,t} + \mathbf{C}_{c,t} + \Omega_l + \Lambda_t + \Theta_i + \Psi_d + \varepsilon_{i,t}$$

$\boldsymbol{Clauses}_{l,t}$ is an indicator variable equal to one if supply contract l between supplier s and customer c in year t requires the supplier to audit sales-related financial information (*Sales Auditing Covenants*) or provide product quality assurance (*Product Quality Covenants*), and zero otherwise. $Common\ Lender_{l,t,t-5}$ equals one if both supplier and customer received financing from the same lender within five years prior to contract formation. Each regression includes time-varying supplier controls ($\mathbf{S}_{s,t}$): log-transformed Supplier Asset ($Sup\ Ln(AT)$), Supplier Leverage (*Sup Leverage*), Supplier ROA (*Sup ROA*), Supplier asset-scaled sales (*Sup Sale*), and Supplier HHI ($Sup\ HHI$). Customer controls ($\mathbf{C}_{c,t}$) mirror these supplier variables. All control variables are defined in Appendix B. The regressions absorb contract type effects (Ω_l) and include year, supplier-customer paired industry, and supplier-customer paired state fixed effects (Λ_t, Θ_i, Ψ_d). Standard errors are clustered at supplier-customer pair level, t statistics are reported in parentheses. Statistical significance is indicated as follows: $*\ p < .1$, $**\ p < .05$, $***\ p < .01$.

Table 4. Product Quality Covenants Intensity and the Common Lender

Dept.Var = ProdCovNum	OLS (1)	ZIP (2)	PPML (3)
Common Lender	-0.307**	-0.344**	-0.413**
	(-2.44)	(-2.18)	(-2.33)
Amended	-0.311***	-0.233***	-0.403***
	(-4.52)	(-3.61)	(-4.91)
Distance	0.008	0.029**	-0.004
	(0.21)	(1.97)	(-0.08)
Supplier Controls	Yes	Yes	Yes
Customer Controls	Yes	Yes	Yes
Contract Types	Yes	Yes	Yes
Year Effects	Yes	No	Yes
Sup-Cus Ind FEs	Yes	No	Yes
Sup-Cus State FEs	Yes	No	Yes
N	1,157	1,157	847
Adj. R^2	0.31		
Log likelihood		-1214.9	-918.2
Pseudo R^2			0.18

This table reports estimates from OLS (Column 1), Zero-Inflated Poisson (ZIP in Column 2), and Poisson pseudo-maximum likelihood (PPML in Column 3) models examining how common lender presence affects the intensity of product quality assurance covenants in supply contracts. Specifically, I estimate the following model:

$$\begin{aligned}\text{ProdCovNum}_{\text{l,t,s,c}} = \alpha_l + \beta\text{Common Lender}_{l,t,t-5} \\ + \mathbf{S}_{s,t} + \mathbf{C}_{c,t} + \Omega_l + \Lambda_t + \Phi_f + \varepsilon_{i,t}\end{aligned}$$

The dependent variable, *ProdCovNum*, is a count variable ranging from 0 to 3, representing the sum of three types of product quality assurance provisions. Column 1 reports OLS coefficients, while Columns 2 and 3 report average marginal effects. The Vuong test statistic of 2.42 for the ZIP model (Column 2) indicates that it provides a better fit than the standard Poisson model, given the high proportion of zero observations.Standard errors are clustered at supplier-customer pair level, t statistics are reported in parentheses. Statistical significance is indicated as follows: $* \; p < .1$, $** \; p < .05$, $*** \; p < .01$.

Table 5. Cross-Sectional Variation of Common Lender Effects in Holdup Risks

Dept.Var =	Sales Auditing Covenants			Product Quality Covenants		
Panel A. Geographic Location						
	Same State	Diff State	Diff	Same State	Diff State	Diff
	(1)	(2)	(1)-(2)	(3)	(4)	(3)-(4)
Common Lender	0.027	-0.103**	***p<0.01***	-0.130	-0.112*	*p>0.10*
	(0.39)	(-2.32)		(-1.55)	(-1.88)	
Controls	Yes	Yes		Yes	Yes	
Contract Types	Yes	Yes		Yes	Yes	
Sup-Cus Ind FEs	Yes	Yes		Yes	Yes	
Year Effects	Yes	Yes		Yes	Yes	
N	296	861		296	861	
Adj. R^2	0.27	0.20		0.19	0.32	
Panel B. The Level of Supplier's Operation Cash Flow						
	High	Low	Diff	High	Low	Diff
	(1)	(2)	(1)-(2)	(3)	(4)	(3)-(4)
Common Lender	-0.070	-0.140*	***p<0.10***	-0.062	-0.315***	*p>0.10*
	(-1.62)	(-1.80)		(-0.88)	(-3.52)	
Controls	Yes	Yes		Yes	Yes	
Contract Types	Yes	Yes		Yes	Yes	
Sup-Cus Ind FEs	Yes	Yes		Yes	Yes	
Year Effects	Yes	Yes		Yes	Yes	
N	610	547		610	547	
Adj. R^2	0.14	0.22		0.24	0.30	
Panel C. Supplier Average Supply Chain Duration						
	Short Duration	Long Duration	Diff	Short Duration	Long Duration	Diff
	(1)	(2)	(1)-(2)	(3)	(4)	(3)-(4)
Common Lender	0.022	-0.090**	*p>0.10*	-0.138	-0.158***	***p<0.01***
	(0.23)	(-2.15)		(-1.45)	(-2.60)	
Controls	Yes	Yes		Yes	Yes	
Contract Types	Yes	Yes		Yes	Yes	
Sup-Cus Ind FEs	Yes	Yes		Yes	Yes	
Year Effects	Yes	Yes		Yes	Yes	
N	361	771		361	771	
Adj. R^2	0.14	0.23		0.32	0.29	

This table explores variation in common lender monitoring effects across different supply chain characteristics by estimating equation 1 for distinct subsamples. Panel A partitions the sample based on geographic proximity, comparing supply chain partners with headquarters in the same state versus different states. Panel B splits the sample based on supplier financial constraints, using operating cash flow relative to the sample median. Panel C examines the role of relationship specificity by comparing suppliers with average business durations above versus below 5 years. Standard errors are clustered at supplier-customer pair level, t statistics are reported in parentheses. Statistical significance is indicated as follows: $* \ p < .1$, $** \ p < .05$, $*** \ p < .01$.

Table 6. Cross-Sectional Variation of Common Lender Effects in Credible Communication With Supplier

Dept.Var =	Sales Auditing Covenants			Product Quality Covenants		
Panel A. Supplier Accounting Quality						
	Low	High	Diff	Low	High	Diff
	(1)	(2)	(1)-(2)	(3)	(4)	(3)-(4)
Common Lender	-0.110*	0.009	***p<0.10***	-0.170**	-0.215**	*p>0.10*
	(-1.95)	(0.14)		(-2.33)	(-2.39)	
Controls	Yes	Yes		Yes	Yes	
Contract Types	Yes	Yes		Yes	Yes	
Sup-Cus Ind FEs	Yes	Yes		Yes	Yes	
Year Effects	Yes	Yes		Yes	Yes	
N	540	540		540	540	
Adj. R^2	0.20	0.17		0.30	0.33	
Panel B. First Material Supply Contracts						
	First	Amended	Diff	First	Amended	Diff
	(1)	(2)	(1)-(2)	(3)	(4)	(3)-(4)
Common Lender	-0.103*	-0.053	***p<0.10***	-0.186**	-0.128*	***p<0.01***
	(-1.88)	(-1.14)		(-2.46)	(-1.70)	
Controls	Yes	Yes		Yes	Yes	
Contract Types	Yes	Yes		Yes	Yes	
Sup-Cus Ind FEs	Yes	Yes		Yes	Yes	
Year Effects	Yes	Yes		Yes	Yes	
N	602	555		602	555	
Adj. R^2	0.17	0.18		0.38	0.18	
Panel C. Supplier's Age						
	Low	High	Diff	Low	High	Diff
	(1)	(2)	(1)-(2)	(3)	(4)	(3)-(4)
Common Lender	-0.088**	0.074	***p<0.05***	-0.142**	-0.062	***p<0.10***
	(-2.27)	(1.08)		(-2.26)	(-0.66)	
Controls	Yes	Yes		Yes	Yes	
Contract Types	Yes	Yes		Yes	Yes	
Sup-Cus Ind FEs	Yes	Yes		Yes	Yes	
Year Effects	Yes	Yes		Yes	Yes	
N	716	315		716	315	
Adj. R^2	0.27	0.23		0.32	0.24	

This table examines how the effect of common lender monitoring varies with communication frictions by by estimating equation 1 for distinct subsamples. Panel A partitions the sample based on supplier accounting quality, using the sample median as the cutoff. Panel B distinguishes between newly originated contracts and contract amendments.Panel C examines supplier age, comparing firms above and below 10 years old. Standard errors are clustered at supplier-customer pair level, t statistics are reported in parentheses. Statistical significance is indicated as follows: $* \ p < .1$, $** \ p < .05$, $*** \ p < .01$.

Table 7. Common Lead Lender and Trade Credit (Days)

Dept.Var = Trade Credit (Days)	Supply (1)	Origination (2)	Whole Sample (3)
Common Lender	18.323***	12.726***	5.352
	(4.57)	(3.16)	(1.43)
Supplier Controls	Yes	Yes	Yes
Customer Controls	Yes	Yes	Yes
Contract Types	No	Yes	Yes
Sup-Cus Pair FEs	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes
N	312	344	588
Adj. R^2	0.83	0.55	0.58

This table reports coefficient estimates from OLS regressions examining the relation between the days of trade credit in a supply contract and the existence of a common lender. Column (1) is on supply agreement, Column (2) is on origination agreement, Column (3) is on the whole sample agreement. I examine the following linear probability model:

$$\text{Trade Credit}_{\text{l,t,s,c}} = \alpha_l + \beta \text{Common Lender}_{l,t,t-5} + \mathbf{S}_{s,t} + \mathbf{C}_{c,t} + \Omega_l + \Lambda_t + \Phi_f + \varepsilon_{i,t}$$

$Trade\ Credit_{l,t,s,c}$ is the trade credit days in the contract l between supplier s and customer c at year t. Control variables are same to the Table 3. I also include year, and supplier-customer paired firm fixed effects (Λ_t, Φ_f). Standard errors are clustered by supplier-customer pair level. Standard errors are clustered at supplier-customer pair level, t statistics are reported in parentheses. Statistical significance is indicated as follows: $*\ p < .1$, $**\ p < .05$, $***\ p < .01$.

Table 8. Common Lead Lender and Agency Conflicts

Dept.Var =	Sales Audit Covenants			Product Quality Covenants		
	(1)	(2)	(3)	(4)	(5)	(6)
Common Lender× Low Sup TobinQ Dum	-0.007			0.010		
	(-0.09)			(0.12)		
Common Lender× High Sup Leverage Dum		0.058			-0.195	
		(0.94)			(-1.05)	
Common Lender× High Exp. Default Freq Dum			0.036			-0.013
			(0.37)			(-0.12)
Low Sup TobinQ Dum	0.022			-0.036		
	(0.63)			(-0.79)		
High Sup Leverage Dum		0.018			0.018	
		(0.55)			(0.39)	
High Exp. Default Freq Dum			-0.015			0.018
			(-0.45)			(0.40)
Common Lender	-0.055	-0.114**	-0.057	-0.167***	0.014	-0.119
	(-1.32)	(-2.16)	(-0.66)	(-2.86)	(0.07)	(-1.16)
Controls	Yes	Yes	Yes	Yes		
Contract Types	Yes	Yes	Yes	Yes	Yes	Yes
Sup-Cus Ind FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
N	1,031	1,157	885	1,031	1,157	885
Adj. R^2	0.19	0.16	0.20	0.29	0.29	0.32

This table presents regression estimates for the relationship between supply covenants and common lender for firms with different financial risk for below model:

$$\begin{aligned}\text{pr}(\text{Clauses}_{\text{l,t,s,c}} = 1) = \alpha_l + \beta_1 \text{Common Lender}_{l,t,t-5} + \beta_2 \text{Financial Risk}_t \\ + \beta_3 \text{Common Lender}_{l,t,t-5} \times \text{Financial Risk}_t \\ + \mathbf{S}_{s,t} + \mathbf{C}_{c,t} + \Omega_l + \Lambda_t + \Phi_f + \varepsilon_{i,t}\end{aligned}$$

Table 8 presents the results using three measures of supplier *Financial Risk*$_t$: low Tobin's Q (below sample mean), high leverage (above sample mean), and high expected default frequency (above sample mean). The model includes the same controls as in Table 3. All of measures of financial risks (*Low Sup TobinQ Dum*, *High Sup Leverage Dum*, *High Sup Exp. Defalut Freq*) have interacted with Common Lender. Standard errors are clustered at supplier-customer pair level, t statistics are reported in parentheses. Statistical significance is indicated as follows: $* \ p < .1$, $** \ p < .05$, $*** \ p < .01$.

A. Covenants Examples

A.1. Sales Auditting Covenants

Commercial Supply (Manufacturing Services) Agreement between CMC ICOS Biologics, Inc. ("Supplier") and Portola Pharmaceuticals, Inc. ("Customer")

- Section 8.1 CUSTOMER AUDITS, REGULATORY INSPECTIONS & MATTERS

  Customer shall be entitled, [*], to conduct one quality audit and one financial audit (a "Customer Audit") of CMC's facility [*] in respect of Product manufacture, CMC's financial statements and records relevant to the financial statements..... **Such audit can include review of supporting information used to invoice** Customer for costs not covered by the Batch Price.

A.2. Product Quality Covenants

Commercial Supply (Manufacturing Services) Agreement between West CMC ICOS Biologics, Inc. ("Supplier") and Portola Pharmaceuticals, Inc. ("Customer")

- Section 2. MANUFACTURING SUPPLY AND APPLICABLE STANDARDS

  CMC shall perform the Services in compliance with all applicable laws and regulations, including the applicable Regulatory Obligations and FDA guidelines. Without limiting the foregoing, where the relevant stage of the Services defines the performance of that stage to be in accordance with **cGMP standards**...

OEM Supply Agreement between MYERS Power Products, Inc. ("Supplier") and GREEN LIGHT Acquisition Company ("Customer")

- Section 6. Engineering, ISO.

  ... All Modules shall be manufactured at a facility that is ISO-certified, and Supplier shall provide Customer with written evidence of such **ISO certification**, at Customer's request.

Supply Agreement between West Pharmaceutical Services, Inc ("Supplier") and scPharmaceuticals Inc.("Customer")

- Section 2. Commitment to Sell and Purchase Product.

  g. Quality Agreement... The parties entered into that certain Quality Agreement dated effective as of December 19, 2019 setting out the responsibilities of the parties with respect to **quality assurance** of the Product manufactured and supplied by West pursuant to this Agreement (the "Quality Agreement").

B. Definitions of Variables

Variable	Definition	Sources
Interested Variables		
Common Lender	Equals one if a supplier and its customer both received loans from a common lead lender at the parent firm level within the past 5 years or the year when their supply contract was made	EDGAR, LPC
Sales Auditing Covenants	Equals one if the supply contract includes the covenants that require the supplier to audit the financial information related to sales invoices, and zero in all other cases.	EDGAR
Product Quality Covenant	Equals one if a supply contract includes the covenants that require any ISO certification, FDA Current Good Manufacturing Practices (CGMP), or quality assurance.	EDGAR
ProdCovNum	The sum of product quality assurance covenants, range from 0 to 3.	EDGAR
Trade Credit (Days)	Trade credit term days supplier offer to customer	EDGAR
Hold Up Risk & Credible Communication		
Same State	Equals one if the headquarters of supplier and customer are in the same state, otherwise 0.	COMPUSTAT
Amended	Equals one if a supply contract is an amended contract, otherwise 0.	EDGAR
Supplier Cash Flow	Supplier's operation cash flow.	COMPUSTAT
Supplier Business Duration	The average length of supplier's business duration with its customers since 2003.	COMPUSTAT, Factset
Supplier Accounting Quality	The average discretionary accounting accruals of supplier or customer following (Jones, 1991) model and (Kothari et al., 2005) model.	COMPUSTAT
Supplier Age	Years between supplier's first trading date to contract formation date.	CRSP
Supplier Controls		
Sup Ln(AT)	Supplier's log value of the total asset.	COMPUSTAT
Sup Leverage	Supplier's total liabilities scaled by total common equity.	COMPUSTAT
Sup ROA	Supplier's net income scaled by the total asset.	COMPUSTAT
Sup HHI	Supplier's Herfindahl-Hirschman Index, i.e., the sum of squared market share of a 4-digit SIC industry in a given year.	COMPUSTAT
Sup Sales	Supplier's gross sales scaled by the total assets.	COMPUSTAT
Sup Exp. Default Freq	Supplier's expected default frequency from KMV model	COMPUSTAT
Customer Controls		
Cus Ln(AT)	Same definition to supplier's, but for customers.	COMPUSTAT
Cus ROA	Same definition to supplier's, but for customers.	COMPUSTAT
Cus HHI	Same definition to supplier's, but for customers.	COMPUSTAT
Cus Sales	Same definition to supplier's, but for customers.	COMPUSTAT