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Mitigating incentive conflicts in inter-firm relationships: Evidence from long-term supply contracts ☆

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ABSTRACT

Using a sample of long-term supply contracts collected from SEC filings, I show that hold-up concerns and information asymmetry are important determinants of contract design. Asymmetric information between buyers and suppliers leads to shorter term contracts. However, when longer duration contracts facilitate the exchange of relationship specific assets, the parties substitute short-term contracts with financial covenants in order to reduce moral hazard. Covenant restrictions are more prevalent when direct monitoring is costly and the products exchanged are highly specific. Finally, I find that buyers and suppliers are less likely to rely on financial covenants when financial statement reliability is low.

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1. Introduction

The nature of inter-firm relationships is of broad interest to researchers in economics, finance, and accounting. An extensive literature discusses how agency and transaction costs influence the decision to make assets internally or to buy them from an external trading partner (Coase, 1937; Klein et al., 1978; Williamson, 1979; Fama and Jensen, 1983a,b). While relationships between separately owned buyers and suppliers will be subject to opportunistic behavior, theory suggests that

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contracts can mitigate frictions by specifying the nature of the residual claims and the allocation of decision rights (Aghion and Bolton, 1992). However, there is limited empirical research that examines the nature of contracts between a firm and its suppliers and customers. I address this gap by analyzing contractual relationships between buyers and suppliers using a unique, hand-collected dataset of long-term supply contracts disclosed in SEC filings.

I develop and test predictions about how supply contracts are structured to minimize the costs associated with information asymmetry and hold-up problems between buyers and suppliers. The theoretical literature linking these frictions to the way buyers and suppliers organize is well established. Analyzing variation in the design of long-term supply contracts provides a promising empirical setting to test the theoretical framework for a number of reasons. First, supply relationships are economically significant, and the disclosed contracts represent an influential portion of the filer's revenues or purchases (Gilley and Rasheed, 2000; Rajan and Zingales, 1995). Second, the disclosed contracts provide a rich empirical setting because of the significant amount of detail regarding the transaction including characteristics of the buyer and supplier, product characteristics that can lead to hold-up problems, and important contractual features including covenants and warranties. This level of detail facilitates the empirical measurement of key theoretical constructs predicted to affect supply relationships.

I find evidence that hold-up concerns and information asymmetry are important determinants of the duration of contracts and the reliance on financial covenants in a way that is consistent with theoretical predictions. While prior studies find that accounting information is used extensively in debt and compensation contracts, the literature on supply chain relationships has largely ignored the role of financial covenants. For example, there is a growing literature on how debt contracts are designed to align lender and shareholder interests by including accounting covenants and performance pricing provisions (Smith and Warner, 1979; Leftwich, 1983; Dichev and Skinner, 2002; Asquith et al., 2005). I provide evidence that financial covenants are used in supply contracts to align buyer and supplier incentives, and I examine the extent to which covenants substitute for, or are complementary to, other contractual solutions.

To motivate the empirical analysis, I rely on the theories of adverse selection and moral hazard. Suppliers hold asymmetric information about the quality of their products and their ability to meet the demands of the buyer, and buyers hold asymmetric information about their credit quality and the demand for the downstream product. These information asymmetries result in an adverse selection problem if there is ex ante uncertainty regarding the quality of the potential buyers and suppliers (Akerlof, 1970). In addition, moral hazard is a concern if the parties cannot perfectly observe each others' actions, resulting in the potential for the buyer and supplier to act opportunistically (Holmstrom, 1979).

Rational buyers and suppliers anticipate the potential for opportunistic behavior ex ante and design the contract to mitigate these potential costs. I investigate two, potentially substitutable, contractual mechanisms used to mitigate the costs associated with information asymmetry: contract duration and financial covenants. First, I hypothesize that when information asymmetry between the buyer and supplier is high the parties enter into shorter duration contracts. Because low quality types value the protection of a long-term contract, offering short-term contracts can be used as a screening strategy to identify high ability types (Aghion and Bolton, 1987; Diamond, 1991; Hermalin, 2002). In addition, shorter duration contracts force more frequent information disclosure, allowing the less informed party to tightly monitor their counterparty and to renegotiate the contractual terms when necessary.

While shorter term contracts can be used to mitigate information asymmetry, transaction cost theory suggests that long-term relationships are important in the presence of relationship specific investments (RSIs). Because RSIs have a lower value in an alternative use, sunk investments in these assets give one party more ex post bargaining power at renegotiation (Klein et al., 1978; Williamson, 1979, 1985; Grossman and Hart, 1986; Hart and Moore, 1990). Understanding this risk, the parties will under-invest in relationship specific assets. Transaction cost theory suggests that a long-term contract that specifies the terms and conditions of the exchange ex ante reduces the potential for ex post hold-up problems.

My hypotheses indicate that, holding all else equal, RSIs lead to *longer* term contracts while information asymmetry leads to *shorter* term contracts. I predict that financial covenants substitute for short-term contracts when information asymmetry is high *and* the exchange of relationship specific assets is best facilitated by longer term contracts.

Agency theory predicts that financial covenants mitigate moral hazard by transferring decision rights to one party in those states of the world where incentive conflicts are likely to encourage inefficient behavior by the other party (Aghion and Bolton, 1992). Because agency problems are higher when financial performance deteriorates, covenants specifying minimum performance thresholds can be used to transfer decision rights to the non-defaulting party. Second, financial covenants are useful in this setting because they provide an early warning sign of financial distress (Dichev and Skinner, 2002), which is particularly important when the presence of RSIs increases the costs of finding a substitute trade partner.

To provide empirical support for the role of RSIs and information asymmetry in contract design, I develop several measures for the variables of interest. I proxy for hold-up problems using characteristics of the assets exchanged. Specifically, I determine whether an investment is required to produce the asset, and I measure the detail and complexity of the product specifications in the contract. Following prior literature, I also include the firm's R&D intensity and the proportion of differentiated inputs used in the product. To measure information asymmetry between the buyer and supplier, I calculate the geographic distance between the producing and purchasing plants because monitoring becomes more costly as distance increases. I also identify contracts with international and private counterparties, since these firms are more opaque than domestic and publicly filing firms. Finally, I search for previous interactions between the buyer–supplier pair, since prior relationships mitigate information frictions.

The empirical results are consistent with theoretical predictions; I find that, ceteris paribus, information asymmetry leads to shorter duration contracts while RSIs lead to longer term contracts. The evidence regarding the use of financial

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