Accounting Information in Financial Contracting: An Incomplete Contract Theory Perspective

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1. Introduction

The central question in accounting research on financial contracting is how accounting information facilitates transactions between financiers and those who require financing. Suppose an entrepreneur (or manager) has access to a positive NPV investment project but lacks financing and that a financier has funds but no access to such a project. How can accounting information facilitate a transaction between these two parties and how does the use of accounting information affects the choice and design of financial claims? In this article, we discuss the potential answers to these questions with particular attention given to the use of accounting information in debt contracts.

The idea that accounting information can enhance the efficiency of contracting builds on agency theory, introduced in Jensen and Meckling (1976) to explain the financial structure of firms and further developed in the context of the accounting literature by Watts (1977), Watts and Zimmerman (1978), Holthausen (1981), Leftwich (1983), Holthausen and Leftwich (1983), and Watts and Zimmerman (1986). The primary premise of the agency theory perspective is that accounting information facilitates the contracting process by reducing the agency costs associated with outside financing (Jensen and Meckling, 1976).

In the context of debt financing, a manager acting on behalf of shareholders may take actions that increase the riskiness of the firm (asset substitution) or dilute the value of existing debt claims (claim dilution) or fail to take profitable investment opportunities (debt-overhang). Borrowers have incentives to enter contracts that limit such behavior because creditors rationally
anticipate and price-protect against opportunism, forcing the borrower to bear the costs. Financial contracts can use accounting information to provide incentives against opportunistic actions and thus protect creditors’ interests. This can be done by including covenants in debt contracts that ensure sufficient financial interest of shareholders in the firm or restrict opportunistic actions by management. Such covenants may limit dividend payouts, capital expenditures, asset sales, or the issuance of additional debt, and are often contingent on accounting information. Therefore, the agency perspective implies that the contract efficiency role of accounting information is driven by its ability to limit or provide incentives against opportunistic behavior by the borrower.

The arguments based on the agency perspective are clearly important and have allowed accounting research to make significant progress in understanding the role of accounting information in debt contracting. Research has documented: (i) the widespread use of accounting measures in formulating contractual provisions (e.g., Leftwich, 1983), (ii) the significant effect of accounting information properties on debt contract design (e.g., Beatty, Ramesh, and Weber, 2002, Ball, Bushman, and Vasvari, 2008, and Zhang 2008), (iii) the influence debt contracts have on accounting choice (e.g., Skinner 1993, Sweeney, 1994, and Defond 1994), and (iv) associations between accounting-based contract contingencies, such as covenants and performance pricing provisions, and the cost of debt (e.g., Bradley and Roberts, 2004, and Asquith, Beatty, and Weber, 2005).

Although these findings support the general notion that accounting improves debt contract efficiency, less progress has been made with respect to understanding the economic mechanism through which these gains are realized (e.g., Armstrong, Guay, and Weber, 2010). In particular, the agency theory perspective does not directly address several important questions.
What is the role of decision rights in debt contracting? For example, why do debt contracts not allow creditors to veto any decision made by the borrower as a way of avoiding opportunistic actions by the management? Why do debt contracts feature simple covenant packages? Why do credit agreements require the maintenance of performance ratios, as opposed to addressing the scope for various opportunistic actions more explicitly? Why do we have frequent renegotiations of accounting-based covenants? What is the value of including a covenant in a debt contract if it is subsequently renegotiated? And, finally, why do creditors use accounting-based covenants to actively participate in the governance of borrowers?

In our view, the literature can make more progress in these areas by complementing the agency theory with another theoretical perspective. In particular, we suggest that incomplete contract theory broadens our perspective on the role that accounting information plays in debt contracting. Incomplete contract theory has its roots in Coase’s (1937) work on the theory of the firm, but it has gained traction more recently, with key contributions from Klein, Crawford, and Alchian (1978), Grossman and Hart (1986), and Aghion and Bolton (1992).

The central tenet of this theory is that contracts are inherently incomplete because the contracting parties cannot anticipate or explicitly describe some future states of the world. This gives rise to hold-up problems that adversely affect the incentives of the contracting parties to enter contracts. Specifically, because a contract cannot specify all future states or actions, there will inevitably be contract renegotiations in which one of the parties can behave opportunistically. For example, borrowers may sometimes use asset substitution as a threat to extract concessions from creditors. Similarly, creditors can extract rents if the borrower discovers a new profitable investment project that requires modifications to the initial contract.
The mechanism that addresses future opportunism is the ex ante allocation of decision power (control rights) in the contractual relationship. In particular, control rights are important because they determine the status quo in future renegotiations and hence affect the division of the surplus, which, in turn, has important ex ante efficiency implications. One of the key principles guiding the allocation of decision rights is that control should be given to the party whose decisions will contribute more to the joint surplus (value created by entering the contract). Applying this principle to debt contracting, the borrower and creditors will agree to allocate control to the party that has incentives to make value maximizing decisions when the future unfolds.

Accounting information plays an important role within the incomplete contract theory. Because the party with value maximizing incentives is state contingent and the state is typically non-contractible ex ante, it is optimal to make the control allocation contingent on some contractible signal that reflects the underlying economics of the borrower (Aghion and Bolton, 1992, Zender, 1991, and Hart and Moore, 1988). Since the accounting reporting system is a measurement system that produces summary measures of firm performance, the accounting signal becomes a primary candidate on which to base state-contingent allocation of control rights. Therefore, from the incomplete contract perspective, accounting information can improve contracting efficiency by enhancing the state-contingent allocation of control rights.

Note that the traditional agency and incomplete contract theories are not mutually exclusive and there is a substantial overlap in terms of contracting frictions. Both theories address conflicts of interest between the contracting parties and the scope for opportunistic behavior. In this respect, the central principles of agency theory, such as the notion that contracting parties will select ex ante the accounting practices that minimize ex post opportunism
(e.g., Watts and Zimmerman, 1990), also apply to incomplete contract theory. However, the key distinction between the two theoretical perspectives is that agency theory does not view accounting-based covenants as a tool to allocate decision power in the contracting relationship. Incomplete contract theory thus explains why lenders play an active role in corporate governance and why such role relies on the use of accounting-based covenants. This differs from the role of covenants in incentives alignment and bonding that arises under the agency perspective. We suggest that incomplete contract theory has a great deal of potential in explaining the mechanisms through which accounting information enhances debt contract efficiency.

The objective of this review is to draw on the existing theory and empirical work to advance our understanding of the efficiency role of accounting information in debt contracting. Armstrong, Guay, and Weber (2010) have highlighted that the incomplete contract framework contains the potential for new and interesting research avenues. We build on their initiative and discuss how advancements in economic theory can help us move accounting research forward. Our review thus gravitates toward studies that are related to incomplete contract theory. Surveys on financial contracting by Hart (2001) and Roberts and Sufi (2009b) have also reviewed the literature on incomplete contract theory, but they primarily focus on corporate-finance-related issues.

In Section 2, we discuss agency and incomplete contracting theories in greater detail, as well as their implications for accounting research. We focus our discussion on several key theoretical concepts that pertain to the efficiency role of accounting information in debt contracting. In Section 3, we present empirical evidence and examine how it aligns with the agency and incomplete contract perspectives. Given the relatively narrow focus of this review, we limit our discussion to the most relevant papers and do not attempt to do justice to the
extensive accounting literature on debt contracting. In Section 4, we discuss several open questions in accounting research on financial contracting and illustrate how the theory discussed in Section 2 can help researchers striving to address them.

2. Theoretical foundations and implications for accounting research

In this section, we review theories that provide insights into the efficiency role of accounting information in financial contracting. We also discuss the main implications of these theories for empirical accounting research. In line with existing theory, we define contract efficiency as the total value, or “joint surplus,” that is realized by parties entering into a contract.

2.1. Agency theory and the role of accounting information

In a world without contracting costs, such as the one considered by Modigliani and Miller (1958), financial structure of the firm is irrelevant and there is no contracting role that accounting information can play. This role emerges when one introduces agency conflicts and information problems (Watts and Zimmerman, 1990). Agency theory, developed in a seminal paper by Jensen and Meckling (1976) to explain the financial structure of firms, is the foundation of positive accounting theory (Watts and Zimmerman, 1986). Under the agency perspective, the contract efficiency role of accounting comes from the role that accounting information plays in reducing agency costs (e.g., Watts, 1977, Watts and Zimmerman, 1978, Holthausen, 1981, Leftwich, 1983, Watts and Zimmerman, 1986, and Holthausen and Leftwich, 1983). In the accounting literature, most empirical papers on financial contracting broadly rely on agency theory to form predictions and interpret evidence.

Jensen and Meckling (1976) draw on the theory of agency relationships developed in economics (e.g., Ross 1973, see also Holmstrom 1979) to propose a theory of firms’ financial structure. Under the assumption that equity and debt are used as claims, they characterize an
optimal combination of outside equity and debt chosen to balance the “agency costs” introduced by the use of these securities. Outside equity gives rise to a conflict of interest between the owner-manager (agent), who holds only a fraction of equity, and the outside shareholders (principal). Since outside shareholders bear a portion of the costs of the manager’s actions after they provide financing, the manager loses incentives to exert effort and may engage in unproductive activities, such as the consumption of private benefits. As the fraction of assets financed via outside equity increases, so do the incentive problems and hence the agency costs of equity.

Jensen and Meckling (1976) show that one way to incentivize the manager (e.g., to reduce the consumption of private benefits) is to rely on debt instead of outside equity. Since debt is a fixed claim, the owner-manager will fully internalize the costs and benefits of her actions, which resolves the incentives problem. Debt financing, however, introduces other types of agency costs (Jensen and Meckling 1976, Myers 1977, Smith and Warner 1976). In particular, Jensen and Meckling (1976) argue that the owner-manager gains incentives to invest in projects with greater risks, known as asset substitution, even if doing so destroys firm value. This happens because an equity claim can be viewed as an option on a firm’s assets (Merton 1973) – if a risky project pays off, the owner-manager reaps the benefits but, should the project fail, debtholders bear the losses. As debt levels increase, so do the manager’s incentives to take excessive risk. Given this, a combination of debt and equity, at which the marginal agency cost of equity equal the marginal agency cost of debt, determines the optimal financial structure of the borrower.

An important implication of agency theory is that the entrepreneur bears the agency costs associated with outside equity and debt because rational investors will anticipate and price-
protect against these costs (Jensen and Meckling, 1976, Myers, 1977). As a result, the entrepreneur is interested in establishing a governance system that improves her incentives and limits activities that harm outside investors, namely, by subjecting herself to monitoring or bonding against taking certain actions. To achieve this, the owner-manager could issue debt that (1) avoids dilution of owner-manager’s share of equity and (2) comes with a contract that specifies a comprehensive set of covenants. Covenants can impose direct limitations on various types of managerial actions and are often contingent on accounting information, e.g., net worth or indebtedness (Leftwich, 1983). For example, covenants could require that the borrower provides audited financial statements and use the information from these statements to restrict or limit dividend payouts, capital expenditures, issuance of debt, M&A transactions, asset sales, etc. (Smith and Warner, 1979).

This suggests that the role for accounting information in contracting is due to its role in facilitating bonding and monitoring activities. To this end, accounting-based covenants limit dysfunctional activities and hence reduce the agency cost associated with the use of debt or outside financing more generally. This insight is perhaps best summarized in Watts and Zimmerman (1986, p. 199): “The contracting role of accounting allows accounting procedures to have a cash flow and valuation effect. If a contract’s effect on agency costs varies with the procedures to calculate the accounting numbers used in the contract’s covenants, the firm’s and/or manager’s cash flows vary with the accounting procedures.”

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1 The takeaways from Myers (1977) are closely related to those in Jensen and Meckling (1976). Rather than focusing on risk shifting, Myers (1977) considers incentives for suboptimal future investments decisions by opportunistic shareholders (or managers acting in their interest) after debt has been issued. The scope for opportunistic investment decisions can also explain managers’ incentives to bond against suboptimal actions through accounting-based covenants.

2 Smith and Warner (1979, p. 117) define a covenant as “a provision, such as a limitation on the payment of dividends, which restricts the firm from engaging in specified actions after the bonds are sold.”

3 Accounting also pays a role in reducing the agency costs associated with equity because financial statements can be used to monitor the manager. Auditing can play a similar monitoring role (Watts and Zimmerman, 1983).
Given the contracting efficiency link between accounting and firm value developed and articulated by Watts and Zimmerman, it is not surprising that the agency perspective has been so influential in the accounting literature. The idea that accounting information can be used to improve incentives and limit opportunistic behavior is important and helps to explain the widespread use of accounting numbers for contracting, the choice among accounting procedures, the economic consequences of accounting changes, and the effect of accounting information on contract design.

However, there are some contracting aspects that agency theory does not address or provide clear explanations for. Why is it the case that many debt contracts include relatively few covenants? Under the agency perspective one could expect a comprehensive set of detailed covenants and performance indicators. Second, accounting-based covenants are frequently renegotiated outside of financial distress (Dichev and Skinner 2002). What is the value of committing to a covenant if such covenant is subsequently renegotiated? Why do lenders’ actively participate in firm governance during such renegotiations? Debt contracts often rely on financial covenants that do not appear to directly limit or incentivize certain actions by the borrower. Instead, some covenants require a borrower to adhere to a pre-specified threshold of performance or interest coverage. One could argue that such covenants improve incentive alignment between creditors and shareholders but, within the agency theory framework, this argument is hard to reconcile with frequent renegotiations of covenants. The provision of incentives calls for commitment against renegotiation (Fudenberg and Tirole 1990).

The incomplete contract theory perspective on the design of financial contracts offers some explanations for these empirical observations. We return to a more detailed discussion of

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4 The role of accounting in monitoring was discussed in the literature prior to Watts and Zimmerman’s work but the underlying theory was lacking. See, for instance, the discussion on the purpose of accounting in the introduction to *Principles of Accounting*, first published in 1917 (Paton and Stevenson, 1917).
these explanations in Section 2.3, after our discussion of the key principles of incomplete contract theory in Section 2.2.

2.2. Incomplete contract theory and the role of accounting information

The theory of incomplete contracts builds on seminal work by Coase (1937).\textsuperscript{5} Coase argued that it is costly to rely on market transactions that coordinate economic activities by writing and negotiating comprehensive long-term contracts. He reasoned that long-term contracts can, realistically, only specify the limits of what the contracting parties are expected to do in the future so that the exact details about the future course of action are to be worked out at a later date. In turn, this creates the demand for authority or decision power, which serves as a main justification for why firms come into existence. Klein, Crawford, and Alchian (1978) and Williamson (1979), among others, laid out further foundations for this theory by considering opportunistic behavior that stems from contractual incompleteness. Building on the intuitive ideas introduced in this literature, a more formal theory of property rights was advanced by Grossman and Hart (1986) and Hart and Moore (1990), who emphasize trade-offs associated with the use of authority more rigorously.

The main idea in the incomplete contracting literature is that there are economic benefits from selling or assigning “control rights”, also referred to as “decision rights” or “property rights”, in circumstances where it is difficult to write and enforce “complete contracts”. The key assumption made in this literature is that many future contingencies are left out of the initial contract and, therefore, the contract is to be revised via future renegotiations. There are several sources of contractual incompleteness: (1) it is prohibitively costly to foresee and thus

\textsuperscript{5} There is no commonly accepted definition of incomplete contracts. In general, contracts are considered to be incomplete when they cannot contract on all relevant information and leave out some decision to be agreed upon in the future. Sources of contractual incompleteness include contracting costs associated with multiple future contingencies, lack of information verifiability, lack of enforceability of contracts written on certain information, and indescribability of the future states of nature at the time of contact initiation.
incorporate a long list of future contingencies into the initial contract; (2) the future state of nature is often complex and hence is difficult to describe contractually; (3) some contingencies may not be enforceable because they are based on information that cannot be verified by a third party (e.g., in a court of law). As a result, instead of specifying a comprehensive list of future actions to be taken and payoffs to be realized in various future states of the world, contracts need to consider how to allocate the control rights over decisions that will need to be made when the future unfolds. In other words, one party may decide to sell control rights over unanticipated contingencies to another party to the contract in order to facilitate the future decision making process.

The central source of tension within this framework arises because an incomplete contract creates scope for opportunistic behavior, which is usually referred to as a hold-up problem (e.g., Williamson, 1975, and Klein, Crawford, and Alchian, 1978). Hold-ups destroy incentives to enter contracts ex ante and lead to deadweight losses. In particular, because contracts cannot specify the course of action in every future contingency, future renegotiations can take an opportunistic form where one of the parties abuses a stronger bargaining position to extract quasi-rents. The most prominent example here is a buyer-supplier relationship that necessitates (non-contractible) relationship-specific investments. Since such investments are sunk costs, the bargaining position of the investing party, e.g., the seller, deteriorates after the

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6 For example, it would have been hard to predict back in 2012 that there would be economic sanctions against certain major Russian companies. Such sanctions are a very relevant contingency for parties contracting with these companies and these parties would, of course, prefer to have included provisions for the sanctions in their contracts (e.g., to mitigate hold-up concerns and facilitate long-term investments in buyer-supplier relationships, Costello 2013). Another example that is perhaps more directly related to accounting is off-balance sheet financing. Over the past 40 years, new ways to raise off-balance sheet financing have been constantly emerging. Therefore, it would be difficult to anticipate or foresee all the possibilities for future off-balance sheet financing at the time of contract initiation. It would also be difficult to restrict these unanticipated off-balance sheet transactions contractually, because to be enforceable a contract should clearly describe what types of future transactions should or should not be presented on the balance sheet and hence included in covenant compliance. In practice, the world is too uncertain for all eventualities to be anticipated, and even if they could be, some would be difficult to describe in a way that would make them enforceable in a court of law.
investment is made and the scope for opportunistic renegotiation by the buyer arises. In the context of financial contracts, a borrower may threaten to engage in an unanticipated risky project after a contract is in place and use this threat to extract concessions from creditors (Dewatripont and Maskin 1995). Alternatively, an entrepreneur may worry about being held up by lenders who threaten to recall the loan or not extend additional credit before a project is complete (Sharpe 1990, Rajan 1992).

While these conflicts are not easy to resolve, the general approach proposed by the incomplete contracting literature to alleviate holdup problems is to assign control rights to the party whose actions are relatively more important in creating contractual surplus, i.e., creating value (Grossman and Hart, 1986, and Hart and Moore, 1990). Allocating control to the party with firm value maximizing incentives is particularly helpful in addressing costly-to-anticipate-and-describe future states of the world. For example, an entrepreneur should enjoy control rights when a profitable investment opportunity becomes available to avoid rent extraction by lenders.

It is natural to apply the ideas of incomplete contract theory to understand financial contracts and, in particular, the efficiency role of accounting information in debt contracting. Accounting-based covenants can be viewed as state-contingent control rights that are sold by borrowers and acquired by lenders. These ideas are discussed in the following subsections.

2.2.1. Efficiency rationale for accounting-based covenants within incomplete contract theory

Aghion and Bolton (1992), Zender (1991), and Dewatripont and Tirole (1994), among others, are the key contributions to the literature on optimal security design under contractual incompleteness. These studies emphasize the importance of state-contingent control allocations when the entrepreneur must access outside financing.
Aghion and Bolton (1992) is perhaps the most influential paper on financial contracting in the presence of contractual incompleteness. They consider a setting where a wealth constrained entrepreneur seeks financing from a wealthy investor. The project requires an action by the entrepreneur that depends on the future state of nature. However, neither action nor the state of nature is contractible due to lack of verifiability. The objectives of the entrepreneur and investor are not congruent: the investor cares only about future cash flows, whereas the entrepreneur derives utility both from a monetary return and from the non-monetary “private benefit”. (The private benefit can be thought of as utility from managing the firm, reputation, human capital that will be useful to the entrepreneur in developing ideas in the future, or simply in terms of disutility from taking an action.) Given this, the investor and entrepreneur may disagree about the optimal course of action to be taken in the future. The first-best (efficient) solution to this problem would be achieved if the entrepreneur fully internalized the costs and benefits from her actions. However, because the outside investor must be compensated via a portion of future cash flows, the entrepreneur loses incentives and may act opportunistically, i.e., choose to continue the project for the non-monetary benefit even when liquidation is efficient. In contrast, the investor, who is only interested in cash flows, may liquidate the project even if continuation is efficient, e.g., because the investor does not care about the human capital of the entrepreneur.

How should this conflict of interest be resolved? Aghion and Bolton (1992) discuss two solutions when the initial contract cannot specify a course of action in every future state of the world. The first solution is to contract in a way that aligns the incentives of both the entrepreneur and the investor. This solution echoes the solution from principal-agent theory where the agent is placed on a monetary compensation scheme. Incentive alignment, however, may be difficult to
achieve because the entrepreneur may need to be given such a large part of cash flows (to motivate the optimal action when contracts cannot depend on the state) that the outside investor is insufficiently compensated for the initial investment. The second proposed solution to this problem is to separate the cash flow rights and control rights and use them as independent contracting instruments. In the instances where it is impossible to align incentives ex ante, the allocation of decision rights, can improve the contracting outcome.

An important takeaway from Aghion and Bolton (1992) is that the optimal financial contract will generally make control allocation contingent on a contractible signal that serves as a noisy summary measure of the non-contractible state of nature. That is, the entrepreneur will assign control rights to investors only in a certain range of the signal’s values (e.g., during poor performance). A firm’s accounting performance indicators are natural candidates for this purpose. Aghion and Bolton (1992) argue that debt financing comes closest to resembling the optimal contract that implements state-contingent control allocation. Specifically, a debt contract with covenants written on accounting performance measures can be used to grant decision rights to the entrepreneur in states of the world where the company is doing well. In those states, maximizing the value of equity is also likely to maximize the value of the firm (the sum of monetary and non-monetary returns). In contrast, in states of the world where the company is performing poorly and the entrepreneur may have incentives to take an inefficient action (e.g., to inefficiently continue the project), covenants reallocate control to the lender.

It is worthwhile to note that control allocation can, in principle, be carried out based on non-accounting signals. For instance, lenders can obtain more control rights when the borrower defaults on its payment. However, payment status may be too crude of a measure of the state and often lacks timeliness. Accounting-based performance measures are likely to be finer signals of a
firm’s economics, consistent with what we observe in both public and private debt contracting practices.

Two influential papers complement the results in Aghion and Bolton (1992) and also speak to the importance of state-contingent control allocation conditional on a firm’s accounting performance: Zender (1991) and Dewatripont and Tirole (1994). Both studies also address the question of optimal security design in the presence of contractual incompleteness. Zender (1991) considers an entrepreneur who has a profitable investment opportunity that cannot be fully financed by a single investor (e.g., the entrepreneur). There is a conflict of interest between the insider who controls the company and the outside investor. Namely, in some states of the world, the controlling insider (manager) has incentives to invest inefficiently, e.g., to substitute assets, which cannot be resolved directly due to contractual incompleteness (the inability to write contracts in the interim state). Zender’s (1991) main finding is that the optimal financial structure will most closely resemble the use of both equity and debt, where the control allocation between the two types of claimholders is made contingent on a signal about the non-contractible state of the world. When the realization of this signal is “high”, the equityholder retains control rights and the residual value of the cash flow rights, whereas the debtholder has a claim to receive a fixed payment. In contrast, if the signal is “low”, the debtholder obtains control. The co-existence of debt and equity also emerges endogenously within the incomplete contracting framework of Dewatripont and Tirole (1994), who find that the combination of two outside claims improves managerial incentives.

The main takeaway from Zender (1991) and Dewatripont and Tirole (1994) echoes that of Aghion and Bolton (1992). Out of many allowable financial instruments, the claim that emerges endogenously as a part of the optimal security design is one that features state-
contingent control allocations and most closely resembles a debt contract with covenants written on an accounting signal, such as profitability. Another broad takeaway from these papers is that accounting information used by the accounting-based covenants that accompany debt financing plays an important role in a borrower’s governance.

2.2.2. Accounting-based covenants and the strategic role of renegotiations

In the above framework of Aghion and Bolton (1992) and Zender (1991), control is allocated to the party that has incentives to take the more efficient action ex post. For example, lenders should receive control when liquidation is efficient, while the entrepreneur should maintain control when continuation is efficient. In these models, contract design plays no role in stimulating the ex ante effort of the manager or entrepreneur. However, the transfer of control rights contingent on accounting-based information signals can also affect contract efficiency via an effect on the manager’s ex ante behavior (as, for example, in Dewatripont and Tirole, 1994). In particular, because the use of covenants can shape the incidence and the outcome of future renegotiations, it can also alter the manager’s ex ante behavior.

This “strategic view” of contractual clauses in the renegotiation of incomplete contracts was advanced in Huberman and Kahn (1988; see also Huberman and Kahn, 1989). These authors argue that contractual clauses can be used to assign control rights ex ante in a way that becomes suboptimal ex post and hence triggers renegotiation (which in turn restores ex post efficiency). As such, these “restrictive” clauses can be beneficial from the ex ante incentives perspective, when, due to limitations on contractual complexity, it is not possible to directly specify actions to be taken ex ante (or contract on the future states of the world). Because the initial contract serves as the “disagreement point” in future renegotiations, even if the parties tear up the initial contract and write a new one, the original contract still affects the eventual payoffs and thus can influence
ex ante incentives. While this general idea is also applicable to Grossman and Hart (1986), an important distinction is that the ex ante control allocation is designed to be suboptimal in the ex post sense and triggers future renegotiation that restores efficiency (i.e., reallocates control to the party who values it most). Hence control allocation in conjunction with future renegotiation plays a strategic role. Huberman and Kahn (1988) make an observation that the default provisions in debt contracts, i.e., covenants, work in this way.

A complementary view on the role of contract design in shaping future renegotiations is offered in an influential study by Aghion, Dewatripont, and Rey (1994) (see also Aghion, Dewatripont, and Rey, 1990). The authors argue that it is possible to alleviate the holdup problems in future renegotiations by specifying clauses that shift the bargaining power to one of the two parties. Similarly, these clauses shape the outcome of renegotiation and thereby improve ex ante incentives to invest or exert effort.

The theory developed in these studies points towards a not well understood strategic role of accounting-based covenants in future renegotiations. Specifically, covenants can be set tightly to reallocate control rights to lenders despite the lenders’ lack of incentives and/or ability to take value maximizing actions when granted control (e.g., they may have incentives to liquidate when continuation is optimal). Such a control transfer creates scope for renegotiation that eventually reassigns control back to the borrower. However, in the process, lenders can use their power to extract part of the renegotiation surplus from the borrower. This, in turn, can have a favorable effect on contract efficiency. Effectively, renegotiations serve as a threat that provides managers with incentives to exert effort and thus alter managers’ ex ante behavior.

In a number of more recent studies, the role of accounting-based covenants is analyzed more explicitly. In these studies, covenants are used to provide stronger control rights to a less
informed or less “protected” party (Berlin and Mester, 1992, Sridhar and Magee, 1996, Gorton and Kahn, 2000, and Garleanu and Zwiebel, 2009). These studies generally suggest that in the presence of moral hazard, covenants are valuable because they are set tightly ex ante so that they can be selectively waived or relaxed ex post (see also Smith, 1993 and Dichev and Skinner, 2002). One important takeaway from this line of research is that the value of covenants comes from the ability to renegotiate them in the future, which is in line with the strategic (incomplete contracts) view of accounting-based covenants.

2.3. Comparison of the agency and incomplete contract theory perspectives

In this subsection, we reconcile the two perspectives on the efficiency role of accounting information in financial contracting. Both the agency and the incomplete contracting perspectives have much in common and offer complementary approaches to understanding the role of accounting in financial contracts. Both perspectives address conflicts present between those who manage the firm and those who provide financing. Under both perspectives, accounting-based covenants address incentive problems that arise in response to the underlying conflicts among the stakeholders of the firm (managers/shareholders and debtholders). However, the two perspectives have important distinctions in terms of their focus and the mechanism through which the contracting problems are addressed, as we discuss next.

2.3.1. Control rights vs. incentive schemes

The classic agency perspective addresses a principal-agent problem, where the principal designs an optimal contract to incentivize an agent to take an action (exert effort). Actions that are directly observable are penalized or explicitly restricted by the contract (bonding) at the time of its initiation. Actions that are imperfectly observed can be induced via incentive schemes that tie the agent’s monetary compensation to an imperfect measure(s) of firm performance.
Accordingly, the purpose of accounting-based covenants is to either directly restrict opportunistic actions or establish incentives against them. In practice, we observe covenants that directly limit certain actions such as dividends payouts, issuance of additional debt, excessive capital expenditures, etc. Such covenants can rely on accounting indicators to specify regions where an action is restricted. Other covenants can be viewed as implicit incentive schemes. For example, net worth requirements could have an incentive effects that motivate managers acting on behalf of shareholders to pursue value maximization (to the extent shareholders have sufficient capital in the firm they internalize the costs of inefficient actions).

In the incomplete contracting framework, contracts address opportunistic behavior in a different way. Monetary incentive schemes, which grant the rights to future cash flows to the agent, are generally not sufficient to both provide proper incentives and meet the return required by outside investors (Aghion and Bolton, 1992, Dewatripont and Tirole, 1994). As a result, there is a need to separate cash flow rights (which continue to play an incentive role) and decision rights and use them as independent instruments. The basic idea in Aghion and Bolton (1992) is that, rather than relying on monetary incentives to motivate the agent to take a desirable future action in various future states (which is generally costly and may not be feasible), it is easier to allocate decision rights to the party that has incentives to take the efficient action. In other words, contracting is done without restricting or trying to induce certain actions but instead by transferring decision rights to the party with proper incentives. Under this view, accounting-based covenants become a control allocation device. Therefore, within the incomplete contracting perspective, the primary role of accounting information is to provide contractible signals that facilitate state-contingent control allocations. Such signals, in general, need not be the same as the signals that are most informative about managerial actions (e.g., effort). This is

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7 Or, alternatively, strategically assign control rights to improve effort ex ante (see section 2.2.2.).
because the optimal decision depends on the state of the world that may contain information beyond managerial effort.

2.3.2. Optimality of financial claims and the governance role of accounting information

As discussed by Hart (2001), the agency theory developed in Jensen and Meckling (1976) runs into a difficulty when explaining why what closely resembles a classic principal-agent problem between outside investors and the entrepreneur needs to be addressed via a combination of debt and equity. Jensen and Meckling (1976) rationalize the use of debt with covenants as a way to preserve the entrepreneur’s concentrated ownership (although debt cannot go far enough in doing so despite the use of covenants that limit the emerging debt-equity conflict). However, the solution to the principal-agent problem that emerges from the literature in economics is to put the agent on an optimal compensation scheme. Therefore, the theory in Jensen and Meckling (1976), which takes the use of debt and equity securities as given, does not fully explain why we need debt in combination with accounting-based covenants, instead of compensation schemes, to perform a governance role.

In contrast, the incomplete contract theory addresses the question of security design more directly and derives, rather than assumes, the use of a combination of equity and debt financing (e.g., Aghion and Bolton 1992, Zender 1991, Dewatripont and Tirole 1994). The assignment of control rights emerges as a central element of the optimal governance structure. One of the main takeaways from this literature is that unilateral control, under which only one party maintains control in all future states, is generally dominated by control allocation that is contingent on a measure of firm performance. Thus, incomplete contract theory derives the demand for securities that feature control allocation contingent on information about borrowers’ performance. Under this view, accounting-based covenants in debt contracts play a direct role in firms’ governance.
2.3.3. **Covenants and lender opportunism**

Another consideration that is central to incomplete contracts but does not receive much attention in Jensen and Meckling (1976) is the issue of lender opportunism. Both borrowers and lenders can behave opportunistically when they maintain decision rights and this is an important consideration in designing control allocation rules.

While prior research has recognized that when debtholders are in control they may act in their own self-interest and maximize the value of their claims rather than firm value (e.g., Sharpe, 1990, Rajan, 1992, and Hauswald and Marquez, 2003, 2006), the agency perspective mainly focuses on opportunism on the borrowers’ part (e.g., asset substitution and excessive risk taking). As a result, restrictions on managerial actions are costly only because they limit the manager’s flexibility. However, in this case the agency conflict associated with debt financing can be resolved by giving the lenders the power to interfere or veto any decision by the borrower. We do not generally observe such contracts.8

In contrast, the incomplete contract theory explicitly recognizes that either party to a contract has incentives to act in their own interest and may do so at the expense of the other party. This theory recognizes that there are states of the world where lenders may holdup the borrower and extract rents. As a result, accounting-based covenants determine the allocation of control by taking into account the possibility of lender opportunism.

2.3.4. **Contract renegotiations**

The issue of contract renegotiation is another key distinction of the incomplete contract

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8 Jensen and Meckling (1976) and Smith and Warner (1979) circumvent this argument by referring to the “symmetry property” of opportunism (Smith and Warner, 1979, p. 130): “If the indenture were to require the bondholders (rather than the stockholders) to establish the firm’s investment policy, the problem would not be solved; the bondholders, acting in their self-interest, would choose an investment policy which maximized the value of bonds, not the value of the firm.” In spite of this argument, lender opportunism is not incorporated as an integral part of the theory.
theory. Complete contracts do not feature renegotiation in equilibrium (e.g., Maskin and Moore 1999). The classic solution to the principal-agent problem predicts that compensation schemes will be “complete” in the sense that the contract will use all variables that provide incremental information (Holmstrom 1979) and it will not be renegotiated (Hart 1995). In part, this is because the outcome of renegotiation can be anticipated and incorporated into the initial contract (as long as one does not borrow assumptions from the incomplete contract literature). Additionally, commitment not to renegotiate generates stronger incentives when solving the principal-agent problem (Fudenberg and Tirole 1990). As a result, one should expect to see institutional features that prevent renegotiations such as reliance on a diffuse debt ownership.

Jensen and Meckling (1976) do not consider the issue of contract renegotiation, although it can have important implications for their arguments. Specifically, while the borrower can engage in inefficient behavior, such as asset substitution, it is not clear why such behavior would be observed in equilibrium. Similarly, the problem of debt overhang considered in Myers (1977) can also be resolved or mitigated via ex post renegotiation. This suggests that without taking the possibilities for future renegotiation and the bargaining power of the contracting parties into account, it is difficult to fully understand the agency conflicts’ implications, as well as the efficiency role of accounting information in contracting.

In contrast, contract renegotiation is a central element of incomplete contract theory. Due to the nature of incomplete contracts, renegotiation is expected to be a wide-spread phenomenon that occurs in equilibrium and reduces or eliminates ex post inefficiencies. Furthermore, the assignment of control rights stipulated by the initial contract establishes the status quo (or, in more technical terms, the point of disagreement) when future renegotiations are considered or carried out. Therefore, the role of control rights is to influence the scope for renegotiation as well
as the division of the surplus in future renegotiations, which in turn can affect ex ante incentives of the contracting parties.

2.4. The role of accounting measurement in contracting.

One important limitation of the agency and incomplete contract theories discussed above is that they take measurement and the properties of accounting information as given. In other words, it is assumed that an accounting system measures the underlying state of nature in an exogenous way. However, one of the key questions in the accounting literature is how should accounting rules be chosen when measuring the economics of the firm (Watts and Zimmerman 1990)? In other words, how should the measurement system be designed, i.e., what rules should be used and what properties should accounting information have (e.g., neutrality, verifiability, relevance) to best facilitate the contracting process?

One popular view suggests that contracting is more efficient to the extent that accounting rules are conservative. Accounting rules are conservative when they require a greater degree of verification for economic gains than economic losses (Watts, 2003, and Ball and Shivakumar, 2005). Intuitively, conservatism is beneficial because it arguably curtails opportunistic behavior on the part of borrowers. A number of recent studies capture these arguments more formally by endogenizing the properties of the accounting signal. One such example is Gigler et al. (2009), who argue that accounting conservatism entails a trade-off in the context of the liquidation-continuation decision for a project: it increases the informativeness of the accounting signal in the upper tail of the distribution and reduces the informativeness at the lower tail. As a result, depending on whether the inefficient project continuation (failure to liquidate a bad project) is more costly than inefficient liquidation (liquidation of a good project), accounting conservatism may or may not be a socially efficient measurement property. In other words, conservatism is
desirable to the extent that a failure to liquidate a bad project is more costly than inefficient liquidation of a good project (a false alarm). Gigler et al. (2009) consider what may be thought of as a benchmark case, where they effectively assume away any contractual incompleteness, distortions of accounting information, agency or information asymmetry problems. Several subsequent studies focus on how relaxing these assumptions affects the role of conservatism; these studies generally conclude that conservatism is indeed a desirable property, as discussed next.

Caskey and Hughes (2012) and Lu et al. (2012) take the incomplete contracting perspective and add a decision about a project selection in the interim, which potentially involves asset substitution. They show that accounting-based covenants written in terms of a conservative accounting signal are more effective at deterring inefficient investments, e.g., asset substitution. Chen, Hemmer, and Zhang (2007) and Gao (2013) find that accounting conservatism is generally beneficial from a contracting perspective in the presence of management’s influence on the measurement process, namely, earnings manipulations. One of the innovations in Gao’s (2013) work is an explicit consideration of the measurement process – an approach that directly ties incomplete contract theory to transaction characteristics and hence explains the contracting role of accounting at a more fundamental level.

An important takeaway from this line of research is that properties of accounting information and the design of accounting rules affect contract efficiency. Indeed, accounting can be viewed as a measurement system that generates informative signals about the state of nature a firm is in and the properties of this measurement system can be designed to facilitate the contracting process. Overall, this suggests that accounting measurement plays a role in the assignment of control rights in a state-contingent fashion.
2.5. **Summary**

Incomplete contract theory attributes a central role to the use of accounting information in contracting. One of the key takeaways from this theory is that contractual provisions written in terms of an information signal emerge endogenously as an important element of optimal security design. Therefore accounting-based covenants serve as a mechanism for allocating control rights between the borrowers and lenders in an efficient manner, i.e., in a manner that minimizes opportunistic behavior. Another important takeaway from the incomplete contracting framework is that covenants are valuable because they are easily renegotiated. This ability gives a strategic meaning to the use of covenants in that they can be used to provide incentives and alleviate moral hazard problems, making them an integral part of a borrower’s corporate governance. Overall, the incomplete contracting perspective is likely to prove useful in enhancing our understanding of accounting-based covenants and in moving the literature forward.

3. **Empirical evidence: Agency and incomplete contracting perspectives**

3.1. **Overview**

As discussed in Section 2, under the agency and incomplete contracting perspectives accounting-based covenants can improve efficiency through conceptually different mechanisms. Under the agency perspective, the role of covenants is to limit value reducing actions. They control managerial behavior via improved incentives or direct limitations on managers who may engage in opportunistic actions after debt is issued. Under the incomplete contracting perspective, covenants allocate control rights to the party who has incentives to make better decisions (take efficient action in certain states) without explicitly specifying actions to be taken or not.

An important question is how these two perspectives correspond to the empirical
evidence on how covenants are written and used. In practice, debt contracts have elements that reconcile with both perspectives. Most provisions in public debt contracts (indenture agreements) largely conform to the predictions of agency theory. These covenants, sometimes referred to as negative and affirmative covenants, specify actions to be taken or not to be taken in certain conditions and often define these restrictions in terms of accounting numbers (e.g., Smith and Warner, 1979). For example, a contract can specify the maximum level of investments, debt issuance, or dividend payouts as a function of accounting numbers, such as net worth or profitability. The effectiveness of negative covenants as a bonding mechanism thus directly depends on accounting information.

Covenants in public bond contracts are infrequently breached and renegotiated outside of bankruptcy or financial distress and hence resemble ways to bond against anticipated opportunistic actions. For example, Healy and Palepu (1990) provide evidence consistent with covenants serving as a bonding mechanism against manager/shareholder opportunism. They demonstrate that as borrowers approach the threshold in dividend payment covenants, they, in fact, reduce the level of dividend payouts, thus preventing asset substitution and claim dilution.

In contrast to public debt contracts, the vast majority of private debts contracts, as evidenced from syndicated loan contracts, also include various “maintenance covenants,” often also referred to as financial covenants (e.g., Dichev and Skinner, 2002, and Bradley and Roberts, 2004). These covenants differ from the covenants typically observed in public debt contracts, which directly restrict certain actions by the borrower. Instead, financial covenants require a borrower to adhere to a predetermined level of accounting performance. If a performance threshold is breached, lenders obtain the right to recall the loan. Such covenants are more in line with the incomplete contracting perspective.
Consider, for example, a covenant that requires the borrower to maintain a certain level of interest coverage ratio (the ratio of income/cash flow to interest expense) — one of the most common covenants in private debt contracts. While restrictions on the interest coverage ratio limit the ability of managers to take on excessive amounts of debt, there are arguably more direct ways to restrict excessive borrowing. For example, the contract could impose explicit restrictions on borrowing whenever debt levels exceed a certain threshold. Such restrictions can go into effect if accounting ratios such as leverage or interest coverage cross certain thresholds. In the agency framework it is not clear why an accounting signal (that is merely correlated with the anticipated action, e.g., issuing debt, that contracting parties are trying to restrict) would be used to pass control to lenders instead of directly restricting the action. More broadly, it is also not clear that the requirement to maintain the interest coverage ratio at a certain level aligns incentives of the borrower with those of lenders.9

The incomplete contracting perspective provides an intuitive explanation for the use of financial covenants in debt agreements. Under this perspective, financial covenants determine the allocation of control rights throughout the contractual relationship and thus facilitate the decision making process. In the example of the interest coverage ratio above, the borrower retains control as long as performance exceeds the covenant threshold specified in the contract, whereas lenders are allocated control rights when the threshold is breached. The future course of action is thus in part determined via the renegotiation process following covenant violation. Presuming that the interest coverage ratio is correlated with the underlying state of the world, this ratio represents a contractible signal on which state-contingent control allocation is based.

Leaving the decision with respect to actions to be taken for renegotiations once

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9 Other maintenance covenants, such as covenants that restrict leverage, are easier to explain in an agency framework. In addition to restricting debt issuing directly, restrictions on leverage also create disincentives for opportunistic actions because they force shareholders to keep a certain amount of capital in the firm.
uncertainty is resolved, rather than specifying the action in the original contract, is also consistent with the primary premise of incomplete contract theory, namely, that contracts are unable to specify actions to be taken in all future states because the world is too uncertain for the contract to anticipate all eventualities. Rather than specifying the action, financial covenants ensure that lenders have a stronger bargaining position in states in which the borrower is likely to have incentives for opportunistic actions (e.g., during periods of poor performance). Lenders can use the right to recall the loan to exert influence over impending decisions, such as to continue or discontinue the project or any other operational action. It is through such contingent control rights allocations that accounting enhances debt contract efficiency under the incomplete contracting perspective. The accounting system provides contractible, albeit imperfect, signals of the state of the world on which the state-contingent allocation of control rights can be based.

It is important to reiterate that both the agency and incomplete contract theories overlap as they view covenants as a device for addressing conflicting interests between the borrower and lender. However, in addition to its ability to explain the prevalent use of financial covenants, incomplete contract theory is also a compelling perspective for explaining two commonly observed aspects in debt contracting: renegotiations and the active role lenders play in a borrower’s corporate governance as we discuss in Section 2. We review the empirical evidence on these two aspects next. We narrow our focus here, primarily, to the empirical evidence on private debt contracting practices, since these are more closely linked to incomplete contract theory due to their extensive use of financial covenants.

3.2. The role of renegotiations

The incomplete contract perspective predicts and emphasizes the occurrence of contract renegotiations. Renegotiations are triggered by the incomplete nature of debt contacts. For
example, the arrival of new information can create an opportunity for an efficiency gain, i.e., a Pareto improvement, that can be realized by modifying the original contract. Such an efficiency gain is split between the contracting parties according to their bargaining power during the renegotiation process.

Empirical evidence supports the importance of contract renegotiation in debt contracting. Roberts and Sufi (2009c) demonstrate that loan renegotiations are very common in practice, consistent with the implications of the incomplete contract theory. They find that more than 90% of long-term loans are renegotiated before maturity. Debt contract renegotiations are often triggered by the arrival of new information about the borrower or changes in macroeconomic conditions (Roberts and Sufi, 2009c, Roberts 2015). Renegotiations of debt contracts are also important information events as they transmit information about the borrower to capital markets (Nikolaev 2015).

In line with control allocation view, accounting-based covenants are often set tightly relative to a firm’s underlying performance measures and lenders use them as "tripwires" (Smith 1993, Dichev and Skinner, 2002). Consequently, these covenants are frequently violated, leading to contract renegotiations, but the violations are typically not associated with bankruptcy or financial distress (Dichev and Skinner, 2002, Chava and Roberts, 2008, Roberts and Sufi, 2009a and 2009c, and Denis and Wang, 2014). More extensive use of accounting-based covenants predicts more frequent renegotiations in the future (Christensen and Nikolaev 2012, Nikolaev 2015), which is consistent with the incomplete contracting view that covenants play efficiency role when used in conjunction with future renegotiations (e.g., Huberman and Kahn, 1988, Berlin and Mester 1992).
The significance of contract renegotiations within the incomplete contracting framework also highlights that financial covenants may have another important role. In addition to being a mechanism for the state-contingent allocation of control rights, these covenants also influence the bargaining position of contracting parties in ex post renegotiations (e.g., Aghion, Dewatripont, and Rey 1994). Roberts and Sufi (2009c) provide empirical evidence in support of this view. They show that for a deviation in a given accounting performance measure, the outcome of contract renegotiation is more favorable to the lenders when the contract contains a financial covenant based on this measure. They interpret this evidence as consistent with covenants shaping the renegotiation process. The authors also highlight the importance of another contract design feature — performance pricing provisions — in the allocation of bargaining power. Performance pricing is a frequently used provision that links a loan’s interest rate to a measure of the borrower’s performance in an inverse manner, with the interest spread increasing (decreasing) with performance deterioration (improvement) (Asquith et al., 2005). Roberts and Sufi show that the presence of a performance pricing grid based on a borrower’s accounting performance measure amplifies the effect of an adverse change in this measure on the renegotiation outcome. Specifically, the presence of a provision based on the debt-to-profitability ratio incentivizes the borrower to renegotiate with lenders following deterioration in this measure, to the extent that such deterioration results in a sharp increase in the interest rate specified by the performance grid.

3.3. The governance role of lenders

Another important distinction between the agency and incomplete contract perspectives is that the latter signifies the role that lenders play in the borrower’s governance. Within the
incomplete contract perspective, contracts are designed to actively involve lenders in the borrower’s decision making process in some states of the world.

Several studies examine lenders’ role in corporate governance. Chava and Roberts (2008) provide evidence that violations of accounting-based covenants lead to a significant decline in investment activity consistent with creditors intervening to thwart inefficient investment. Roberts and Sufi (2009a) and Sufi (2009a) respectively show that following financial covenant violations, firms experience a sharp and persistent decline in net debt issuance activity and a significant decline in bank line-of-credit availability. Nini, Smith, and Sufi (2012) supplement this evidence by demonstrating that covenant violations also cause a sharp reduction in leverage and shareholder payouts, as well as an increase in CEO turnover. In line with these operational and governance changes, firms violating covenants also experience a higher cost of debt financing (Beneish and Press, 1993, 1995, Sweeney, 1994, and Nini, Smith, and Sufi, 2009).

This literature on covenant violations demonstrates that accounting-based covenants are central to creditors’ obtaining control rights and that lenders play an active role in the governance of borrowers outside of payment default and bankruptcy (Baird and Rasmussen, 2006, and Roberts and Sufi, 2009a).

3.4. The contracting value of accounting information

Having discussed the key predictions from the agency and incomplete contracting perspectives with respect to the use of covenants and other accounting-based contractual provisions, as well as the relevant empirical evidence, we next focus more closely on empirical evidence concerning how the properties of accounting numbers influence the design and efficiency of these provisions.

The properties of accounting information affect contract efficiency in both the agency
and incomplete contract frameworks, but the mechanisms have important distinctions as discussed in Section 2.3. From the agency perspective, the relative efficiency of accounting numbers stems from their ability to enhance covenants’ effectiveness in curbing opportunistic behavior through incentives or direct restrictions. As discussed by Leftwich (1983, p. 27): “Just as it is in the interest of stockholders to negotiate restrictions on a firm’s financing and investment decisions, it is also in their interest to negotiate accounting measurement rules that reduce management’s ability to circumvent the restrictions by a judicious choice of accounting methods.” In other words, since managers have incentives to bond against opportunistic behavior through covenants, they have incentives to select accounting procedures that enhance the efficacy of this bonding mechanism (e.g., managers may commit to higher accounting reporting quality).10

From the incomplete contract perspective, the quality of the accounting signal is determined by its ability to allocate control to the party with value maximizing objectives, which is primarily determined by the strength of its association with the underlying state of the borrower. Indeed, Aghion and Bolton (1992, p. 477) interpret the association between the (accounting) signal and the state as “the degree of incompleteness of the ex-ante contract”. In the extreme, if the accounting signal is perfectly associated with the underlying state, contracting parties could, in effect, contract directly on the state of the world (i.e., the contract would no longer be incomplete). In other words, the accounting signal allows a state-contingent allocation of control rights between the borrower and its lenders as long as the signal is sufficiently strongly correlated with the underlying state of the firm. Building on this premise, because a higher quality accounting signal should more precisely reflect the state, higher “accounting quality” is

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10 See Watts and Zimmerman (1990) and Watts (2003) for a more complete argument on the beneficial effects of the properties of accounting numbers within the agency theory framework.
expected to enhance the efficiency of financial covenants as the state-contingent control mechanism. That said, a conceptually different mechanism through which efficiency is achieved does not necessarily imply that the two contracting perspectives predict that different accounting rules or properties of accounting information are desirable. For example, both perspectives emphasize the importance of verifiability and absence of manipulations of accounting information.

There is ample empirical evidence that the properties of accounting numbers are associated with debt contracting practices and market outcomes such as liquidity (e.g., Ball, Bushman, and Vasvari, 2008, Beatty, Weber, and Yu, 2008, Wittenberg-Moerman, 2008, Zhang, 2008, and Christensen and Nikolaev, 2012). Authors of empirical studies have generally interpreted the association between accounting quality on contracting practices primarily from the agency perspective. For example, Ahmed, Billings, Morton, and Stanford-Harris (2002) and Nikolaev (2010) provide evidence consistent with more conservative financial reporting enhancing the efficiency of negative covenants in bond indentures by mitigating bondholder-shareholder conflicts of interest. In addition, empirical studies often test the hypothesis that high quality financial reporting reduces borrower opacity and consequently mitigates agency costs (Watts, 2003). In support of this hypothesis, researchers have found that high financial reporting quality is associated with a lower interest spread, longer maturity (e.g., Francis et al., 2005, and Bharath et al., 2008), a more dispersed syndicate structure (Ball et al., 2008), and lower bid-ask spreads in secondary loan trading (Wittenberg-Moerman, 2008).

Although much of the existing empirical evidence is interpreted in the agency perspective, it is often also consistent with the incomplete contracting perspective. Zhang (2008) emphasizes that conservative financial reporting facilitates a more timely transfer of control
rights to lenders via financial covenants when borrowers perform poorly, which results in a lower interest spread. A number of studies also find associations between the quality of accounting signals and the use of contract provisions that allocate control rights contingent on the state of the borrower. Utilizing material internal control weaknesses (ICW) to measure accounting quality, Costello and Wittenberg-Moerman (2011) find that following ICWs, financial covenants are used less extensively in loan agreements. They also find a strong association between financial reporting quality and the use of performance pricing provisions: following ICWs, credit-rating-based performance pricing provisions substitute for accounting-ratio-based provisions, in line with the reduced efficiency of provisions based on accounting signals when such signals are of lower quality.

The evidence in Costello and Wittenberg-Moerman (2011) is consistent with Ball, Bushman, and Vasvari (2008), who show that when a loan includes a performance pricing provision, the likelihood that a provision is based on an accounting ratio increases in the debt contracting value (DCV) of accounting information (DCV is measured by the strength of accounting numbers in predicting future credit ratings downgrades). Also utilizing variations of the DCV measure to estimate the quality of the accounting signal, Christensen and Nikolaev (2012) show how different types of financial covenants are utilized in private loan agreements. Specifically, they show that performance (income-statement-based) financial covenants are used more extensively than capital (balance-sheet-based) covenants when the quality of the accounting signal is higher, in line with the former type of covenants being more tightly linked to the underlying state of the borrower. Dou (2014) relates accounting quality to contract renegotiations and finds that higher values of the DCV measure reduce the frequency with which accounting-based provisions are renegotiated, consistent with higher accounting quality.
enhancing the correlation between the accounting signal and the underlying state of the borrower, and thus making loan contracts “more complete”.

Empirical studies also demonstrate that GAAP numbers are modified substantially for debt contracting purposes. For example, Demerjian and Owens (2015), in a sample of 592 fixed charge covenants, document 356 different definitions. From an incomplete contract perspective, these adjustments can be interpreted as enhancing the accounting signal so that it more precisely reflects the state and, in turn, allows for the more efficient allocation of control rights and bargaining power via financial covenants and other accounting-based contingencies. Li (2010) examines contractual definitions of accounting numbers used in syndicated loan contracts and finds that transitory components of earnings (e.g., earnings from discontinued operations) are typically eliminated from GAAP earnings. The author relates this evidence to the incomplete nature of debt contracts and suggests that because the transitory components of earnings are less informative about the state, they are excluded from the measurement of the accounting signal. Shedding more light on the usefulness of different accounting earnings components for debt contracting, Li (2014) shows that working capital accruals are generally included in the measurement of earnings, but long-term accruals, such as depreciation and amortization expenses, are often excluded. Frankel, Seethamraju, and Zach (2008) and Beatty, Cheng, and Zach (2011) supplement this evidence and show that loan contracts include adjustments for goodwill valuation.\(^1\) Although not directly examining how accounting signals are measured in debt contracts, Demerjian (2011) reinforces the importance of measurement issues. Demerjian

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\(^1\) Frankel et al.’s (2008) finding that debt contracts often include goodwill adjustments in the determination of covenant compliance is interesting and surprising because other prior research finds that goodwill adjustments are excluded for contracting purposes (Leftwich 1983). The finding that covenant definitions do not always exclude discretionary and hard to measure accruals is, however, consistent with evidence in Demerjian, Donovan and Larson (2015) that find that covenants do not always exclude fair value adjustments under SFAS 159, even when borrowers use the fair value option.
(2011) shows that the use of balance-sheet-based covenants has declined following standard setters’ shift towards an emphasis on the valuation of assets and liabilities, such as the broader adoption of fair value accounting.

3.5. Summary

Both the agency and incomplete contracting perspectives are descriptive of contracting practices that we observe empirically. Indeed, with respect to some issues such as how the contracting value of accounting information affects debt contract design, the two perspectives may lead to similar predictions. At the same time, compared to the agency framework, incomplete contract theory has focused more on several commonly observed debt contracting practices. In particular, in our view, incomplete contract theory offers a more persuasive efficiency role for certain financial covenants in private debt contracts and also pays more attention to the importance of renegotiations and the role that lenders play in the governance of borrowers. We, therefore, expect the incomplete contacting framework to motivate more empirical studies on how accounting information affects and shapes these commonly observed contracting practices.

4. Open questions and future directions

Despite much interest in understanding the contracting role of accounting information since the development of positive accounting theory starting with Watts and Zimmerman (1978), many important questions about the role of accounting information in debt contracting are not entirely understood. For example, why do many contracts include only a few accounting-based covenants when the cost of adding extra covenants seems low? Can we differentiate between the channels through which covenants facilitate contracting? Should accounting rules be designed to enhance the contracting role of accounting-based covenants? What is the role for accounting
regulation and standard setting in the context of private contracting? Finally, how large are the efficiency gains generated by the reliance on accounting-based covenants? In this section, we discuss recent attempts to answer these questions and how incomplete contract theory may help accounting research make more progress in addressing these questions.

4.1. Why do contracts only include a few accounting-based covenants?

Skinner (2011) emphasizes that while rating agencies utilize an extensive number of accounting ratios to evaluate a firm’s creditworthiness, debt contracts include only a relatively small number of accounting-based covenants. Of course, an additional accounting-based covenant is not costless; there are the costs of monitoring compliance with the covenant and further restrictions on managers’ flexibility. The incremental costs, however, seem to be relatively low. Thus, the benefits of including an extra covenant based on an additional accounting signal in terms of achieving a more efficient control-rights allocation may well exceed these costs.¹² Although it’s possible that the costs of negotiating, monitoring, and enforcing accounting-based covenants are higher than the literature typically presumes (Skinner, 2011), it remains unclear why contracts leave out easy-to-include provisions and contingencies.

One potential reason why these contingencies are left out of the contract is that adding multiple contingencies comes with another type of cost – the difficulty of carrying out fair and efficient renegotiations in the future. This explanation for contract “simplicity” has received attention in recent work by Hart and Moore (2008), Hart (2009), and Halonen-Akatwijuka and Hart (2013). The key innovation in these studies is that they deviate from the common assumption that ex post renegotiation is efficient, as predicted by the Coase theorem (Coase, 1960). Intuitively, given that contracts are incomplete, contracting parties may naturally disagree

¹² This extra covenant may be based on a signal that complements the signals in other financial-based covenants to better capture the underlying state of the firm.
about the relevance of contractual provisions that should apply in unforeseen future states and consequent renegotiations.

More specifically, Halonen-Akatwijuka and Hart (2013) argue that what is written in the contract determines what the contracting parties believe they are entitled to. Hence, a problem can arise if provisions in the initial contract create different “reference points” and contracting parties disagree about which is the most applicable when an unanticipated state of the world occurs. In these circumstances, one party may choose a provision applicable to one contractible eventuality to be the reference point for renegotiation, while the other party may choose another provision applicable to some other contractible eventuality. As a result, having multiple provisions can complicate the renegotiation process in states of the world that are not explicitly covered by the contract (an issue that may be more severe in syndicated loans with multiple lenders). Further, when the contracting parties are not in agreement about the reference point for the renegotiation and, consequently, about the outcome of the renegotiation, they may become aggrieved and reduce their effort. This leads to ex post and, consequently, ex ante inefficiency. To prevent this inefficiency, the contracting parties can deliberately write a relatively simple contract with few contingencies.

While this theory has yet to be tested empirically in the debt contracting setting, where the contracting parties are typically sophisticated, the general intuition seems applicable. For example, imagine a situation where only one of two financial covenants is violated. Which

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13 Halonen-Akatwijuka and Hart (2013) provide a very intuitive example of how, by serving as reference points, multiple contingencies may complicate the renegotiation process under the unforeseen circumstances. Imagine a simple employment contract for a nanny, which states that on a weekday the nanny’s hourly wage is $15 from 9am to 5pm and $30 if parents are late and the nanny leaves after 5pm. But what happens if parents want to employ the nanny one weekend? The nanny may feel entitled to $30 wage, while parents may feel that $15 rate is the right reference point. In these circumstances, not including an after-hours rate in the original contract could have made negotiating the weekend rate easier for the contracting parties. In other words, having a provision for an after-hours rate reduces uncertainty in the states where the parents are late from work, but may hinder (re)negotiation in other states.
covenant should be more important when the renegotiation takes place? The borrower might have an expectation that lenders will waive such a violation or impose a trivial penalty because the other covenant is not breached, whereas lenders may feel entitled to a significant concession (e.g., tightening of the covenants and/or receiving a renegotiation fee). More research is needed to understand whether a covenant package’s simplicity could be the endogenous result of incompleteness aimed at simplifying future renegotiations.

4.2. What are the channels through which covenants facilitate contracting?

While covenant packages are relatively simple, we do observe considerable heterogeneity in their design. What explains the differences in the choice of accounting signals and how thresholds are set based on these signals is still not well understood. One possibility is that these choices are determined based on the signal-to-noise ratio associated with different accounting indicators. In other words, conditioning a covenant on the least noisy indicator of how well a borrower is performing, which is likely to differ across firms, is a plausible explanation (e.g., Ball, Bushman, and Vasvari 2008, Costello and Wittenberg-Moerman, 2011, and Demerjian 2011).

Another possibility, however, is that different covenants represent different channels through which accounting facilitate contracting. If this is the case, it would be interesting to understand what these channels are. For example, can we distinguish the effect of covenants designed to incentivize management ex ante from those designed to reduce the agency costs of debt by limiting opportunistic behavior ex post? More importantly, there is still very little empirical evidence that can help us distinguish between the role of accounting information in facilitating bonding mechanisms against anticipated suboptimal actions by shareholders/managers and its role in determining the allocation of control rights. However,
several recent studies take steps toward better understanding differences in how debt covenants are designed (e.g., Christensen and Nikolaev, 2012, Dyreng, Vashishtha, and Weber, 2014, Li, Vasvari, Wittenberg-Moerman, 2014, and Hollander and Verriest, 2015).

Christensen and Nikolaev (2012) argue that capital covenants and performance covenants encountered in private debt contracts play conceptually different roles (see also Dyreng, Vashishtha, and Weber, 2014, and Hollander and Verriest, 2015). Recall that Aghion and Bolton (1992) argue that when contracts are incomplete, contracting parties with divergent interests may try to design a contract that aligns their incentives ex ante, in which case there would be no need to reallocate control rights ex post. Alternatively, because the ex ante alignment of incentives is not always feasible due wealth constraints of the borrower, covenants can address the conflict of interest ex post by transferring control to the party with value maximizing incentives. Following this line of reasoning, Christensen and Nikolaev hypothesize that capital covenants align the incentives of the contracting parties ex ante by limiting the amount of the borrower’s debt, whereas performance covenants serve primarily as “tripwires” that transfer control rights ex post. The evidence in Christensen and Nikolaev (2012), Dyreng at la. (2014), and Hollander and Verriest (2015) is broadly consistent with these hypotheses.

Li, Vasvari, and Wittenberg-Moerman (2014) analyze another potentially important efficiency channel – the dynamic allocation of control rights over the life of the loan. Specifically, they study accounting-based covenants with threshold values that become more restrictive over the life of the loan. This covenant structure relaxes covenant thresholds following loan initiation, providing borrowers with a grace period over which they are more likely to retain control rights, but with control rights shifting to lenders if borrowers cannot meet increasingly demanding covenant thresholds over the remaining life of the loan. The authors show that the
dynamic allocation of control rights can be used to overcome the problem of (temporary) borrower underperformance following loan initiation (i.e., despite poor performance, it is more efficient to leave the control rights with the borrower).

Although these studies have made some progress in understanding how accounting-based covenants enhance debt contract efficiency, more work is needed to better understand the channels through which accounting information may be useful in facilitating contracting. In particular, we expect debt contract efficiency to be influenced by different combinations of accounting-based provisions. For example, how do financial covenants and accounting-ratio-based performance pricing provisions complement each other in assigning control rights among contracting parties (e.g., Li et al., 2014)? Is bargaining power affected when some financial covenants in the contract have relatively little slack at loan initiation, while others include covenant thresholds that become more restrictive over the life of the loan? We expect incomplete contract theory to be a useful framework for answering these and other related questions.

4.3. How should accounting rules be designed?

How can accounting rules be designed to enhance the role of accounting in determining control allocation? The incomplete contracting framework, which has been used to explain the optimal design of securities, may also be applicable to exploring the optimal design of accounting rules and can potentially generate rich testable predictions. A recent study by Gao (2013) takes advantage of the incomplete contract framework to explicitly separate accounting rules from reported performance properties. The basic idea is that conservative accounting rules may lead to neutral reporting if the conservatism in the rules offsets managerial opportunism. Gao (2013) models this idea as a two-step representation of the mapping between the economic substance of a transaction and accounting earnings: (i) the non-contractible economic state is
mapped in a manipulable transaction characteristic, and (ii) an accounting rule maps the
transaction characteristic into a contractible accounting report. Gao (2013) finds that having
conservative rules is optimal when incentives to overstate performance are present and hence
that conservative accounting rules serve as a potential mechanism to obtain a neutral accounting
report.

General insight from the incomplete contract theory may also be applicable to the design
of accounting rules more broadly. In particular, accounting rules can be viewed as part of the
control allocation mechanism. For example, when the manager has incentives to deliver an
informative measure of the economic performance, control over the choice among different
accounting methods may be allocated to the management. In contrast, when incentives for
manipulation are present, lenders should have the right to request additional evidence and verify
the credibility of the financial report. Overall, in line with accounting information being an
integral part of the contracting process (Watts and Zimmerman, 1986), both theoretical and
empirical studies that address the design of accounting rules as a part of a (bigger) security
design problem would be insightful with respect to accounting rules’ efficiency implications.

4.4. What is the role for accounting standards in private debt contracting?

One of the central questions in accounting is whether there is an efficiency role for
accounting regulation and standards from a contracting perspective. Kothari, Ramanna, and
Skinner (2010) explicitly discuss arguments for and against regulation in accounting. As they
point out, an important consideration in the debate on accounting standard setting is whether
certain attributes of financial reporting, such as reliability, verifiability, and conservatism, should
be included in general purpose financial statements or whether information from these statements
should be adjusted by contracting parties for their specific needs. We add to this discussion by highlighting incomplete contracting theory’s potential for providing insight into this topic.

The most common efficiency argument for using GAAP to formulate covenants and other accounting-based provisions is that it would be costly to negotiate an entire set of accounting rules and procedures for every debt contract (Leftwich, 1983, p. 28, Kothari, Ramanna, and Skinner, 2010). This view actually employs the incomplete contracting perspective in the sense that using GAAP as a starting point is a low cost alternative to writing a complete contract, even if not all parts of GAAP reflect the preferences of the private parties negotiating the contract. While this “duplication cost” argument is important in explaining why it is useful to reference GAAP in the contract, it does not answer the question of what makes one set of GAAP rules more efficient than another set (assuming there are viable alternatives) and, more importantly, whether there is a need for a regulator to choose between the sets. In other words, while debt contracting may demand certain properties of information, e.g., conservatism, it is not clear whether conservatism should be a part of GAAP or a part of the privately negotiated contract terms? Specifically, because contracting parties could make conservative adjustments to GAAP numbers when privately negotiating credit agreements and because such adjustments appear to entail negligible costs (Leftwich, 1983, Dichev and Skinner, 2002, and Li, 2014), the role of accounting regulators and standards setters in debt contracting becomes unclear.

While this question has been debated in the accounting literature (e.g., Beatty, Weber, and Yu, 2008) and still remains unsettled conceptually, the incomplete contracting perspective offers a potential role for accounting standard setters (Christensen and Nikolaev, 2014). In particular, the accounting measurement rules used in debt contracts are inherently incomplete with respect to future transactions for which no accounting treatment is established at the time of
contract initiation. Transactions, such as new ways to shift liabilities off the balance sheet, make it difficult to settle the contract in the future and create scope for opportunistic behavior. One way to resolve such incompleteness in measurement rules is to use GAAP as a starting point at contract initiation and allow for GAAP changes that are mandated over a contract’s duration. As long as standard setters advance GAAP in response to new developments, changes in GAAP over the duration of the loan will assist in limiting opportunistic behavior due to contingencies unforeseen at contract initiation.

4.5. How large are the efficiency gains from using accounting-based covenants?

The evidence that accounting has an efficiency role in contracting is rather convincing. At the same time, although the magnitude of contracting frictions determines accounting’s economic consequences (Holthausen and Leftwich, 1983), we have almost no evidence regarding the economic magnitude of the efficiency gains.

For example, can we quantify the effect of accounting-based covenants on the access to financing profitable investments? Although there is no simple way of answering this question, we believe that doing so will require a greater integration of theoretical structure and empirical evidence. One particularly promising direction, albeit one that is not without its limitations, is to employ structural estimation techniques. For example, by examining revolving lines of credit, Matvos (2013) uses a relatively simple model to capture the important trade-offs a firm faces when it chooses to rely on accounting-based covenants. Matvos (2013) views the inclusion of additional covenants as a way of making a contract more complete and estimates the incremental gain from using an additional covenant. Interestingly, his findings indicate that the benefits from adding an extra covenant are relatively low. Researchers could extend Matvos’ (2013) approach
to explicitly incorporate different efficiency channels as well as examine the effect of the various properties of accounting numbers on efficiency gains.

5. Conclusion

The ability of accounting information to facilitate financing transactions between borrowers and lenders has long been a central question in accounting research. The most commonly used theoretical reasoning for why accounting has economic implications for debt contracting is agency theory, which recognizes the importance of accounting-based provisions in resolving incentive conflicts between shareholders (managers) and debtholders. Under the agency perspective, these provisions limit value-reducing actions by the borrower. Although insights from agency theory are very important and have motivated empirical research that has documented persuasive evidence in support of the general notion that accounting information improves contract efficiency, the mechanisms through which that efficiency is achieved in practice remain largely an open question.

To provide insight into this issue, this survey focuses on incomplete contract theory. Under this theoretical perspective, the primary role of accounting-based provisions is not to restrict specific actions by the borrower, but to allocate control rights and bargaining power to the contracting party that has incentives to make value-maximizing decisions in future states of the world. This theory thus suggests that accounting information enhances debt contract efficiency by providing reliable signals of a borrower’s economic condition on which state-contingent control allocation is based. Incomplete contract theory provides compelling explanations for important empirical regularities in debt contracting, particularly in the private debt setting.
By providing rich theoretical predictions, we expect the incomplete contacting framework to motivate additional empirical studies and further advance our understanding of the significance of the contracting value of accounting information. We suggest a number of directions that accounting research in debt contracting may take to achieve this goal.
References


