




GEORGE G. TRIANTIS 

## The Business of Contracting

AFTER GRADUATING FROM LAW SCHOOL at the University of Toronto, George Triantis practiced corporate and bankruptcy law for two years. His decision to leave practice for academics was triggered by a joint frustration and fascination with boilerplate terms and precedents in transactional practice. “I wanted to know how they came into being, why they became boilerplate and why they didn’t change much over time,” he explains. “I began to see that academic theorizing offers an understanding of the legal world that would take years and years to acquire by experience in practice.” Triantis has established himself as one of the country’s premier legal scholars in the areas of contract theory and corporate finance.

Triantis’s research focuses on the incentive and information problems that afflict contracting. In an ideal world, a contracting party would not only have superior information or expertise to undertake its designated task, but also have strong incentives to do it well. Unfortunately, as Triantis notes, the two often do not go together. The result is a trade-off in which the parties must decide how much authority or discretion to delegate to the person who has the information or expertise, but not the best incentives. For example, investors would like to fully exploit the experience and expertise of corporate managers.

However, managers do not have investor interests completely at heart. The investors may try to realign a manager's incentives through the structure of her compensation. However, they may also withhold some decision-making authority from the manager and constrain her discretion. Triantis elaborates this theory to explain the law relating to the boundaries of various legal organizations (such as corporations and trusts), to the design of hierarchical structures within organizations, and to simple contracts. In "Organizations as Internal Capital Markets" (Working Paper, U. Virginia 2002), he explores these mechanisms in both the commercial and charitable sector of the economy.

Triantis has also used this lens to explain the patterns and law of secured credit. Security interests constrain managerial discretion in many ways: with important exceptions, security interests prevent the disposal of collateral and inhibit the manager's access to future financing. But these constraints are partial, not total, and that fact is critical. If security interests completely tied a manager's hands, they would also waste the potential value of the manager's expertise. Triantis has argued that this trade-off explains the various exceptions to these restrictive features of security interests. For example, security interests do not follow collateral into the hands of buyers in the ordinary course, and a purchase money security interest may award higher priority to a creditor who finances a new acquisition. Triantis elaborates this analysis in several articles, including "A Free-Cash Flow Theory of Secured Debt and Creditor Priorities", 80 *Va. L. Rev.* 2155 (1994), and "Financial Slack Policy and the Laws of Secured Transactions", 29 *J. Legal Studies* 35 (2000). He also extends the theory to bankruptcy in "A Theory of the Regulation of Debtor-in-Possession Financing", 46 *Vand. L. Rev.* 901 (1993). A company undergoing reorganization in bankruptcy can obtain new financing through so-called debtor-in-possession lending, but only subject to the bankruptcy court's case-by-case approval. This provides the bankruptcy court a means of relaxing the restrictions on management in appropriate cases. Triantis recently collected his various insights on the effect of priority schemes on managerial decision-making in a book, *The Law and Finance of Secured Credit* (forthcoming Foundation Press 2003).

Triantis introduced real options analysis to the study of contract law in an article presented at a conference in 1991 on the treatment of contracts in bankruptcy, "The Effects of Insolvency and Bankruptcy on Contract Performance and Adjustment", 43 *U. Toronto L.J.* 679 (1993). Most prior scholarship on options considered traditional options on financial assets such as shares of stock. A real option, by contrast, is one in which the underlying asset is a "real" asset such as a business, a factory, a patent, or so on. Often, such an option is not a formal contract, but simply a way of characterizing a party's ability to defer a decision until more information becomes available. Flexibility of this type may arise in the form of a legal right.

Triantis observed that an executory contract enforceable by money damages has the characteristics of a real option. That is, the promisor can wait until the time for performance to decide whether to perform or pay damages. By that time, the promisor may have more information about the cost of performing. Thus, Triantis demonstrated that the value of a contract lies not only in the expected payoffs of the contracted-for exchange, but also in each party's option to breach and pay damages. Triantis noted that this option affects the promisor's incentives in various ways. For example, it may lead the promisor to take greater risks in structuring performance: after all, if a novel cost-saving technique fails miserably, the promisor can abandon it and pay damages rather than incur the high cost of performance. Triantis later collaborated with his brother, Alex, a finance professor at the University of Maryland, to analyze the conditions under which a promisor would exercise this option by repudiating before performance was due. They analyzed this decision as a product of a trade-off between the benefit from inducing the promisee to mitigate by repudiating, and the cost of extinguishing the valuable option to later perform. Their article, "Timing Problems in Contract Breach Decisions", 41 *J. Law and Econ.* 163 (1998), criticizes the doctrine of anticipatory repudiation for giving incentives to the promisor to repudiate prematurely, thereby undermining the value of the initial contract.

Triantis' recent projects employ the tools of information economics and real options to address issues raised in the new economy. In "Financial Contract Design in the World of Venture

Capital”, 68 *U. Chi. L. Rev.* 305 (2001), he compared patterns of contracting in venture capital with the those of conventional bank loan contracts, and argued that the only significant innovation in venture capital contracts with start-ups is the use of convertible debt (or convertible preferred equity). He identifies, nevertheless, a number of significant benefits from using convertible securities that are unavailable to commercial banks because of federal regulation that restricts their ability to hold equity interests in their borrowers. Triantis’ interest in convertible securities dates back to an earlier article, “Conversion Rights and the Design of Financial Contracts”, 72 *Wash. U. L. Q.* 1231 (1994), coauthored with Alex Triantis. The article compared convertible debt with the rarer form of stock with an embedded put option that is redeemable for a note of the corporation. They demonstrated that, while the two types of instruments are effectively identical in the payoffs to the investor in different states of the world, they have distinct typical governance rights that explain why the conversion right is regulated by law when it exists in stock with a put option, but not in convertible debt. A holder of the former instrument cannot redeem her stock for cash or a note when the firm is undercapitalized, even if the conversion right is fully disclosed in financial statements.

The new economy is founded on human capital. As financial markets developed and opened new access to financial capital, the contract between a firm and its human capital gained increasing prominence. Triantis coauthored a working paper with Alex Triantis and Eric Posner of the University of Chicago, “Investing in Human Capital: The Role of Covenants Not To Compete” (U. Virginia Working Paper), that examined the role of covenants not to compete in these contracts. The conventional wisdom views these covenants as mechanisms preventing employees from leaving and competing against their employers. However, employees (or their new employers) frequently buy themselves out of the restrictive covenant. The authors demonstrated that this renegotiation allows the employer to recover the value of its investment in the employee, which may be socially desirable if that investment is useful in the new employment, but bad otherwise. The prospect of excessive investment by employers may be additional justification for the judicial reluctance

to enforce covenants not to compete.

Triantis’ current work on contracting behavior concerns the use of vague contract terms. Conventional economic analysis of contracts suggests that parties avoid vague terms because they invite costly litigation and uncertainty over their application by future courts. Yet contracts in the real world regularly invoke vague standards such as commercial reasonableness. As a result, there is a significant gap between theoretical predictions and commercial practice. Triantis provided some justification for such terms in “The Efficiency of Vague Contract Terms”, 1065 *La. L. Rev.* 62 (2002). This article was a first step in a broader effort to examine how contracting parties anticipate future litigation strategies and outcomes in their original contract. Triantis subsequently coauthored an innovative paper with his colleague, Chris Sanchirico, suggesting that parties may deliberately agree to contract terms that invite fabricated evidence at a future trial. In “Evidence Arbitrage: the Fabrication of Evidence and the Verifiability of Contract Performance” (U. Virginia Working Paper 2002), the authors defend the counterintuitive idea that contracting parties may prefer that each have the opportunity to present false evidence. Triantis and Sanchirico note that the parties might not be concerned that a court will err in its fact-finding because the prospect of fabrication might actually enhance the parties’ incentives to perform their obligations while reducing expected litigation costs.

In a seminar that Triantis teaches with colleague and former Dean Robert Scott, the students are encouraged to test various theoretical propositions by examining contracts and contracting patterns in the real world. This is an onus that Triantis firmly believes academics should carry, particularly in the area of private law. His belief is borne out in his teaching, research, and in his capacity as an editor of the *Journal of Law & Economics*. “Our work should explain the world we live in first, before recommending how it ought to be improved,” Triantis argues. “If we cannot succeed in the former task, there is no point moving to the latter.” Triantis came to academia in search of explanations for what he observed in the patterns of corporate practice. Now, he and his students seek to return to the real world as a testing ground for his theoretical contributions. ❖

# Timing Problems in Contract Breach Decisions

Alexander J. Triantis, University of Maryland and George G. Triantis,  
University of Virginia

TIMING PROBLEMS IN  
CONTRACT BREACH  
DECISIONS  
61 *J.L.&Econ.* 163 (1998)

## II. THE REAL OPTION TO BREACH

THE VALUE OF A *PRESENT EXCHANGE* to one party is the difference between the value of what is received (which we call the price,  $P$ ) and the cost of what is given ( $C$ ). Thus, the net value from the exchange ( $P - C$ ) may be positive (profit) or negative (loss). If the price is greater than the cost, the exchange yields a profit that may be as high as the price itself (if the cost is zero). If the cost is greater than the price, the exchange produces a loss (if the cost of performance is unbounded on the upside, so is the potential loss). Contract law enforces and thereby enables an *executory* contract: promises to complete an exchange at some time in the future. We assume that  $P$  is constant (that is, a fixed price with no possibility of default by the promisee) and that the cost of performance,  $C$ , is a random variable that determines the profitability of the exchange to the promisor.<sup>13</sup> At the time of the contract, the promisor faces a distribution of possible net payoffs from the future exchange that range from infinitely large losses to a profit equal to the contract price. Our assumption that the promisor faces variable cost of performance and a fixed payment from the promisee can easily be flipped to allow for the promisor to owe a fixed payment and be entitled to performance from the promisee of variable value.

The usual mode of enforcement of promises in common-law jurisdictions is the sanction of damages. As a consequence, a promisor usually holds an option to breach and pay money damages ( $D$ ) to the promisee.<sup>14</sup> In fact, the cost of breaching is usually higher than damages and includes the cost of litigation and reputational sanctions for breaching. To keep the discussion simple, however, we assume that the option to breach may be exercised simply by paying damages. Courts usually award expectation damages: an amount that puts the promisee in as good a position as if the promise were performed. If the loss from executing the promised exchange is greater than the damages, the promisor will exercise its option to breach. Thus, the promisor's payoff from the exchange is  $P - C$ , except that the promisor can never be worse off than to lose the amount of damages ( $-D$ ). Options theory allows us to frame the promisor's option in several ways. For expositional purposes, we analyze the value of the executory contract to the promisor as equal to the value of the exchange in the absence of breach ( $P - C$ ) plus the value of a call option on the cost of performance ( $C$ ). The call option on  $C$  has an exercise price equal to the contract price plus the damages ( $P + D$ ): when the promisor breaches, she forgoes the right to collect the contract price ( $P$ ) and is liable to pay damages ( $D$ ).<sup>15</sup> Given assumptions of fully compensatory expectation damages, perfect enforcement, and no insolvency, the value of the option at the time it is exercised is the difference between the cost of performance to the promisor and the value of the promise to the promisee ( $P + D$ ).

The breach option is an American option: the promisor can exercise the option by repudiating at any time between the contract and the date set for performance. By its very nature (bounded downside risk), an option's value varies with the length of time during which it can be held. Therefore, as a general matter, the holder of an American option should hold the option to maturity. A promisor might choose to repudiate early in order to compel the promisee to mitigate and thereby reduce the promisor's liability for breach. In our options framework, the exercise price of the breach option is the sum of the contract price and money damages. Therefore, a promisor might be tempted to exercise before maturity because, by requiring the promisee to mitigate,

she can hold down the exercise price of her call option and thereby increase the option's value. Thus, the trade-off defined in the introduction can be restated as follows. At any time before the date set for performance, the promisor chooses between exercising its breach option early at a more favorable strike price or later at a less favorable strike price.



#### IV. OPTIONS TO BREACH AND THE EFFICIENCY OF ABANDONMENT DECISIONS

Throughout the discussion thus far, we have implicitly assumed a unilateral option: the promisor holds an option to breach while the promisee is certain not to breach. In reality, however, a contract is often executory on both sides and either party may breach. Both parties hold options to breach. Moreover, the exercise of one party's option effectively terminates the other party's options. As we noted above, the value of an option varies with the time to maturity of the option. In the unilateral option case, the maturity date is fixed by contract at the date set for performance. In a bilateral option case, the maturity date of one party's option is the earlier of the contract performance date and the termination decision of the other party. This makes it more difficult for a party to value the remaining life of an option at any point in time and therefore to decide whether to repudiate.

Consider a firm whose research and development activity has yielded the design of a novel product for sale to consumers. To exploit this opportunity, the firm must first design and build a machine to manufacture the product. The firm enjoys flexibility in the timing of its investment. In particular, the firm can decide to accelerate or delay the construction of the machine. Each time the firm considers its option to invest, its decision depends on the expected cost and value of the machine. The value of the machine is the present value of the expected revenue from sales of the consumer good less the manufacturing and selling costs. The cost of building the machine is uncertain because it is a function of changing technology and input prices. The value of the machine is also uncertain because it varies with, for example,

consumer tastes. The ability to defer construction and wait for the resolution of some uncertainty is valuable. Even if the machine has a positive net present value at a given point in time, the firm may be better off waiting. Its susceptibility to fluctuations in the cost and value of the machine is skewed because of the firm's ability to walk away from the project if it is expected to result in losses. Indeed, it is only because there are countervailing costs to waiting that firms invest in opportunities at all rather than defer indefinitely.

Perhaps the most obvious cost to deferring construction of the machine is the time value of money: a dollar of profit tomorrow is worth less than a dollar of profit today. There are significant other costs such as the decision of a competitor to exploit the same or a rival opportunity. Thus, in choosing whether to invest or defer, the firm must weigh these costs against the value of holding on to its option. There is another type of cost to holding on to an option. It includes the cost of retaining technical expertise on the payroll and of updating information concerning technology or consumer demand. Indeed, the presence of these irrecoverable costs suggest that the choice of the firm is not simply whether or not to exercise its option to invest but also whether to abandon it. The firm should abandon the option when its value is lower than the cost of preserving it. In reality, the choices of the firm may not be as discrete as we have just stated. A firm may adjust the rate at which it exploits an opportunity by accelerating or decelerating its investment. As the rate decreases below a certain level, the option is extinguished and can be resurrected only at substantial cost. Thus, if a firm observes unfavorable information about a project's payoffs, it may avoid at least some of the downside by abandoning the project even after it has started investing in it.<sup>32</sup> Our focus in this article is on this abandonment decision and its contracting parallel, the repudiation decision.

A firm decides not only when, but also how—or by what governance structure—to exploit the available project. In particular, it must choose the extent to which it will integrate production within the firm and the extent to which it will contract with outside entities. For example, the firm may contract to purchase the machine from a supplier who undertakes to design and con-

struct the machine. The firm will then manufacture the consumer product, market it, and sell it. If the firm decides to purchase the machine, it will likely enter into an executory contract in order to encourage valuable reliance (or relationship specific) investments: for example, the seller may design and build a prototype of this specialized machine, and the buyer may retain technicians who will be trained and ready to service the machine when it arrives. The division of the investment opportunity by contract also splits the abandonment decision between the parties and thereby has an adverse impact on the timing of abandonment.

To many economists, the integration (or make-or-buy) decision is a choice between governance structures.<sup>33</sup> Contracts within a firm have different governance characteristics than external contracts. In particular, employer-employee contracts are thought to be categorically different from relations with contractors outside the firm, even though they both provide labor to the production process.<sup>34</sup> A similar contrast exists in connection with the financing of production. When production is integrated in a single firm, the entrepreneur must usually obtain external financing through debt or equity contracts (financial contracts). If the task—such as the construction of the machine described above—is contracted out to a supplier, this “real” contract includes an implicit financing component as well. The seller must expend resources before recovering the contract price from the firm. In the case of financial contracts, agency problems arise because of the separation of decision-making authority and risk bearing. In the case of “real” contracts, decision-making control is instead shared between the contracting parties who also split the payoffs from the project. This sharing also gives rise to agency problems. In the discussion that follows, we discuss and contrast both types of agency problems as they affect decisions to abandon projects over time.

Financial agency theory has established that the decision of a single firm to exploit an opportunity is affected by its capital structure. In particular, a levered firm controlled by shareholders has the incentive to forgo (or abandon) some profitable opportunities of low risk, because the payoffs from the project will be captured by its debtholders in the event of insolvency.<sup>35</sup> At the same time, the firm’s shareholders may induce the firm to continue to

invest large sums to preserve a very risky option whose value is less than the cost of keeping it alive.<sup>36</sup> Thus, financial agency theory predicts that the division of payoffs from an investment opportunity between active and passive investors can lead to inefficient decisions to exploit or abandon the opportunity. When the variance of a project is high, a leveraged firm controlled by its shareholders will tend to pursue projects beyond the time at which efficiency dictates abandonment. In short, they may “overinvest” by failing to discontinue at the optimal time. Conversely, when the variance is small, they may “underinvest” by abandoning the project too early in order to move into riskier projects. Lenders and borrowers therefore structure their agreements (maturity, collateral, events of default) in order to redress some of the distortion of incentives. These contracting measures reduce but do not eliminate agency costs because of the impact of transaction costs, the bounded rationality of the parties, and the surrounding conditions of uncertainty.

A firm might instead share the investment project with another entity who does more than provide financing: a “real” contractual arrangement that exploits, for example, economies of specialization, scale, or scope of the other firm. By contracting out the construction of the machine, the firm decides to share with its supplier the decision to accelerate or decelerate the exploitation of the opportunity and, in particular, the decision to abandon the investment option. This division of payoffs and of decision-making authority raises concerns that are similar to the financial agency problems referred to in the preceding paragraph. And, as in financial contracts, the parties have incentives to structure their agreements so as to minimize these agency costs. The expectation measure of damages in contract law does not compensate a promisee for the loss of the time value of its option to breach caused by the repudiation of the promisor. The absence of such compensation leads to inefficient repudiation decisions, which cause contracting parties to abandon some investment opportunities earlier than a single firm (with a single owner) would have. As a result, there is a significant agency cost to contracting that is comparable to the financial agency costs that arise when a project is exploited in a single, leveraged firm. ❖

## FOOTNOTES

- 13 We include in the cost of performance the value of the best available nonexclusive opportunities to deal with another party that are necessarily forgone when the promisor performs. The cost of performance is bounded at the top by the cost of procuring substitute performance in the market, if such substitute is available.
- 14 See Oliver Wendell Holmes, Jr., *The Common Law* 300-301 (1991); *Globe Refining Co. v. Landa Cotton Oil Co.*, 190 U.S. 540, 543 (1903) (Holmes, J.) (promisors may elect between performing or paying damages). Holmes's characterization of contract breach has attracted considerable criticism from contract theorists. See, for example, P. S. Atiyah, *Essays on Contract* 60-66 (1986); J. Finnis, *Natural Right and Natural Law* 324 (1980); Steven Walt, "For Specific Performance under the United Nations Sales Convention," 26 *Texas Int'l L. J.* 211, 239-49 (1991).
- 15 Alternatively, the contract can be looked at as a certain liability to pay damages plus a put option on the level of the cost of performance, with an exercise price equal to the sum of the contract price ( $P$ ) plus the damages ( $D$ ). The two descriptions of the interest of a contracting party are equivalent according to what is known as put-call parity. See, for example, Hans R. Stoll, "The Relationship between Put and Call Option Prices," 24 *J. Fin.* 801 (1969).
- 32 The decision to abandon a project was first modeled in Alexander A. Robichek & James C. Van Horne, "Abandonment Value and Capital Budgeting," 22 *J. Fin.* 577 (1967). It was later analyzed using an options pricing framework in Michael J. Brennan & Eduardo S. Schwartz, "Evaluating Natural Resource Investments," 58 *J. Bus.* 135 (1985); Avinash K. Dixit, "Entry and Exit Decisions under Uncertainty," 97 *J. Pol. Econ.* 620 (1989); Stewart C. Myers & Saman Majd, "Abandonment Value and Project Life," 4 *Advances Futures Options Res.* 1 (1990). The abandonment of projects involving gradual or sequential investments is modeled in Kevin Roberts & Martin L. Weitzman, "Funding Criteria for Research, Development and Exploration Projects," 49 *Econometrica* 1261 (1981); Saman Majd & Robert S. Pindyck, "Time to Build, Option Value, and Investment Decisions," 18 *J. Fin. Econ.* 7 (1987); and Avinash K. Dixit & Robert S. Pindyck, *Investment under Uncertainty* 319-56 (1994).
- 33 See, for example, Oliver E. Williamson, "Transaction Cost Economics: The Governance of Contractual Relations," 22 *J. Law & Econ.* 233 (1979).
- 34 See, for example, R. H. Coase, "The Nature of the Firm," 4 *Econometrica* 386 (1937); Armen A. Alchian & Harold Demsetz, "Production, Information Costs and Economic Organization," 62 *Am. Econ. Rev.* 777 (1972); Benjamin Klein, "Vertical Integration as Organizational Ownership: The Fisher Body-General Motors Relationship Revisited," 4 *J. L., Econ. & Org.* 199 (1988).
- 35 This is known as the underinvestment problem. Myers, *supra* note 11, at 147.
- 36 This is an instance of the overinvestment problem, which stems from the interest of shareholders in increasing the riskiness of a levered firm. Michael C. Jensen & William H. Meckling, "Theory of the Firm: Managerial Behaviour, Agency Costs, and Ownership Structure," 3 *J. Fin. Econ.* 305, 333-37 (1976).



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