

Making the Case for Contract Theory

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Economics has changed a great deal in the last thirty years and there is every reason to think that the changes in the next twenty to thirty years will be at least as great. In the 1970's and 80's theory was dominant. In the first part of the twenty first century this is no longer the case: there has been a huge shift towards empirical work. Also new fields have become established that were in their infancy in 1980: behavioral economics is the most obvious example.

At the same time although much has changed some things stay the same. Although theory may not be as prominent as it once was, it remains essential for understanding the (increasingly) complex world we live in. One cannot analyze the bewildering amount of data now available without the organizing framework that theory provides. I would also suggest that one cannot understand the extraordinary events that we have recently witnessed, such as the financial crisis, or make sensible policy recommendations in response to these events, without the organizing framework of theory. Moreover, although exciting developments in other fields of economics understandably attract attention, basic research in theory remains vital. There is much that we still do not understand.

Contract theory is a good example of an area where great progress has been made over the last thirty years, and yet where much remains to be done. There is, of course, a sense in which contracts have always been basic in economics. Any trade—as a quid pro quo—must be mediated by some form of contract, whether explicit or implicit. However, much of traditional economics is concerned with spot trades, where the two sides of the transaction occur simultaneously, and where the contractual element is relatively trivial. In recent years economists have become much more interested in long-term relationships where a considerable amount of time elapses between the quid and the quo. In these circumstances a contract becomes an essential part of the trading relationship.

The basic philosophy behind contract theory is the idea that parties can design their relationship to be efficient and that a contract is the means to do this. In this respect there is significant overlap with the mechanism design literature. However, there are also important differences. In mechanism design theory it is usually assumed that there is an impartial planner who oversees the system, and may indeed design it. In contract theory the mechanism is designed by the parties themselves and the only (possibly) impartial player is a judge who adjudicates disputes. Each literature has learned from the other, but they have developed independently.

The techniques of contract theory have permeated many areas of economics, including labor economics, industrial organization, macroeconomics, corporate finance, international trade, public finance, and development economics. Contract theory also draws on and contributes to ideas in law and economics. In this short essay I will discuss some of the major themes of contract theory and also issues that are still not well understood.

A classic topic of contract theory is the design of incentive schemes. Principal-agent theory studies how a principal, e.g. an employer, can motivate an agent, e.g., an employee, to act in her interest. A formal contract can tie the agent's compensation to the outcome of the agent's actions. The early literature emphasized the employee's desire to shirk as the main incentive problem, and the employee's risk aversion as the main reason why making compensation very sensitive to outcome—high-powered incentives—might not be a perfect solution. The more recent literature has emphasized different issues. Suppose that the principals are the shareholders of a public company and the CEO is the agent. The problem may not be that the CEO does not want to work hard: rather it may be that the CEO is an empire-builder, takes excessive risks, pays himself too much (or in the wrong sort of way), or is over-confident about his ability to run things. Or suppose that the principals are parents and the agent is the teacher of their children. The problem may be that it is hard to measure the true outcome of teaching. Performance on tests can be assessed but this may be a very imperfect measure of what children should be learning. Paying a teacher according to test performance may encourage the teacher to focus on the wrong things: rote learning rather than more creative material. Also educating a child is a team process, and, if a teacher is rewarded narrowly according to the test scores of children directly under her control, she may be discouraged from collaborating with other teachers.

The compensation of CEOs, teachers, and others, is highly topical. There is no shortage of proposals for improving matters. Contract theory is enormously useful in clarifying the trade-offs and helping us to avoid the adoption of policies that may actually be counter-productive.

Advances in technology make it possible to measure performance more finely and in the future it will become feasible to pay people in increasingly subtle, and possibly high-powered, ways. But is such a trend desirable? Or might it interfere with the reason that the employees are under the umbrella of a single firm in the first place? The question of what constitutes a firm, what's different about transactions inside and between firms, and what determines the boundaries of firms, is one that contract theorists have studied intensively. The early transaction cost literature on this topic, by Coase, Williamson, and others, was insightful but largely informal. In recent years, contract theorists have developed formal models to elucidate these issues.

The starting point of this recent literature—known as the property rights approach—is the idea that if parties can anticipate all future eventualities and include these in a contract then the boundaries of the firm are irrelevant: it is only if contracts are incomplete that boundaries matter. In practice contracts are incomplete and a key question is who has residual rights of control, that is, the right to make decisions not covered by the contract. The property rights approach takes the view that the owner of an asset has residual control rights. In the simplest property rights model parties can renegotiate an incomplete contract once an unforeseen contingency has occurred and, under symmetric information, they will reach an ex post efficient outcome. However, the division of surplus will depend on the assets they own. This division of surplus will in turn influence the incentives of parties to invest. An implication of the theory is that assets will be owned by those whose investments are important. To the extent that one can identify a firm with the assets it owns this yields a theory of firm boundaries.

As an example of how this more formal approach can be useful, consider the question of how improvements in information technology will affect firm boundaries. It is often argued that, because more information makes it easier to write good contracts, advances in information technology will favor independent contracting: carrying out transactions outside the firm. Indeed this is an implication of transaction cost economics. The property rights approach provides a more nuanced perspective. A reduction in contracting costs also makes it easier to carry out transactions inside a firm and so firms may become bigger rather than smaller. Support for this possibility has been found in empirical work.

The property rights approach has been applied extensively in the recent international trade literature on the structure of multinational companies. Antras (2003) uses the approach to explain why U.S. companies are less likely to own foreign suppliers if the goods they import are labor intensive (in which case the human capital investment of the foreign firm is likely to be important) than if they are capital intensive (in which case the physical capital investment of the U.S. firm is likely to be important). Many other papers have extended this work.

One limitation of the property rights approach is that the standard model does not explain why transactions inside firms have a different character from those between firms: the theory supposes that parties will use monetary sidepayments to bargain to an ex post efficient outcome whether the parties are in the same firm or in different firms. This does not square with an observation of Coase that inside firms the price mechanism is superseded. Recent work has argued that it is possible to explain Coase's observation if one is willing to step outside the standard framework and introduce some psychological considerations, including the idea that contracts are reference points for entitlements.

Psychological and behavioral elements can broaden the scope of contract theory in many interesting ways. Recent theoretical and experimental work has argued that explicit contracts can interfere with feelings of fairness and trust and as a consequence extrinsic motivation can crowd out intrinsic motivation. Given this, informal and incomplete contracts may outperform formal and complete contracts even when the latter are feasible. This provides new insights into why high-powered incentives may be costly, and why parties may deliberately write incomplete contracts. Contracts may also be written by one party to take advantage of the cognitive limitations of another party. All this work is informed by experiments. It seems likely that in the future collaborations between contract theorists and experimentalists—both in the lab and in the field—will yield important new insights, and help contract theorists to refine the assumptions they make.

Another significant application of contract theory has been to understand firms' financing decisions. Consider an entrepreneur who has an idea for a firm or project but does not have the funds to finance it. The entrepreneur might borrow from an investor. But should the borrowing be short-term or long-term? How much collateral does the entrepreneur need to provide? Might it be better for the entrepreneur to issue equity rather than debt? Or might some sort of hybrid security be preferable to both?

Many of these questions are, of course, studied in the standard corporate finance literature. The difference is that this literature takes the form of the securities a firm issues as given: equity or debt. In

contrast, the financial contracting literature considers all possible contracts or securities and tries to explain why debt or equity may be optimal among these. This has yielded new insights.

Economists are still grappling with the causes of the recent financial crisis. Although there is not yet consensus, most explanations are based on the idea that key institutions had excessive debt, that much of this debt was short-term, and that the failure of one institution triggered the failure of others. There is also a widely held view that banks and other financial institutions are different: they are more sensitive than regular industrial companies, and hence their failure is more serious. But why? Economists do not have fully convincing answers to these questions. Did institutions write suboptimal contracts with their investors (or for that matter with their customers, e.g., home-owners), or were these contracts individually optimal but collectively suboptimal? What does a bank do that makes it different from other firms? How should large financial institutions be regulated to prevent the next financial crisis? The tools of modern contract theory seem indispensable if we are to make progress on these vital questions. But inevitably answering these questions will require new thinking. Understanding the financial crisis requires putting contract theory into a general equilibrium perspective. Although Kiyotaki and Moore (1997) have made a notable start in this direction, much remains to be done. The next twenty years promise to be challenging and exciting.

References

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