

Property Rights and Corporate Finance

Richard A. Graff (rgraff@electrum.us) and
Joseph P. Kairys, Jr. (joseph.kairys@economics.gu.se)

Working Papers in Economics no. 174
August 2005
Department of Economics
Göteborg University

Abstract: We examine a central result in corporate finance – the Modigliani-Miller capital structure irrelevance proposition – from a Coasian property rights perspective. Building upon the work of Coase, Demsetz and Cheung, we develop an enabling methodology to study the impact of positive Coasian transaction costs. When the Modigliani-Miller assumption of default-free debt is relaxed in the analysis of corporate leverage, either long-lived transaction costs related to property rights must be explicitly assumed away, or long-lived transaction costs related to property rights must be incorporated into the analysis.

Keywords: property rights; transaction costs; capital structure

JEL-Codes: D23; G32

Property Rights and Corporate Finance

Richard A. Graff

Electrum Partners L.L.C.
Chicago, IL

rgraff@electrum.us

and

Joseph P. Kairys, Jr.

Visiting Researcher
School of Business, Economics and Law
Göteborg University
Göteborg, Sweden

joseph.kairys@economics.gu.se
jkairys@gsb.uchicago.edu

Property Rights and Corporate Finance

Abstract

We examine a central result in corporate finance – the Modigliani-Miller capital structure irrelevance proposition – from a Coasian property rights perspective. Building upon the work of Coase, Demsetz and Cheung, we develop an enabling methodology to study the impact of positive Coasian transaction costs. When the Modigliani-Miller assumption of default-free debt is relaxed in the analysis of corporate leverage, either long-lived transaction costs related to property rights must be explicitly assumed away, or long-lived transaction costs related to property rights must be incorporated into the analysis.

Property Rights and Corporate Finance

The issuance of corporate securities assigns property rights to the earnings and assets of firms, yet the work of Coase on both the nature of firms and the economic role of property rights is rarely cited in the corporate finance literature.¹ As an indication of the extent to which the corporate finance and property rights literatures have developed independently, thirty years after Modigliani and Miller published their paradigm-shifting study of the leverage decision of firms (hereafter MM),² neither Modigliani nor Miller references Coase in their retrospective articles on the MM propositions.³

Nevertheless, the existence of a connection between the work of Coase and MM has not gone unnoticed by other investigators. For example, the MM capital structure irrelevance proposition has been referred to variously as “a special case of the more general proposition developed by Coase,”⁴ and “almost identical to the Coase Theorem,”⁵ although the precise nature of the connection has not been subjected to rigorous economic analysis.

In corporate finance, ambiguities in the “perfect markets” assumption of MM have been interpreted in the corporate finance literature to be resolvable only by moving

¹ Ronald H. Coase, *The Nature of the Firm*, 4 *Economica* 386 (1937); Ronald H. Coase, *The Problem of Social Cost*, 3 *J. Law Econ.* 1 (1960).

² Franco Modigliani & Merton H. Miller, *The Cost of Capital, Corporation Finance, and the Theory of Investment*, 48 *Am. Econ. Rev.* 261 (1958).

³ Franco Modigliani, *MM – Past, Present, Future*, 2 *J. Econ. Perspectives* 149 (1988); Merton H. Miller, *The Modigliani-Miller Propositions after Thirty Years*, 2 *J. Econ. Perspectives* 99 (1988).

⁴ Michael C. Jensen & Clifford W. Smith, *The Theory of Corporate Finance: A Historical Overview*, in *The Modern Theory of Corporate Finance 2* (Michael Jensen & Clifford Smith, eds., 1984), at 9.

⁵ Douglas W. Allen, *Transaction Costs*, in *Encyclopedia of Law and Economics* 893 (Boudewijn Bouckaert & Gerrit de Geest eds. 2000), at 904.

in the direction of a zero transaction cost economy.⁶ On the other hand, Coase regards the zero transaction costs world of the “infamous Coase theorem, named and formulated by George Stigler,” as merely “a stepping stone on the way to an analysis of an economy with positive transaction costs.”⁷ For Coase, the assumption of “no costs of carrying out market transactions... is, of course, a very unrealistic assumption.”⁸ The difference between these approaches exists, in part, because Coase does not provide an enabling methodology for analyzing the economic impact of transaction costs in general. The result is that economists have struggled with competing definitions and approaches.⁹

In this study we consider transaction costs from a Coasian perspective. We examine the transaction process as described by Coase,¹⁰ take into account the property rights perspective outlined by Demsetz,¹¹ and investigate the temporal dimension of transactions. We use the transaction costs paradigm of Cheung to determine which transaction costs associated with debt represent binding constraints, and which transaction costs may be safely assumed away.¹² Then we overlay our analysis of transaction costs on the assumptions of the MM model in order to illuminate the relationship between the Coasian and MM frameworks and highlight the differences.

MM assumes perfect markets, atomistic competition and default-free debt. As we show, this eliminates all transaction costs associated with securities transactions. MM also implicitly assumes positive transactions costs for transactions in physical assets. It

⁶ For a comprehensive discussion see Eugene F. Fama, The Effects of a Firm’s Investment and Financing Decisions on the Welfare of its Security Holders, 68 Am. Econ. Rev. 272 (1978).

⁷ Ronald H. Coase, The Institutional Structure of Production, 82 Am. Econ. Rev. 713 (1992), at 717. See also George J. Stigler, Two Notes on the Coase Theorem, 99 Yale Law J. 631 (1989).

⁸ Coase, The Problem of Social Cost, *supra* note 1, at 15.

⁹ Coase, *supra* note 7.

¹⁰ Coase, The Problem of Social Cost, *supra* note 1.

¹¹ Harold Demsetz, The Exchange and Enforcement of Property Rights, 7 J. Law Econ. 11 (1964); Harold Demsetz, Some Aspects of Property Rights, 9 J. Law Econ., 61-70 (1966).

¹² Steven N. S. Cheung, The Transaction Costs Paradigm, 36 Econ. Inquiry 514 (1998).

follows that the MM model world is different from the zero transaction cost world of the Coase Theorem. It also follows that the MM capital structure irrelevance proposition is a corner solution that depends critically upon the assumption that corporate debt is free of default risk.

Relaxation of the assumption of default-free debt leads to two divergent paths to the examination of corporate leverage. Either long-lived transaction costs related to property rights must be explicitly assumed away with more restrictive assumptions than made in MM, or long-lived transaction costs related to property rights must be incorporated into the analysis of corporate leverage.

The present study introduces a property-rights-based enabling methodology to examine the impact of Coasian transaction costs associated with corporate leverage. This provides a foundation for approaching corporate finance questions from a Coasian perspective in a world of positive transaction costs.

I. Transaction Costs

In “The Nature of the Firm,” Coase introduces the universally acknowledged insight that firms exist because of positive transaction costs.¹³ Therefore, the study of firms necessarily assumes a world of at least some positive transaction costs. MM implicitly adopts this assumption in the formal model of that study by assuming the existence of firms: “As a starting point, consider an economy in which *all physical assets are owned by corporations.*”¹⁴ Accordingly in this section we review three components

¹³ Coase does not use the term “transaction costs” in this early paper, referring instead to the “cost of using the price system.” Coase, *The Nature of the Firm*, *supra* note 1, at 390.

¹⁴ Italics added. Modigliani & Miller, *supra* note 2, at 265.

of transaction costs in the context of corporate securities, and in the next section we examine which costs represent material constraints on corporate leverage.¹⁵

Researchers have long struggled with competing views and interpretations of the term “transaction costs.” In “The Problem of Social Cost,” Coase addresses transaction costs in his description of the *process* of a transaction:

In order to carry out a market transaction it is necessary to discover who it is that one wishes to deal with, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on.¹⁶

In essence, Coase divides the transaction process into three phases, each with associated costs: (1) collection of prerequisite information, (2) negotiation and commitment, and (3) monitoring and recourse.¹⁷

By contrast, Demsetz focuses directly on property rights. Accordingly, he divides a transaction along the lines associated with the *functional aspects* that support property rights.¹⁸ Furbotn and Pejovich describe the work of Demsetz as placing “great emphasis

¹⁵ We choose not to treat asymmetric information as a fourth component of transaction costs because the information effect already falls under the rubric of Coasian transaction costs, although we note that Stiglitz believes asymmetric information should be used as a cornerstone of corporate theory: “At the heart of that model lies a new theory of the firm, for which the theory of asymmetric information provides the foundations. The modern theory of the firm in turn rests on three pillars, the theory of corporate finance, the theory of corporate governance, and the theory of organizational design.” Instead, we believe that property rights, the legal and institutional systems that support property rights, and the effect of positive transaction costs on the feasibility of outcomes are the basis for the theory of the firm. We treat information costs as contained within the three components of transaction costs outlined below. For example, information used in the market pricing of corporate securities is part of “exchanging” property rights. Joseph E. Stiglitz, *Information and the Change in the Paradigm in Economics*, in *Les Prix Nobel; The Nobel Prizes 2001*, 472 (Tore Frangsmyr, ed., 2002), at 508.

¹⁶ Coase, *The Problem of Social Cost*, *supra* note 1, at 15.

¹⁷ Dahlman makes essentially the same observation: “These then, represent the first approximation to a workable concept of transaction costs: search and information costs, bargaining and decision costs, and policing and enforcement costs.” Carl J. Dahlman, *The Problem of Externality*, 22 *J. Law Econ.* 141 (1979), at 148.

¹⁸ Demsetz, *The Exchange and Enforcement of Property Rights*, *supra* note 11; Demsetz, *Some Aspects of Property Rights*, *supra* note 11.

on the idea that externalities are associated with the costs of defining, exchanging, policing, or enforcing property rights.”¹⁹

We highlight a third component to transaction costs, the *temporal dimension*, which is related to how a “transaction” is defined. For example, transactions may be complex and have identifiable components, some of which are long-lived while others are short-lived. Furthermore, a short-lived transaction can be completely nested within a long-lived transaction. Each component can be studied independently in terms of both its process and the functional attributes related to property rights.

For corporate securities such as bonds and shares, long-lived property rights in a firm are created by a correspondingly long-lived component of the primary market transaction in which the securities are issued. The property rights associated with the securities and the long-lived component of the transaction terminate simultaneously with either the redemption of a bond at its final maturity or, in the case of shares, with a final liquidating dividend paid to shareholders.²⁰ On the other hand, the exchange of cash for a bond or share certificate is a short-lived transaction – whether it occurs in the primary or the secondary market – that is completed when the purchaser obtains legal possession of the security.

¹⁹ Eirik G. Furbotn & Svetozar Pejovich, Property Rights and Economic Theory: A Survey of Recent Literature, 10 J. Econ. Lit. 1137 (1972).

²⁰ We view a tender offer for common shares in a corporate takeover as the equivalent of a liquidating dividend. We also note that, in the event of bankruptcy, the property rights of the existing bondholders can be terminated prior to the final maturity date of the bonds in exchange for some combination of cash and/or new securities under the supervision of a bankruptcy court. Similarly, in the event of bankruptcy, the property rights of the existing common shareholders can be terminated under the supervision of a bankruptcy court, with or without some combination of cash and/or new securities.

In his Nobel lecture, Coase emphasizes the trading of long-lived property rights as the object of study in microeconomics.²¹ Coase also indicates that the short-lived transactions in which bonds or shares (“physical entity”) are traded take place in securities markets that approximate the “perfect markets” of economic theory, but only because of the highly developed institutional structures that support such markets.²²

To make these concepts clear, let us consider a specific example of a transaction involving corporate securities. When an institutional investor adds corporate bonds to its portfolio, it is important to recognize that the short-term trade and the long-lived bundle of property rights acquired in the trade are components of the *same* transaction. The failure to appreciate this dichotomy often leads to what Allen terms “ambiguity and animosity.”²³

Financial economists implicitly acknowledge the distinct natures of the short-lived and long-lived transaction. For example, when studying the property rights represented by corporate securities (capital structure, corporate governance, separation of ownership and control, etc.), the short-lived component of order execution is normally removed from the analysis by assuming that corporate securities trade in “perfect markets.” By contrast, when studying the trading of corporate securities (market

²¹ See Coase, *supra* note 6, at 717. “I explained in ‘The Problem of Social Cost’ that what are traded on the market are not, as is often supposed by economists, physical entities, but the rights to perform certain actions, and the rights which individuals have are established by the legal system.”

²² *Id.*, at 718. “Until quite recently, most economists seem to have been unaware of [the] relationship between the economic and legal systems except in the most general way. Stock and produce exchanges are often used by economists as examples of perfect or near-perfect competition. But these exchanges regulate in great detail the activities of traders (and this quite apart from any public regulation there may be).” For an example of such regulation, see Telser, who discusses how organized commodity exchanges reduce the policing and enforcement costs of trade execution through the use of a centralized clearing house. Lester G. Telser, *Why There Are Organized Futures Markets*, 24 *J. Law Econ.* 1 (1981).

²³ See Allen, *supra* note 5, at 912-913. “Two definitions [of transaction costs] prevail in the literature: one that defines transaction costs as only occurring when a market transaction takes place; the other defining transaction costs as occurring whenever any property right is established or requires protection. I call these the neoclassical and property rights definitions and have argued that which definition is useful depends on what question is being examined.”

microstructure), issues relating to the long-lived property rights component of corporate securities are normally excluded from the analysis.

II. Transaction Costs as Constraints

We have identified three types of transaction components that impact the transaction costs – the phases of the transaction process, the functional aspects that support property rights, and the temporal aspect. These components can be used to model the impact of leverage on capital structure in corporate finance. Cheung provides an important hint of how to proceed in this regard. In his discussion of the transaction cost paradigm, Cheung concludes:

The world being such a complicated place, we would stand little chance of interpreting its institutional arrangements if complicated tools are used. The transaction costs paradigm in which I was brought up – and here I am sure that Coase fully shares my view – has the merit that it entails only the simplest of economic tools. In fact, this paradigm contains no new theory whatsoever to speak of.

Only three fundamental propositions are present in the paradigm. First is the postulate of constrained maximization. Second is the downward sloping demand curve... Third is the notion that cost is the highest-valued option foregone.

In this tradition, the transaction costs paradigm concentrates on changes in constraints. Nothing is new in the theory, and the analytical tools are kept to the most elementary. The paradigm, however, is simple but difficult. The difficulty lies in the thorough empirical investigation required, from which we can (hopefully) garner insights on the nature and classification of transaction costs constraints in the real world.²⁴

In particular, in the case of corporate leverage, which transaction costs related to debt securities represent “constraints in the real world?”

We apply the four functional aspects that support property rights – defining, exchanging, policing, and enforcing to the three phases of the transaction process identified by Coase: (1) collection of prerequisite information, (2) negotiation and

²⁴ Cheung, *supra* note 12, at 520.

commitment, and (3) monitoring and recourse. The underlying property rights associated with bonds determine the particular costs that we identify as constraints in this case. These costs are widely noted in the literature, albeit not from a Coasian perspective.

For a firm issuing bonds, the transaction begins by gathering information (often from investment bankers) as to market conditions for bonds according to maturity, market (domestic or Eurobond, etc.), as well as to the perceived appetite of investors for bonds with various characteristics. This is the prerequisite information phase of the transaction.

Once the amount, maturity and market are selected, a distribution strategy is specified, which usually includes the negotiation of a formal underwriting agreement with an investment bank. Bond covenants as well as any liens against specific assets of the firm are negotiated,²⁵ a prospectus is prepared, and a credit rating is obtained.²⁶ This is the negotiation and commitment phase of the transaction.

With the sale of the bonds (either through or to) the underwriters, the firm creates a new bundle of long-lived property rights. The bonds are distributed to investors, and when the investors acquire legal possession of the bonds, the short-lived monitoring and

²⁵ The underwriters normally negotiate with prospective purchasers of the bonds (institutional investors) to determine what terms and conditions the investors will accept. Lehn and Poulsen emphasize the importance of the contractual terms of the bond as “U.S. courts have maintained that [bondholder-stockholder] conflicts should be resolved explicitly in bond contracts.” As an example, they cite *Katz v. Oak Industries*, in which the Delaware Court of Chancery wrote: “Arrangements among a corporation, the underwriters of its debt, the trustees under its indentures, and sometimes ultimate investors, are typically thoroughly negotiated and massively documented. The rights and obligations of the various parties are, or should be, spelled out in the documentation. The terms of the contractual relationship agreed to, and not broad concepts such as fairness, define the corporation’s duty to bondholders.” from *Katz v. Oak Industries, Inc.*, 508 A.2d 873, 879 (Del. Ch. 1986). Kenneth Lehn & Annette Poulsen, *Contractual Resolution of Bondholder-Stockholder Conflicts in Leveraged Buyouts*, 34 *J. Law Econ.* 645 (1991), at 645-646.

²⁶ A credit rating serves to reduce the search and information costs to bond purchasers by quantifying the risk of the bond according to a widely accepted set of standards.

recourse component related to the exchange of the investor's funds for the "physical entity" (the actual bond) concludes.

Next, two separate long-lived processes begin: *exchanging* (trading) the bonds in the secondary market, and *policing* and *enforcing* (monitoring and recourse) by the bond investors of their bundle of property rights in the firm. Because corporate bonds carry the risk that the firm may be unable to meet its contractual payments, there is a positive probability that the firm may seek bankruptcy protection.²⁷

In the event of bankruptcy, a third process begins.²⁸ The bankruptcy court (legal system) is responsible for overseeing the definition (*defining*) of a revised set of property rights in the firm through a selective abridgement/reduction of existing property rights. The goal of the bankruptcy process is to eliminate rights conflicts that reduce the value of property rights as the economic health of the firm deteriorates, thereby restoring the economic viability of the property rights that survive the bankruptcy process.

We address first the exchange of property rights in the form of corporate securities.²⁹ The maintenance of an orderly liquid secondary market for a firm's bonds and shares is a long-lived process that continues throughout the life of the securities. An individual secondary market trade of bonds or shares between investors is a short-lived process that includes deciding where, when and how to trade, negotiating the trade, executing the trade, and settling the trade. Upon settlement, ownership of the long-lived

²⁷ We acknowledge, but do not explicitly address, the fact that a shortfall can occur due to a lack of liquidity rather than financial distress. For simplicity, we treat bankruptcy as occurring when the face value of the liabilities exceeds the value of the assets of the firm.

²⁸ The firm can be thought of as functioning in a two-state model: independent operation and bankruptcy protection.

²⁹ We include both bonds and shares in our discussion of exchange costs because MM discusses the conditions under which both bonds and shares trade in their model.

bundle of property rights in the firm represented by the bonds or shares transfers to the new owner.

In highly developed capital markets, the costs of trading corporate securities are low and the institutional structure of the market removes virtually all default risk associated with the trade.³⁰ As these conditions come quite close to the “perfect markets” of economic theory, corporate finance theorists typically assume that the (short-lived) exchange costs of trading property rights in liquid secondary markets do not represent a material constraint and assume them away in analyses of corporate leverage.³¹

The policing and enforcing of bondholders’ long-lived property rights is necessary because corporate bonds, unlike government bonds, are risky. If a firm’s operating and financing decisions increase risk, the price of the firm’s bonds declines.³² In order to protect their property rights in the firm from expropriation or attenuation, bondholders normally demand restrictive covenants that constrain the actions that firms are allowed to undertake.³³ It is important to note that such protection of bondholder property rights must be negotiated *ex ante* and included in the bond indenture.

Under typical restrictive covenants, firms may be required to maintain certain financial ratios including a minimum level of working capital, asset sales may be

³⁰ We return to the issue of default risk in security trades at the end of this section.

³¹ For assets such as real estate that are exchanged in illiquid markets, the costs of exchange may be significant and need to be explicitly considered in the analysis.

³² Risk increases when the probability that the firm will be able to make its contractual payments to bondholders decreases. Such increased risks can be intentional as well as incidental consequences of management policy. Jensen and Meckling discuss how a firm’s investment decisions can lead to bondholder losses due to “the incentive effects associated with debt.” Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure*, 3 *J. Fin. Econ.* 305 (1976), at 334.

³³ Failure to restrict the financing or operating decisions of the firm can lead to substantial losses for bondholders. For example, Lehn and Poulsen report that “bondholders purportedly sustained \$1 billion in losses in the leveraged buyout of RJR Nabisco,” *supra* note 25, at 646.

restricted, future debt issues may be limited, dividend payments may be restricted, etc.³⁴ Bondholders also have the right to monitor the firm's ongoing compliance, and failure to comply with the agreed terms of the bond contract allows the bondholders to declare the firm in default. In the event of default, bondholders typically have the right to demand immediate repayment of the full principal amount outstanding. Furthermore, as almost all debt contracts contain cross-default clauses, default on one debt obligation of the firm usually triggers a default on all its debt obligations.

Researchers have noted these indirect costs associated with corporate leverage. For example, Jensen and Meckling model them as agency costs.³⁵ In any case, whether classified as “monitoring,” “bonding,” “contracting,” “policing,” or “enforcing,” the costs represent a real-world pricing constraint that is material to the analysis of bond transactions.

In practice, nearly all monitoring/policing is conducted by government regulators and private credit-rating institutions, so that out-of-pocket policing expenses are marginal for bond investors in comparison with prospective enforcement costs. More generally, monitoring/policing may be thought of as the information component of enforcement costs. Rather than regarding information costs separately, we choose to view information costs as bundled together with their corresponding activity. Accordingly, we will

³⁴ The stronger the protection of the bondholders' property rights, the more the firm is constrained in its ability to make operating and financing decisions in the best interests of its stockholders. Jensen and Meckling observe that “to completely protect the bondholders from the incentive effects, these provisions [covenants in the indenture provisions] would have to be incredibly detailed and cover most operating aspects of the enterprise including limitations on the riskiness of the projects undertaken.” Jensen & Meckling, *supra* note 32, at 338.

³⁵ Jensen and Meckling summarize the enforcement costs associated with debt as “the opportunity wealth loss caused by the impact of debt on the investment decisions of the firm [and] the monitoring and bonding expenditures by the bondholders and the owner-manager (i.e., the firm)”. Together with “bankruptcy and reorganization costs,” Jensen and Meckling label these combined costs “the agency costs associated with debt” when “the debt has some positive probability of default.” *id.*, at 342.

henceforth use the term “enforcement costs” to refer to all costs associated with bondholder policing and enforcement activities.

Bondholder ability to selectively enforce the property rights defined by the bond indenture ends once the firm declares or is forced into bankruptcy.³⁶ In this event, the bankruptcy court not only assumes supervision of the firm’s operating and financing decisions, but also becomes the ultimate arbiter of whether the firm can continue to operate or should liquidate.³⁷ On the other hand, bondholders can actively engage in negotiations with other creditors and equity holders in the firm to preempt the need for judicially-determined resolution of the firm’s crisis, and the court will give them every opportunity to do so. Accordingly, the bankruptcy process is time-consuming, complex, and cost-ridden.³⁸

The direct cost of bankruptcy reorganization constitutes a leakage of value from the firm. According to Weiss, such leakages average 3.1% of the book value of debt plus the market value of equity.³⁹ Payments to creditors are suspended from the moment that the firm enters bankruptcy, so that even if senior bondholders receive their full principal amount, bondholders almost always suffer an *ad valorem* loss due to the suspension of interest payments during the bankruptcy proceedings. Moreover, the bankruptcy court

³⁶ As Baird notes, “The automatic stay prevents creditors from using the powers given them in loan covenants. The power of shareholders to control the managers may be reduced as well, given the power of the bankruptcy court to enjoin meetings of shareholders. During a reorganization in which there are competing interests that are diversely held, much of the control rests with the bankruptcy judge.” Douglas G. Baird, *Revisiting Auctions in Chapter 11*, 36 J. Law Econ, 633 (1993), at 645.

³⁷ *Id.* In some cases, permitting a firm to continue to operate in bankruptcy can lead to large losses that would be avoided by prompt liquidation. The Eastern Air Lines bankruptcy is an example.

³⁸ A large literature is devoted to the examination of the bankruptcy process. See, for example, Robert J. Gertner & David Scharfstein, *A Theory of Workouts and the Effects of Reorganization Law*, 46 J. Fin. 1189 (1991); Lynne M. LoPucki & William C. Whitford, *Patterns in the Bankruptcy Reorganization of Large, Publicly Held Companies*, 78 Cornell L. Rev. 597 (1993); Stuart C. Gilson, Kose John, & Larry H. P. Lang, *Troubled Debt Restructurings: An Empirical Study of Private Reorganization of Firms in Default*, 27 J. Fin. Econ. 315 (1990)

³⁹ Lawrence A. Weiss, *Bankruptcy Resolution: Direct Costs and Violation of Priority Claims*, 27 J. Fin. Econ. 285 (1990).

may use an artificially low discount rate in pricing any new securities issued to bondholders, thereby effectively abridging the principle of absolute priority.⁴⁰

The prospective cost resulting from a firm's reorganization or liquidation in bankruptcy thus represents another material real-world constraint to be included in any analysis of corporate leverage. We use the term "assignment costs," rather than the more common term of bankruptcy costs, in order to highlight that the bankruptcy process reexamines and prunes/redefines the set of property rights that are held in the firm.⁴¹

To complete our analysis, we return to the dichotomy of short-lived and long-lived transactions to make some additional observations. In the case of secondary market bond and share trading, there also exists a short-lived analogue of combined enforcement and assignment costs that is commonly called "settlement risk." Humphrey discusses at length measures taken to reduce such risk following the 1974 failure of Bankhaus Herstatt and the 1987 stock market crash.⁴² As previously noted, the institutional structure of the secondary market removes virtually all such default risk associated with

⁴⁰ As Frierman and Viswanath discuss, the "cram down" procedure "is supposed to follow a strict priority rule. However, in practice, the outcome of cram down favors junior claimants by granting secured creditors securities with a nominal principal value equal to the adjudicated value of the firm's assets. Often a very low discount rate is used to price these securities, so that the secured creditors ultimately get less than their share under absolute priority. Consequently, the residual claimants, that is equity holders, are left with a positive value." Michael Frierman & P. V. Viswanath, *Agency Problems of Debt, Convertible Securities, and Deviations from Absolute Priority in Bankruptcy*, 37 *J. Law Econ.* 455 (1994), at 458 (footnote 11).

⁴¹ The bankruptcy process can be avoided if agreement can be reached by holders of property rights in the firm. Schwartz discusses the potential savings from voluntarily agreed-upon private workouts that create a new assignment of property rights to head off legal bankruptcy and its accompanying costs. Alan Schwartz, *Bankruptcy Workouts and Debt Contracts*, 36 *J. Law Econ.* 595 (1993).

⁴² Humphrey remarks that: "Credit risks exist for essentially two reasons. First, the transaction cost of eliminating clearing and settlement risk is usually thought by participants to be 'too high' to reduce it to 'zero.' Higher transaction costs usually mean fewer transactions, less market liquidity, and (unless this cost can be fully passed on) lower profits for the trading participants. Second, many times credit risk is recognized only when some unexpected or infrequent event occurs and the previously hidden risk is either revealed or taken more seriously by participants, who then raise their subjective probability assessment of its future occurrence and may take offsetting action. Frequent events, even if unexpected, are typically well accommodated through laws, regulatory rule making, or agreements among participants." David B. Humphrey, *Advances in Market Clearing and Settlement*, in *Brookings-Wharton Papers on Financial Services: 1998*, 115 (Robert E. Litan & Anthony M. Santomero, eds., 1998), at 119-120.

the trading of corporate securities, so that short-lived enforcement and assignment costs can also be dropped from the analysis.⁴³

Similarly, there also exists a long-lived variant of exchange costs when *all* of the property rights represented by a given class of corporate securities are exchanged. We therefore must address how corporate securities trade “in total” when an entire class of a firm’s securities is purchased.⁴⁴ The usual form for such transactions is a tender offer, where an investment bank is usually retained as an advisor, and a premium is normally offered relative to the prevailing secondary market price for the security.⁴⁵

A tender offer has both higher transaction costs and takes a longer period of time to complete (usually weeks or months) compared to a secondary market trade where the trade execution may be nearly instantaneous and final settlement occurs within a few business days. However, tender offers are atypical transactions. Accordingly, unless otherwise noted, we use exchange costs to refer to the short-lived exchange of securities in secondary markets and *not* to tender offers.

Viewing corporate leverage from the perspective of property rights we thus identify three potentially material components of positive transaction costs: exchange, enforcement, and assignment.⁴⁶ If the markets for trading corporate securities are liquid with low transaction costs, then (short-lived) exchange costs can be dropped from the

⁴³ Unless otherwise noted, we use enforcement costs and assignment costs to refer to the long-lived property rights in the firm and *not* to short-lived settlement risk.

⁴⁴ Coase reminds us that when studying property rights: “It goes almost without saying that this problem has to be looked at in total *and* at the margin.” Coase, *supra* note 1, The Problem of Social Cost, at 2.

⁴⁵ See, for example, Michael C. Jensen & Richard S. Ruback, The Market for Corporate Control: The Scientific Evidence, 11 J. Fin. Econ. 5 (1983); Jack Treynor, The Value of Control, 49 Fin. Analysts J. 6 (1993). When full ownership of a class of corporate securities is obtained, enforcement costs are normally reduced.

⁴⁶ These components are closely related to the functional attributes of property rights that Demsetz identifies: defining, exchanging, policing, and enforcing.

analysis.⁴⁷ Thus we are left with two long-lived components of positive transaction costs – enforcement costs and assignment costs – that represent Cheung’s “constraints in the real world.”

We turn next to an examination of the seminal study of corporate leverage by Franco Modigliani and Merton Miller. Our objective is to determine the rationale for the traditional treatment of transaction costs in the corporate finance literature, as well as to determine why the contributions of Coase to economics, if acknowledged at all, are restricted to the zero transaction cost environment of the Coase theorem.

III. Modigliani-Miller Theory

The central contribution of MM according to René Stulz, the former editor of *The Journal of Finance*, “is to have made arbitrage arguments the cornerstone of modern finance. The arbitrage proof of Proposition I introduced a new standard in finance, namely that any result the finance profession takes seriously must have the critical property that it cannot be undermined by clever arbitrageurs.”⁴⁸

The MM arbitrage rests upon the existence of “perfect substitutes” for the bundles of property rights represented by bonds and shares. We begin by examining the assumptions made by MM that allow corporate securities issued by one firm to be perfect substitutes for corresponding securities issued by another firm.

For shares, MM assumes “that firms can be divided into ‘equivalent return’ classes such that the return on the shares issued by any firm in any given class is

⁴⁷ The long-lived exchange costs associated with a tender offer do not apply to the analysis of exchange costs in general.

⁴⁸ René M. Stulz, Merton Miller and Modern Finance, 29 *Fin. Mgmt.* 119 (2000), at 119. MM Proposition I states that “the market value of any firm is independent of its capital structure and is given by capitalizing its expected return at the rate ρ_k appropriate to its class,” or equivalently, “the average cost of capital to any firm is completely independent of its capital structure and is equal to the capitalization rate of a pure equity stream,” Modigliani & Miller, *supra* note 2, at 268.

proportional to (and hence perfectly correlated with) the return on shares issued by any other firm in the same class... The significance of this assumption is that it permits us to classify firms into groups within which the shares of different firms are ‘homogeneous,’ that is, perfect substitutes for one another.”⁴⁹ This assumption has come to be known as the “risk-class” assumption.

MM makes a further assumption about the market for shares: “To complete this analogy with Marshallian price theory, we shall assume in the analysis to follow that the shares are traded in perfect markets under conditions of atomistic competition.”⁵⁰ In other words, transactions in shares take place in markets that are liquid without short-lived transaction costs. It follows immediately that MM has assumed away the exchange costs associated with equity.⁵¹ As we discuss below, MM has additional assumptions that deal with the Coasian enforcement and assignment costs associated with equity.

The Coasian transaction costs associated with corporate debt are zero because of the assumptions that MM makes about bonds. In particular, MM assumes:

- (1) All bonds (including any debts issued by households for the purpose of carrying shares) are assumed to yield a constant income per unit of time, and this income is regarded as certain by all traders regardless of the issuer.
- (2) Bonds, like stocks, are traded in a perfect market, where the term perfect is to be taken in its usual sense as implying that any two commodities which are perfect substitutes for each other must sell, in equilibrium, at the same price.⁵²

Bond Assumption (1) implies that, no matter how many bonds a firm decides to issue, there is no risk of default, and hence no risk of bankruptcy. It follows immediately that the impact of enforcement and assignment costs on corporate bonds is nonexistent, even

⁴⁹ Modigliani & Miller, *supra* note 2, at 266.

⁵⁰ *Id.* at 266.

⁵¹ There is no possibility of default in perfect market transactions, so short-lived enforcement and assignment costs (i.e., settlement risk) are zero. The assumption of atomistic competition removes the possibility of exchange costs in a tender offer, as any number of shares can be bought or sold at the prevailing market price.

⁵² Modigliani & Miller, *supra* note 2, at 267.

though the costs would be material if there were a positive probability of default. Bond Assumption (2) implies that exchange costs are zero for corporate bonds.⁵³ Thus Coasian transaction costs are zero for corporate bonds, even though bond issuers and investors would incur enforcement and assignment costs if default were to occur.

Bond assumption (1) has implications for corporate equity assignment costs as well as for corporate debt assignment costs. We already know that no assignment costs (i.e., bankruptcy costs) of any type can be incurred by firms that have leveraged by issuing corporate bonds, since corporate bonds have no bankruptcy risk. We also know that the risk of incurring assignment costs must be identical for all firms in each risk class, since before-interest earnings for the firms are perfectly correlated. Since every risk class contains a leveraged firm that has zero risk of incurring any assignment costs, it follows that the assignment cost risk must be zero for every firm in each risk class. In particular, there can be no risk of bankruptcy for an all-equity firm that decides to not issue bonds, even though the firm may have binding obligations in the form of accounts payable and unfunded pension liabilities on its corporate balance sheet.

The enforcement costs associated with equity are more complex. Shareholders are the residual claimants in the firm, and shareholders have voting control that includes the right to hire and fire the management of the firm. The MM assumption of atomistic competition, together with the MM assumption that investor borrowings “for the purpose of carrying shares” are default-free, effectively reduces the enforcement costs for equity to zero by making the control premium for the firm arbitrarily small.⁵⁴ This follows because, under atomistic competition, the supply curve for shares in the firm must be flat

⁵³ Although MM does not explicitly assume atomistic competition in the market for bonds, because all bonds are perfect substitutes for each other, there can be no exchange costs for bonds in a tender offer.

⁵⁴ Modigliani & Miller, *supra* note 2, at 267.

with an infinitely elastic supply up to the total number of shares outstanding at the prevailing market price. Accordingly, if the firm experiences a management-shareholder conflict, then any concerned investor can eliminate the conflict by borrowing at the risk-free rate in order to purchase enough shares to acquire voting control and replace the management. Since the borrowing can be limited to an arbitrarily short interval around annual meetings of the firm, it follows that there is no control premium associated with changing the management of the firm. Accordingly, no conflict, and hence, no agency costs, due to the separation of management and control can occur.⁵⁵

In short, MM assumes away *both* the short-lived exchange costs and the long-lived enforcement and assignment costs associated with corporate securities in order to have perfect substitutes for both bonds and shares.⁵⁶ Accordingly, the MM assumptions imply zero Coasian transaction costs for both primary and secondary transactions in corporate securities. However, as noted earlier, the fact that all physical assets are held by corporations implies that transactions costs are not zero for transactions in physical assets.⁵⁷ Thus the MM model world differs from the model world of the Coase Theorem, since all transactions costs in the latter world are zero. It follows that MM Proposition I

⁵⁵ Recognition of the conflict resulting from the separation of ownership and control dates back to Adolf A. Berle & Gardiner C. Means, *The Modern Corporation and Private Property*, 1932. See also Brian Hindley, *Separation of Ownership and Control in the Modern Corporation*, 13 *J. Law Econ.* 185 (1970); Eugene F. Fama & Michael C. Jensen, *Separation of Ownership and Control*, 26 *J. Law Econ.* 301 (1983).

⁵⁶ In the Modigliani-Miller “Reply” written one year after MM, Modigliani and Miller define perfect markets as “the absence of transaction costs.” Franco Modigliani & Merton H. Miller, *The Cost of Capital, Corporation Finance, and the Theory of Investment: Reply*, 49 *Am. Econ. Rev.* 655 (1959) at 656. However, it is clear that MM never meant “perfect markets” to encompass the broad Coasian definition of transaction costs, but rather the narrow interpretation, in which “transaction costs” refer to exchange costs without any settlement risk. Only the narrow interpretation is consistent with the use of the term “perfect markets” in Modigliani & Miller, *supra* note 2, at 266-267. It is rather the assumption that corporate debt is free of default risk that assures the elimination of both (long-lived) enforcement costs and assignment costs.

⁵⁷ Coase, *The Nature of the Firm*, *supra* note 1.

and the Coase Theorem are not related hierarchically, i.e., neither is a special case of the other; they simply are applicable in different economic environments.

Durand was the first to point out the “subtle and restrictive” economic environment created by the MM assumptions, although he does not “deny [the MM] propositions in their own properly limited theoretical context.”⁵⁸ Durand did not have the transaction costs framework of Coase available to analyze how the assumption of default-free debt impacts individual transaction cost components, but his conclusion demonstrates that he was pointing in the right direction;

MM have cut out for themselves the extremely difficult, if not impossible, task of being pure and practical at the same time. Starting with a perfect market in a perfect world, they have taken a few steps in the direction of realism; but they have not made significant progress, considering their avowed purpose of achieving an “operational definition of the cost of capital.” Their treatment of risk affords, perhaps, the clearest example. In allowing corporate earnings to fluctuate somewhat – presumably about a fairly definite central value – MM have postulated a world that is not 100 per cent riskless; but it is a remarkably safe world – being free from the risk of bond default, margin calls, foreclosures, or major disasters of any sort. In a world so safe, the effect of risk on the cost of capital, corporation finance, or the theory of investment is not apparent.⁵⁹

In short, Durand is asking about the meaning and significance of business risk in an economic environment in which corporations cannot default on their legal obligations.

Modigliani and Miller acknowledge Durand’s comments as “the kind of thoughtful and thought-provoking response we hoped we would get... He has probed carefully to find inadequacies in our treatment of perfect markets, and he has endeavored to explore the implications of certain market imperfections for the usefulness of our

⁵⁸ Durand was one of the preeminent authorities on the corporate finance paradigm supplanted by MM. David Durand, *The Cost of Capital, Corporation Finance, and the Theory of Investment: Comment*, 49 *Am. Econ. Rev.* 639 (1959), at 640.

⁵⁹ *Id.* at 653.

approach.”⁶⁰ Modigliani and Miller go on to take “strong exception” to Durand’s observations about risk:

We did, of course, assume in our first model that *bonds* were completely riskless and perhaps this is the basis of his objections. We felt, and still feel, however, that this is an entirely satisfactory first approximation because, if for no other reason, the quantitative restrictions typically imposed by lenders to reduce their risk have been remarkably successful.⁶¹

However, the mere existence of the “quantitative restrictions imposed by lenders” to which MM refers is *prima facie* evidence that lenders are very much concerned about the enforcement and assignment costs associated with debt.

MM contends that firms face an inelastic supply curve for the funds made available to them by institutional investors once a certain level of corporate debt has been reached:

The difficulty of borrowing more, therefore, tends to show up in the usual case not so much in the form of higher rates as in the form of increasingly stringent restrictions imposed on the company’s management and finances by the creditors; and ultimately in a complete inability to obtain new borrowed funds, at least from the institutional investors who normally set the standards in the market for bonds.⁶²

MM reiterates this point in a later paper:

And no investment can meaningfully be regarded as 100 per cent debt financed when lenders impose strict limitations on the maximum amount a firm can borrow relative to its equity (and when most firms actually plan on normally borrowing less than this external maximum so as to leave themselves with an emergency reserve of unused borrowing power).⁶³

However, MM responds to their empirical observation that institutional investors stop lending when enforcement and assignment costs become large by *eliminating the effect of*

⁶⁰ Modigliani & Miller, *supra* note 56, at 655-656.

⁶¹ *Id.* at 663 (footnote 15).

⁶² Modigliani & Miller, *supra* note 2, at 272-273 (footnote 17).

⁶³ Franco Modigliani & Merton H. Miller, Corporate Income Taxes and the Cost of Capital: A Correction, 53 Am. Econ. Rev. 433 (1963), at 441.

*enforcement and assignment costs from the MM theoretical model through the assumption that corporate debt is free of default risk.*⁶⁴

MM justifies the assumption that institutional investors ration credit by asserting that, as debt levels increase, such higher debt levels “become self-defeating by giving rise to a situation in which even normal fluctuations in earnings may force a company into bankruptcy.”⁶⁵ The MM assertion implies a credit-based limitation on the amount of leverage accessible to real-world borrowers that is inconsistent with the unlimited amount of leverage available to firms and investors in the MM model. This suggests that the MM propositions are unlikely to apply to the valuation of firms with highly leveraged capital structures, and raises the possibility of inaccurate valuations of less risky firms as well.

Stiglitz is the first to highlight the paramount importance of default-free corporate debt and default-free investor debt to the MM proof of capital structure irrelevance.⁶⁶ When the assumption of default-free debt is relaxed, the MM arbitrage breaks down as long as there are positive long-lived transaction costs associated with the enforcement and/or assignment of property rights.

IV. Modigliani-Miller Theory and Default

Viewed from the Coasian perspective of property rights and transaction costs, MM Proposition I is seen to be a result that has only been proved under very restrictive conditions: when Coasian transaction costs are zero for all securities transactions. This is not inconsistent with the Coasian environment of positive transaction costs: although

⁶⁴ The bond market explicitly *prices* the risk that MM assumes away, and for many firms, the price is substantial. Even for firms with superior credit (AAA credit rating), corporate bond yields are higher than government bond yields for every maturity along the yield curve. This implies that investors recognize and price the enforcement and assignment costs associated with corporate debt.

⁶⁵ Modigliani & Miller, *supra* note 2, at 273 (footnote 17).

⁶⁶ Joseph E. Stiglitz, A Re-Examination of the Modigliani-Miller Theorem, 59 *Am. Econ. Rev.* 784 (1969). Stiglitz then contradicts his insight with an argument asserting that default-free debt is not absolutely necessary in order for a weakened version of capital structure irrelevance to hold.

the MM assumption of perfect capital markets sets short-lived transaction costs at zero, enforcement costs and assignment costs are left indeterminate. Instead, the MM assumption that corporate and investor debt are default-free eliminates the possibility that these costs can be incurred in securities transactions.⁶⁷ Accordingly, the fundamental MM result of capital structure irrelevance is a “corner solution,” i.e., a special case that holds only when there is no possibility that corporate bonds can default.

Two approaches have been introduced in the corporate finance literature to extend MM theory to the general case in which the firm has a positive probability of default. One widely observed approach is based on weakening the MM assumption of default-free debt and compensating by strengthening the other MM assumptions so that the MM proof of capital structure irrelevance continues to hold in its original form.⁶⁸ In practice, this has meant simply setting all components of securities transaction costs at zero by assumption, including, in particular, enforcement costs and assignment costs.

The culmination of this approach is the capital structure irrelevance theorem in Fama.⁶⁹ Fama assumes that bankruptcy “involves no costs” as part of his definition of perfect capital markets, thereby removing assignment costs from his analysis.⁷⁰ Fama also assumes away enforcement costs outside of the definition of perfect markets by requiring “given investment strategies” for operating decisions and costlessly enforced “me-first rules” for financing decisions.⁷¹ Fama accordingly requires assumptions more

⁶⁷ Jensen and Meckling make a similar observation when they note that the agency costs associated with debt “incidentally, exist only when the debt has some probability of default,” *supra* note 32, at 342 (footnote 55).

⁶⁸ Myers comments: “It took some time to sort out what ‘perfect’ means in the Modigliani-Miller context. (Ezra Solomon once quipped: ‘A perfect capital market should be *defined* as one in which the MM theory holds.’)” Stewart C. Myers, *Capital Structure*, 15 *J. Econ. Perspectives* 81 (2001), at 84 (footnote 2).

⁶⁹ Fama, *supra* note 6.

⁷⁰ *Id.* at 273.

⁷¹ *Id.*

restrictive than those of the original MM study, for Miller explicitly points out that “bankruptcy costs and agency costs do indeed exist as was dutifully noted at several points in the original 1958 article [MM, *supra* note 2, see especially footnote 18 and p. 293].”⁷²

The other approach is to formally acknowledge existence of the enforcement and assignment cost components and incorporate them into the analysis of capital structure. This is the approach identified with Jensen and Meckling, who analyze capital structure as one issue within a comprehensive development of a theory of the firm.⁷³

Although promising as a concept, the Jensen and Meckling theory is built on the foundational principle of *agency cost* as the cornerstone for corporate theory rather than property rights. Accordingly, this approach to transaction costs interprets enforcement and assignment costs as arising from agency issues rather than property rights. Jensen and Meckling acknowledge the work of Coase and the theory of property rights, but they choose to emphasize contracting and the theory of agency relationships:

Since the specification of rights is generally effected through contracting (implicit as well as explicit), individual behavior in organizations, including the behavior of managers, will depend upon the nature of these contracts. We focus in this paper on the behavioral implications of the property rights specified in the contracts between the owners and managers of the firm.

Many problems associated with the inadequacy of the current theory of the firm can also be viewed as special cases of the theory of agency relationships in which there is a growing literature. This literature has developed independently of the property rights literature even though the problems with which it is concerned are similar; the approaches are in fact highly complementary to each other.⁷⁴

The problem with this interpretation is that it reduces support systems for property rights, such as the legal system, to agents acting on behalf of holders of property rights

⁷² Merton H. Miller, *Debt and Taxes*, 32 J. Fin. 261 (1977), at 262.

⁷³ Jensen & Meckling, *supra* note 32.

⁷⁴ *Id.* at 308.

rather than as impartial arbiters of property rights. In fact, we contend that *property rights* are more fundamental than agency costs, and that agency costs can be included under the general umbrella of Coase's approach to transaction costs rather than the converse.

With our shift of emphasis to a Coasian perspective of property rights and transaction costs, MM is seen to be situated at a fork in the road of corporate finance theory. One fork leads to a transaction-cost-free theory that appears to realize its potential in Fama.⁷⁵ The other fork leads to a Coasian property-rights-based theory and a world of positive transaction costs to which the present study contributes.

V. Conclusion

We examine the relationship between property rights and a central result in corporate finance, the Modigliani-Miller capital structure irrelevance proposition, using a Coasian approach to transaction costs. Contrary to a commonly held belief, MM is not a special case of the Coase Theorem. MM does not assume away *all* Coasian transaction costs, for Coase shows that firms only exist because of positive transaction costs, and MM assumes that corporations hold all physical assets. The MM model world therefore differs from the model world of the Coase Theorem, since only securities transaction costs in the MM world are zero, whereas all transactions costs in the latter world are zero. Instead, it follows that the MM world is a carefully restricted example of a world of positive transaction costs.⁷⁶

Although Coase is most commonly identified with the transaction cost environment of the Coase Theorem, Coase actually regards "the Coase theorem as a

⁷⁵ Fama, *supra* note 6.

⁷⁶ The MM model world assumes zero transactions costs for securities transactions and implicitly assumes positive transaction costs for transactions in physical assets.

[mere] stepping stone on the way to an analysis of an economy with positive transaction costs.”⁷⁷ Coase writes that “the world of zero transaction costs has often been described as a Coasian world. Nothing could be further from the truth. It is the world of modern economic theory, one which I was hoping to persuade economists to leave.”⁷⁸

The contribution of the present study is to introduce an enabling methodology to examine the Coasian transaction costs associated with corporate leverage in a world of unrestricted positive transaction costs. We identify no new costs, but we provide a framework for simplifying the analysis of costs that are already documented in the literature.

We build upon the contributions of Demsetz and Cheung to first identify those costs that are associated with the exchange of property rights, the enforcement of property rights, and the assignment of property rights in bankruptcy. We then determine that (short-lived) exchange costs may be safely assumed away, but we conclude that (long-lived) enforcement and assignment costs represent “constraints in the real world” that must be included in an analysis of corporate leverage.⁷⁹

In addition to “perfect markets” where MM explicitly assumes away exchange costs, MM also assumes that corporate debt is free of any default risk, thereby assuming away the effect of enforcement and assignment costs on bonds without assuming away the costs themselves. On the other hand, once the MM assumption of default-free debt is relaxed, enforcement and assignment costs must either be explicitly assumed away or incorporated into the analysis of corporate leverage. This illustrates the benefit a Coasian

⁷⁷ Coase, *supra* note 7, at 717.

⁷⁸ Ronald H. Coase, *The Firm, The Market, and the Law*, 1988, at 174.

⁷⁹ Cheung, *supra* note 12, at 520.

property rights framework brings to corporate finance: it illuminates the full significance of otherwise seemingly innocuous assumptions.

Coase reminds us that bonds and shares represent bundles of long-lived property rights in the firm, and his observation can serve as a starting point for broadening the definition and design of corporate securities. More generally, by focusing upon property rights as a unifying principle, we believe that new insights can be gained throughout the field of corporate finance. As Coase states in his Nobel lecture, his “contribution to economics has been to urge the inclusion in our analysis of features so obvious that, like the postman in G. K. Chesterton’s Father Brown tale, ‘The Invisible Man,’ they have tended to be overlooked.”⁸⁰

⁸⁰ Coase, *supra* note 7, at 713.

Bibliography

- Allen, Douglas W. "Transaction Costs," In *Encyclopedia of Law and Economics*, edited by Boudewijn Bouckaert and Gerrit de Geest, pp. 893-926. Cheltenham: Edward Elgar Press, 2000.
- Baird, Douglas G. "Revisiting Auctions in Chapter 11," *Journal of Law and Economics* 36 (1993): 633-653.
- Berle, Adolf A. and Means, Gardiner C. *The Modern Corporation and Private Property*. New York: Macmillan, 1932.
- Cheung, Steven N. S. "The Transaction Costs Paradigm," *Economic Inquiry* 36 (1998): 514-521.
- Coase, Ronald H. "The Nature of the Firm," *Economica* 4 (1937): 386-405.
- Coase, Ronald H. "The Problem of Social Cost," *Journal of Law and Economics* 3 (1960): 1-44.
- Coase, Ronald H. *The Firm, The Market, and the Law*. Chicago: University of Chicago Press, 1988.
- Coase, Ronald H. "The Institutional Structure of Production," *American Economic Review* 82 (1992): 713-719.
- Dahlman, Carl J. "The Problem of Externality," *Journal of Law and Economics* 22 (1979): 141-162.
- Demsetz, Harold. "The Exchange and Enforcement of Property Rights," *Journal of Law and Economics* 7 (1964): 11-26.
- Demsetz, Harold. "Some Aspects of Property Rights," *Journal of Law and Economics* 9 (1966): 61-70.
- Durand, David. "The Cost of Capital, Corporation Finance, and the Theory of Investment: Comment," *American Economic Review* 49 (1959): 639-655.
- Fama, Eugene F. "The Effects of a Firm's Investment and Financing Decisions on the Welfare of its Security Holders," *American Economic Review* 68 (1978): 272-284.
- Fama, Eugene F. and Jensen, Michael C. "Separation of Ownership and Control," *Journal of Law and Economics* 26 (1983): 301-325.

- Frierman, Michael and Viswanath, P. V. "Agency Problems of Debt, Convertible Securities, and Deviations from Absolute Priority in Bankruptcy," *Journal of Law and Economics* 37 (1994): 455-476.
- Furbotn, Eirik G. and Pejovich, Svetozar. "Property Rights and Economic Theory: A Survey of Recent Literature," *Journal of Economic Literature* 10 (1972): 1137-1162.
- Gertner, Robert J. and Scharfstein, David. "A Theory of Workouts and the Effects of Reorganization Law," *Journal of Finance* 46 (1991): 1189-1222.
- Gilson, Stuart C.; John, Kose; and Lang, Larry H. P. "Troubled Debt Restructurings: An Empirical Study of Private Reorganization of Firms in Default," *Journal of Financial Economics* 27 (1990): 315-353.
- Hindley, Brian. "Separation of Ownership and Control in the Modern Corporation," *Journal of Law and Economics* 13 (1970): 185-221.
- Humphrey, David B. "Advances in Market Clearing and Settlement," In *Brookings-Wharton Papers on Financial Services: 1998* edited by Robert E. Litan and Anthony M. Santomero, pp. 115-157. Washington, D.C.: Brookings Institution Press, 1998.
- Jensen, Michael C. and Meckling, William H. "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure," *Journal of Financial Economics* 3 (1976): 305-360.
- Jensen, Michael C. and Ruback, Richard S. "The Market for Corporate Control: The Scientific Evidence," *Journal of Financial Economics* 11 (1983): 5-50.
- Jensen, Michael C. and Smith, Clifford W. "The Theory of Corporate Finance: A Historical Overview," In *The Modern Theory of Corporate Finance*, edited by Michael C. Jensen and Clifford W. Smith, pp. 2-20. New York: McGraw-Hill, 1984.
- Lehn, Kenneth and Poulsen, Annette. "Contractual Resolution of Bondholder-Stockholder Conflicts in Leveraged Buyouts," *Journal of Law and Economics* 34 (1991): 645-673.
- LoPucki, Lynne M. and Whitford, William C. "Patterns in the Bankruptcy Reorganization of Large, Publicly Held Companies," *Cornell Law Review* 78 (1993): 597-618.
- Miller, Merton H. "Debt and Taxes," *Journal of Finance* 32 (1977): 261-275.

- Miller, Merton H. "The Modigliani-Miller Propositions after Thirty Years," *Journal of Economic Perspectives* 2 (1988) 99-120.
- Modigliani, Franco, "MM – Past, Present, Future," *Journal of Economic Perspectives* 2 (1988) 149-158.
- Modigliani, Franco, and Miller, Merton H. "The Cost of Capital, Corporation Finance, and the Theory of Investment," *American Economic Review* 48 (1958): 261-297.
- Modigliani, Franco and Miller, Merton H. "The Cost of Capital, Corporation Finance, and the Theory of Investment: Reply," *American Economic Review* 49 (1959): 655-669.
- Modigliani, Franco and Miller Merton H. "Corporate Income Taxes and the Cost of Capital: A Correction," *American Economic Review* 53 (1963): 433-443.
- Myers, Stewart C. "Capital Structure," *Journal of Economic Perspectives* 15 (2001): 81-102.
- Schwartz, Alan. "Bankruptcy Workouts and Debt Contracts," *Journal of Law and Economics* 36 (1993): 595-632.
- Stigler, George J. "Two Notes on the Coase Theorem," *Yale Law Journal* 99 (1989) 631-633.
- Stiglitz, Joseph E. "A Re-Examination of the Modigliani-Miller Theorem," *American Economic Review* 59 (1969): 784-793.
- Stiglitz, Joseph E. "Information and the Change in the Paradigm in Economics," In *Les Prix Nobel; The Nobel Prizes 2001*, edited by Tore Frangsmyr, pp. 472-540. Stockholm: Nobel Foundation, 2002, at 508.
- Stulz, René M. "Merton Miller and Modern Finance," *Financial Management* 29 (2000): 119-131.
- Telser, Lester G. "Why There Are Organized Futures Markets," *Journal of Law and Economics* 24 (1981): 1-22.
- Treynor, Jack "The Value of Control," *Financial Analysts Journal* 49 (1993): 6-9.
- Weiss, Lawrence A. "Bankruptcy Resolution: Direct Costs and Violation of Priority Claims," *Journal of Financial Economics* 27 (1990): 285-314.