The Real Coase Theorems

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The "Coase theorem," in one respect, is a triumph of social science scholarship. Web searches using "Coase theorem" as key words typically yield over 100,000 hits. Economists, legal scholars, environmentalists, and political scientists have written volumes on the theorem. Few ideas written by economists in the 20th century have been as widely debated. And the debating continues, 47 years after the publication of "The Problem of Social Cost" (Coase 1960), the essay recognized as the source of the ideas in question. There is only one problem: Ronald Coase maintains that the theorem that bears his name conveys an idea that is antithetical to the message that he intended.

My view is that virtually all of the criticism of the Coase theorem fails to appreciate the actual message that Coase intended with "Social Cost" and is, therefore, essentially irrelevant. Tragically, because we have focused on what he was not saying, we have not grasped what he *was* saying. Consequently we have been neither sufficiently appreciative nor sufficiently critical of his actual message.

Coase on the Problem of Social Cost

With the publication of *The Firm, the Market and the Law* (Coase 1988), a collection of essays which republished "The Problem of Social Cost" and "The Nature of the Firm" and which also included insightful reflections on the legacies of those articles, Coase (1988)

Cato Journal, Vol. 27, No. 3 (Fall 2007).

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broke his protracted silence on the way in which his work had been interpreted by economists, legal scholars, and other social scientists. He contends, "My point of view has not in general commanded assent, nor has my argument, for the most part, been understood." He attributes this lack of understanding to the fact that "most economists have a different way of looking at economic problems and do not share my conception of the nature of our subject" (Coase 1988: 1). Among his specific points of departure from the mainstream, he holds the view that economists' preoccupation with studying the logic of optimal choice has caused them to neglect the study of the institutional setting in which choice takes place and that this has eroded the substance of economic research, that human action cannot be adequately characterized as a constrained optimization problem, and that modern economic theory ignores the role of transaction costs (Coase 1988: 3–7).

Perhaps the most revealing statement that Coase (1988: 13) makes about the theorem that bears his name is the following:

> "The Problem of Social Cost" . . . has been widely discussed in the economics literature. But its influence on economic analysis has been less beneficial than I had hoped. The discussion has largely been devoted to sections III and IV of the article and even here the discussion has concentrated on the so-called "Coase theorem," neglecting other aspects of the analysis. In sections III and IV, I examined what would happen in a world in which transaction costs were assumed to be zero. My aim in doing so was not to describe what life would be like in such a world but to provide a simple setting in which to develop the analysis and, what was even more important, to make clear the fundamental role which transaction costs do, and should, play in the fashioning of the institutions which make up the economic system.

Coase goes on to explain that a world without transaction costs is a peculiar world in which, among other things, firms would not exist (Coase 1988: 14–15). In fact, economic institutions, according to Coase, do not matter in a world without transaction costs.

Many critics of Coase have focused their attack on his apparent neglect of the existence of transaction costs in the real world. But this criticism is misplaced. Coase's discussion of the peculiar unreal world with no transaction costs was intended to draw out the strange implications of perfect competition, which he viewed as the central perspective in modern economic analysis. Sections II through IV of "Social Cost" were intended as a critique of economic theory circa 1960. They were not intended as a representation of the real world. Thus, much of the criticism that has been directed at "Social Cost" misses the mark. Coase (1988: 174) writes:

> 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. What I did in "The Problem of Social Cost" was simply to shed light on some of its properties. I argued in such a world the allocation of resources would be independent of the legal position, a result which Stigler [1966: 113] dubbed the "Coase theorem." . . . Economists, following Pigou whose work has dominated thought in this area, have consequently been engaged in attempt to explain why there were divergences between private and social costs and what should be done about it, using a theory in which private and social costs were necessarily always equal. It is hardly surprising that the conclusions reached were often incorrect. The reason why economists went wrong was that their theoretical system did not take into account a factor which is essential if one wishes to analyze the effect of a change in the law on the allocation of resources. This missing factor is the existence of transaction costs.

Coase offers the following interpretation of "Social Cost" in his Nobel lecture (Coase 1992: 717):

> Pigou's conclusion and that of most economists using standard economic theory was (and perhaps still is) that some kind of government action (usually the imposition of taxes) was required to restrain those whose actions had harmful effects on others (often termed negative externalities). What I showed . . . was that in a regime of zero transaction costs, an assumption of standard economic theory, negotiations between the parties would lead to those arrangements being made which would maximize wealth and this is irrespective of the initial assignment of rights. This is the infamous Coase theorem, named and formulated by George Stigler, although it is based on work of mine. Stigler argues that the Coase theorem follows from the standard assumptions of economic theory. Its logic cannot be questioned, only its domain (Stigler 1989: 631–3). I do not disagree with Stigler. However, I tend to regard the Coase theorem as a stepping stone on the way to an analysis of an economy with positive transaction costs. The significance to me of the Coase theorem is that it undermines the Pigouvian system. Since the standard economic theory assumes transaction costs to be zero, the Coase theorem demonstrates that the Pigouvian solutions are unnecessary in these circumstances. Of course, it does not imply, when transaction costs are positive, that government actions (such as government operation, regulation, or taxation, including subsidies) could not produce a better result than relying on negotiations between individuals in the market. Whether this would be so could be discovered not by studying imaginary governments but what real governments actually do. My conclusion: let us study the world of positive transaction costs.

Coase went on to explain that his hope was that the ultimate impact of "Social Cost" would be to transform the structure of microeconomics.

Other Criticisms of Coase

In addition to criticisms of Coase for ignoring the existence of transaction costs in the real world, he has also been upbraided by many writers for ignoring the wealth and income effects from changes in ownership or liability. Many attempts to disprove the Coase theorem amount to demonstrations that income or wealth effects of one sort or another would alter prices, production, individual well being, and other phenomena, when ownership or liability changes. But, like the charges regarding his alleged neglect of transaction costs, these criticisms miss the mark. If Coase is not telling a story about the real world in sections II through V, then the existence of income or wealth effects in that real world would not contradict his point. The economic theory that Coase is attacking had not, for the most part, ignored wealth or income effects. It had, in his estimation, ignored transaction costs.

Unrealism of the Theory of Perfect Competition

To Coase, a world without transaction costs is the world of perfect competition. He uses the expressions "the pricing system works smoothly" (1988: 97, 100, 102, 112), "the operation of a pricing system is without cost" (1988: 97, 102, 104, 106, 114) and "If the crop was previously sold in conditions of perfect competition" (1988: 98, 101) as interchangeable. The equation of perfect competition and a world without transaction costs is not unique to Coase. Stigler makes the same connection. In the first recorded reference to the "Coase theorem," Stigler (1966: 113) writes

> The Coase theorem thus asserts that under perfect competition private and social costs will be equal. It is a more remarkable proposition to us older economists who have believed the opposite for a generation, than it will appear to the younger reader who was never wrong, here.

This fact puts many of Coase's critics in a difficult position. Those who would argue that the conditions under which the Coase theorem would apply are unlikely to ever be realized must also argue, with equal enthusiasm, if they are to be consistent, that the conditions required for perfect competition are also unlikely ever to occur. If the Coase theorem cannot be used as a measuring stick against real world situations, then neither can perfect competition. Of course, this was exactly Coase's point. His exposition of a hypothetical world without transaction costs was developed precisely to illustrate the paradox intrinsic to the theory of perfect competition.

Perfect competition requires perfect information. Perfect information eliminates transaction costs. But this perfect information means that every member of a society must know, without effort and with perfect accuracy, all of the potential parties with whom he or she might enter into a market exchange as well as the terms of exchange that would be acceptable as well as the trustworthiness of all of these potential exchange partners. It is the absence of just this information that gives rise to transaction costs in the first place.

The practical implications of this criticism are explored in section VIII of the essay in Coase's critique of Pigou. The problem of using perfect competition as a standard for evaluating the performance of an existing situation is found to be deficient (Coase [1960] 1988: 142]).

> The Pigouvian analysis shows us that it is possible to conceive of better worlds than the one in which we live. But the problem is to devise practical arrangements which will correct defects in one part of the system without causing more serious harm in other parts.

It should now be clear that criticism of the Coase theorem that interprets the theorem as making claims about what happens in the real world is misplaced. This implies that virtually everything that appears in our economics textbooks and much of what appears in economics journals about Coase is, at best, irrelevant. This is not to say that the process described by the Coase theorem does not happen. If private ownership of natural or environmental resources exists and protections against trespass and nuisance are effective then bargaining within the context of a regime of liability rules can indeed resolve conflicts over resource use. But this is not Coase's thesis in "Social Cost."

Coase's exposition of the zero transaction costs world was intended as a criticism of economic theory circa 1960. He has continued to argue that, in spite of the increased attention being paid to transaction costs in the economics literature, that literature, does not yet fully appreciate the implications of transaction costs. This is not to say that economists have not written quite a bit about transaction cost economics since 1960. Clearly, they have. But professor Coase's most recent published view on this literature is that it has not fully appreciated his point of view. Harold Demsetz's (2003) recent essay and Carl Dahlman's (1979) classic paper are noteworthy exceptions to this general criticism, attempting as they do to develop the implications of transaction costs for the diagnosis of inefficiency.

On the Definition of Transaction Costs

Coase is generally acknowledged as introducing the concept of transaction costs into the economics literature in his 1937 essay "The Nature of the Firm." Unfortunately, much of what has been written has not been adequately informed by the way that Coase defined the phenomenon. As a result, much of the current economic literature on transaction costs is inconsistent or incoherent.

Two definitional issues are important. First, according to Coase, transaction costs arise only in market exchange. They represent the value of the resources that are used up in the process of conducting a market exchange. Modern literature on transaction costs has applied the term to other phenomena with unfortunate consequences. It is commonplace for economists to use the term transaction costs to refer to the value of the resources used up in the process of institutional change, including changes in government policy as well as the costs of establishing and defending ownership claims. While it is correct to acknowledge that institutional and policy changes are costly and that resources can be used up in establishing and protecting property rights, it would be better to have a separate terms to describe these costs, since the mechanism generating the costs is fundamentally different. Transaction costs arise under conditions of bilateral voluntary exchange of property. For the most part the new institutional economics has focused on changes brought about through the political process or on the costs of changes in institutional structures within firms.[1] These institutional changes involve costs, but the nature and the interpretation of the costs involved differ from those arising under voluntary exchange.

A second important Coasian definitional boundary that is almost universally transgressed in current literature has to do with the categories of costs that make up transaction costs. In his 1937 essay, Coase enumerated three categories of transaction costs ([1937] 1988: 38–39): (1) the costs of discovering what the relevant prices are, (2) the costs of negotiating the terms of an exchange, and (3) the costs of concluding that exchange. We now refer to the costs of discovering

[1] Institutional change can occur, as Hayek explained at various times (e.g., Hayek, 1945, 1973, 1976, 1979), through the evolution of an existing spontaneous order, and hence can occur within that realm of voluntary transactions among consenting adults. For the most part, however, the institutional change literature pioneered by Coase, Demsetz, North (1990, 1998), and Williamson (2000) does not make a consistent and clear distinction between institutional change in a spontaneous order and in a planned order. However, in practice, most examples of institutional change studied in this literature involve planned orders and hence lie outside the realm of voluntary transactions among consenting adults.

what the relevant prices are as search costs. Search costs are the value of the resources used up as people try to find potential partners for bilateral or multilateral voluntary exchanges. Negotiation costs consist of the value of the resources used up in the process of trying to reach mutually satisfactory terms for exchanges with those potential partners. Concluding costs represent the value of the resources used up by participants in an exchange to verify that other participants have complied with the agreed terms of the transaction.

Unfortunately, terminological drift has occurred and many contemporary economists call this third transaction cost category monitoring and enforcement costs. This drift has led to needless confusion. Unlike Coase's original use of the term "concluding" costs, monitoring and enforcement costs suggest that the parties are involved in an ongoing commercial relationship. But from a Coasian point of view, an ongoing commercial relationship is a contract. If that contract takes the form of authorizing one factor owner to direct the production activities of other factor owners, then this would be, in Coasian terms, a firm. Coase's explanation for the existence of firms is that these ongoing contractual relationships are an alternative to market transactions and that, by entering into such relationships, people can avoid transaction costs. But these relationships are not free: developing and maintaining relationships to sustain ongoing commercial interaction uses up resources. These resources have values and their use has an opportunity cost.

Monitoring costs, like the costs of managerial or entrepreneurial errors, are part of what Coase calls coordination costs within the firm. In calling the third category of transaction costs monitoring and enforcement costs, which is commonplace, we run the very real risk of losing the essence of Coase's distinction between the firm and the market.

Transaction costs figure prominently but not exclusively in Coase's explanation for the existence of firms as social institutions. In "The Nature of the Firm," Coase explains that "there is a cost to using the price mechanism" (Coase 1988: 38). One of the elements of that cost is the cost of "discovering what the relevant prices are" (Coase 1988: 38). In addition, there are "the costs of negotiating and concluding a separate contract for each exchange transaction which takes place in a market" (Coase 1988: 38–39). Coase's exposition could be easily misunderstood if taken out of context, since he used the term "contract" in two quite different senses in his theory.

A contract in a single market exchange involves concluding costs. A contract in a firm, however, involves a sustained relationship—a commitment to ongoing cooperation in a commercial activity—and this contract involves co-ordination costs by the entrepreneur. This durable contract, according to Coase, most typically involves the provision of labor services. In Coase's theory, the boundaries of the firm, in a general sense how big a firm becomes, are determined by the interplay of transaction costs and coordination costs. Transaction costs are incurred in market exchanges. As the costs of transacting in market exchange fall, relative to coordination costs, firms tend to get smaller, since it is less costly to obtain the services of factors of production through a market exchange than it is to bring the owners of those factors of production into the set of relationships that is the firm.

There are several reasons why transaction costs might fall. The most commonly offered explanation is the advance of information technology. According to this explanation, as computer hardware and software improved and as computer networking systems evolved and developed, the costs of search in particular have fallen. This would suggest that the boundaries of firms should shrink. On the other hand, advances in computer systems and networks could also reduce the internal costs of coordination within firms and reduce those costs as well. So a more complete Coasian theory would be ambivalent about the general effects of advances in information technology on the boundaries of firms.

There are other factors that influence the level of transaction costs. These have not attracted much attention from economists, but work in the field sometimes referred to as "social capital" is related. For example, the level of search costs will be influenced by freedom of speech and association. A free society allows people to signal willingness to transact and to form trade and other associations that serve as means of identifying and contacting groups of potential exchange partners.

The level of negotiation costs would be influenced by a tradition of protecting private property and enforcing contracts, thus encouraging potential parties to an exchange to negotiate in good faith. Institutional trust also reduces the risk for people who reveal what they might be willing to offer in exchange out of fear that someone might just take it from them. This tradition can also reduce negotiation costs if it raises people's confidence in making market transactions. There is generally more fear involved in the first purchase of a large item, like a house, than subsequent purchases. The transaction costs per vehicle are likely lower for someone who buys a new car every two years than for someone who buys one every 10 years.

Concluding costs may be influenced by a shared value of honest dealing in a society. Reputation and trust can play a role in this environment. Repeated dealings, or the prospect of repeated dealings, provide an incentive for people to fulfill their parts of an agreement to exchange. As the costs of coordination fall, relative to transaction costs, the firm tends to expand in order to economize on the relatively expensive transaction costs.

I offer these provisional examples for two reasons: first, to illustrate that the social and institutional context can influence the level of transaction costs in a particular community, and second, to show how little progress has been made on Coase's mission to transform the structure of microeconomics. More attention needs to be paid to understanding of the factors that influence transaction costs. Carl Dahlman (1979) has gone so far to suggest that the primary purpose of economic research should be to identify ways of reducing transaction costs, and thus expanding the scope of mutually beneficial exchanges through the market process.

The Legacy of the Problem of Social Cost

The consensus view on "The Problem of Social Cost" can be summarized as follows. Coase's analysis of a world with negligible transaction costs is an analysis of existing situations. There is no acknowledgment of the contradictions between assumptions of rational behavior, zero transaction costs, and a finding that under these circumstances unrealized gains from exchange can exist and persist. Criticism of the Coase theorem generally focuses on whether the case of zero or of negligible transaction costs is sufficiently commonplace to make Coase's analysis applicable.

George Stigler and the Coase Theorem

The first time "Coase theorem" appeared in the economics literature was in the third edition of George Stigler's *The Theory of Price* (Stigler 1966: 113). It appears in a section on "Private and Social Costs" that begins, ironically, by invoking the Pigouvian analysis of pollution. Having laid out the external cost analysis following Pigou, Stigler proceeds to introduce Coase's wandering cattle illustration from "The Problem of Social Cost." The importance of this seamless transition, in the present context, is that it fails to acknowledge the purpose that Coase himself clearly declares in "Social Cost." Pigou is Coase's frequent target in "Social Cost." His claim is that the pervasive influence of the point of view of Pigou's *The Economics of Welfare* (1938) had been harmful to economists' understanding of the nature of external cost problems and that economists' preferred remedies for external costs generally did more harm than good.

Most economics textbooks and articles follow Stigler's interpretation of the "Coase theorem":

> The manner in which the law assigns liability will not affect the relative private marginal costs of production of cattle and grain. But this procedure obviously leads to the correct social results—the results which would arise if the cattle and grain farms were owned by the same man. *The Coase theorem* thus asserts that *under perfect competition* private and social costs will be equal. . . . The proposition that the composition of output will not be affected by the manner in which the law assigns liability for damages seems astonishing. But it should not be. . . . The proposition must, to be sure, be qualified by an important fact. When a factory spews smoke on a thousand homes, the ideal solution is to arrange a compensation system whereby the homeowners pay the factory to install smoke reduction devices up to the point where the marginal cost of smoke reduction equals the sum of the marginal gains to the homeowners. But *the costs of this transaction* may be prohibitive—of getting the people together, of assessing the damages, and so on—so only a statutory intervention may be feasible [Stigler 1966: 113–14, emphasis added].

Note the smooth transition from a discussion of the hypothetical and impossible world of perfect competition in economic theory to statements about the real world of laws and liability rules. Stigler is caught in the Coasian paradox. The assumption of economic rationality combined with the omission of transaction costs as a functional and meaningful component of economic theory render the welfare economist's pathologies of efficiency vacuous. The presence of transaction costs is not a "qualification" to the proposition. It is a fundamental criticism of the then and currently dominant theory.

When Stigler introduces the term "Coase theorem" he treats it as a synonym for perfect competition. Unfortunately, he does not acknowledge that Coase's aim in sections II through V of "Social Cost" is to point out that a world without transaction costs—that is, a world where the conditions of perfect competition hold—would be a peculiar world indeed. Stigler (1966: 113) offers a defense of what he thinks is a perplexing inference of Coase—namely, that an initial pattern of ownership and liability rules have no influence on production, prices, or consumption in equilibrium—by arguing that in the real world "laws often prove to be unimportant." This representation seems to imply that the Coasian case of zero transactions costs is also the real world. Stigler does go on to discuss the case of a tortfeasor with a large number of victims, the industrial emitter imposing smoke damages on a large number of home owners, which he presents as a qualification of the Coase theorem. But he does not acknowledge that this is precisely the situation that Coase suggests is the general case in section VI of "Social Cost."

It is puzzling that there is no apparent connection between Stigler's discussion of Coase's 1937 essay on "The Nature of the Firm" and his discussion of "Social Cost." In his discussion of "The Functions of the Firm" (Stigler 1966: 168–71) does invoke Coase's analysis of transaction costs and the costs of internal coordination as factors influencing the boundaries of the firm. But the implication that a world without transaction costs is a world without firms is not acknowledged. Moreover, Stigler's qualification of the proposition that differences in liability rules have no effect on outcomes reaches exactly the conclusion I have called the "second *real* Coase theorem." In the presence of transaction costs, statutory intervention might improve efficiency, since voluntary transactions might not take place.

Coase in Context

Prior to "The Nature of the Firm" there had been some discussion of concepts closely related to what we now call transaction costs. For example, Carl Menger ([1871]1976) in his discussion of the marketability of commodities, a discussion that served as the foundation for his theory of money, wrote about the differences in time and effort associated with market exchanges of different types of commodities. But Coase is justifiably credited with raising economists' awareness that resources are used up simply in the process of making market exchanges.

Even on this point, however, Coase's original insight has been obscured by the common practice among economists of defining transaction costs as the sum of search costs, negotiation costs, and enforcement costs.[2] "The Nature of the Firm" was written as a response to a novel and fundamental question, "Why do firms exist?" With a few notable exceptions, such as Frank Knight (1921), economists had shown little interest in this question prior to 1937. In fact, they continued to show little interest in the question for 40 years after "The Nature of the Firm" was published. If pressed, the rationale economists would offer for the existence of these social institutions called firms is that they exist to earn profits. This answer is not completely satisfactory for two reasons. First, individuals can earn profits without going to the trouble of organizing a firm. Second, as

[2] Coase (1988: 6) attributes this definition, apparently with approval, to Dahlman (1979).

Coase explains, the firm is a curious institution that, at least to some degree, ignores the information available in market prices. How can this be a good thing economically? Coase's rationale for the existence of firms resolves this paradox. Firms are sustained relationships among owners of factors of production. These owners have contractual relationships with one another, possibly coordinated through someone called an entrepreneur or manager. The terms of these relationships may be recorded in written contracts or they may be less formal. The terms describe who is responsible for doing what within the firm and how compensation for owners of productive factors is to be paid. Both the responsibilities and compensation are determined internal to the firm. At any given point in time, they may not coincide with factor prices or employments observed in market transactions external to the firm. Establishing and maintaining these relationships is not easy. It takes time and effort.

Why would owners of factors of production and entrepreneurs go to the trouble of creating firms? The answer, according to Coase, is transaction costs. Production could take place without firms. Adam Smith's pin factory could operate as follows. One person could dig ore out of the ground and sell it to someone with a wagon and a horse. That person, in turn, could cart the ore to a port where they could be sold to a ship owner. The ship owner could sail to some other port and sell the ore to a smelter. The smelter could sell steel to a person who manufactures wire, the wire manufacturer could sell wire to someone who specializes in cutting wire to pin-like lengths. These pieces of wire could be sold to someone who sharpens one end to a point. This process could continue up to final delivery of pins to end-users.

Transaction costs are incurred at each point where the goods in process pass from one owner to the next through a free market exchange. Firms can avoid these transaction costs by establishing ongoing relationships among owners of factors of production employed in successive stages of the production process. Once these relationships are developed, it is no longer necessary to search for potential exchange partners nor is it necessary to negotiate the terms of those exchanges. The transaction costs disappear. However, new costs arise that did not occur in my hypothetical "production by the market" situation. The firm will need to monitor and enforce the terms of the contractual relationships among the factor owners involved in the firm. The firm avoids transaction costs in securing the services of the inputs brought into the firm, but it incurs management and coordination costs in making sure that those inputs are doing what they are supposed to do.

In addition, the firm incurs costs when the entrepreneur or the manager makes a mistake, directing inputs in a particular way that is different from what market prices and factor employments external to the firm indicate and it turns out that those markets where right and the entrepreneur was wrong. So avoiding transaction costs is a mixed blessing. Coase goes on to explain that the boundaries of the firm, what today we might describe as the size, scale, and scope of the firm, are determined by weighing transaction costs with internal coordination costs at the margin. Does adding a new factor owner to the set of relationships that make up the firm reduce transaction costs by more than it increases internal coordination costs? If it does, the firm should expand by absorbing the services of that factor of production. The limit to this expansion is reached when no further net cost savings can be achieved through continued agglomeration.

This is a rather long exposition of Coase's answer to the question "Why do firms exist?" But there is a reason for going into this much detail. "The Nature of the Firm" is a key to understanding "The Problem of Social Cost." In his 1937 essay, Coase explains that firms exist to economize on transaction costs. He offered this explanation to fill a gap in economic theory. Prior to 1937 there was no convincing rationale for the existence of firms in economic theory because transaction costs are not acknowledged by that theory. To Coase this omission was crucial because in the real world transaction costs are pervasive. "The Problem of Social Cost" was published 23 years later. That paper begins with five sections that discuss a world without transaction costs. Understanding the nature of the world Coase is addressing in these introductory sections is critical to a correct understanding of what his later article is all about.

If a world with negligible transaction costs is intended to describe a common situation in the real world, then the standard textbook treatment of "Social Cost" would be correct. But a world without transaction costs, according to Coase, is a world without firms. Without transaction costs to avoid, there is no reason to go to the trouble of organizing firms. It is clear that firms did not disappear between 1937 and 1960. Thus, if Coase, the person who argued so vigorously that the neglect of transaction costs was a critical omission from economic theory in 1937, seems to be arguing that transaction costs had disappeared by 1960, then either he has changed his mind or we are missing something. Coase's view by 1988 is that he was expressing a consistent point of view in "Social Cost" as he was in "Nature of the Firm." So if we are to make sense of "The Problem of Social Cost" in light of the context of Coase's other work, we need another explanation. The world of negligible transaction costs discussed in the first five sections of "Social Cost" is not the world in which we live.

Paradox Lost

Daniel Farber (1997) has offered an interpretation of "The Problem of Social Cost" which, while rendering virtually all of economists' commentary on the original paper irrelevant, has the advantage of relating the 1960 essay consistently to Coase's other writing. Farber's interpretation is that Coase is presenting a parody in sections III through V of the essay. It is a parody of economic theory, especially welfare economics and the categories of pathologies of inefficiency commonly studied in that area of specialization. According to this view, Coase begins by describing the world as characterized by economic theory. This world, to his regret, is a world in which transaction costs are not acknowledged. The absence of transaction costs in the welfare economics of 1960 creates an inconsistency: Economists talk about inefficiency in resource use due to externalities, public goods, and monopolies; yet, in the absence of transaction costs, none of those pathologies could persist. Inefficiency means, among other things, that potential mutually beneficial gains from exchange are not being realized. In the absence of transaction costs, people will make the relevant mutually beneficial exchanges and the pathology will disappear. Since transaction costs are not even acknowledged in the theory, let alone adequately integrated into it, economists cannot explain why the pathologies that they had taken such great pains to characterize might exist other than for brief periods of time. And if they half-heartedly acknowledge that transaction costs may prevent these gains from exchange from being realized, they are still stuck, because if transaction costs are real opportunity costs, then they can no more be a source of inefficiency than can the opportunity cost of any more commonly recognized factor of production.

Eugene Silberberg's (1978) discussion of the Coase theorem is the textbook treatment that comes closest to capturing the essence of the intended message of the first five sections of "The Problem of Social Cost."[3] Silberberg (1978: 494) clearly identifies the paradox in the new welfare economics that was the motivation for Coase's essay:

> The new welfare economics as outlined above is deficient in terms of incomplete specification and logical consistency. The fundamental

[3] McCloskey (1982: 353–56) presents a view comparable to that of Silberberg and clearly understands that the world of zero transactions costs is unreal. What matters, according to McCloskey's assessment, is the study of how to reduce transactions costs. Indeed, he defines the "Coase theorem" as follows: "In the presence of transactions costs the location of a pollution tax or of other liability for damages does matter for efficiency." This is what I call the "second real Coase theorem." I thank Jim Dorn for bringing McCloskey's work on this issue to my attention.

> postulates of economics are maintained throughout. Consumers are presumed to possess utility functions with the usual properties; i.e., they prefer more to less, convexity, etc. Most importantly, there are no costs of transacting or contracting between consumers in this analysis. Yet somehow consumers are supposed to get together and *not* exhaust the gains from trade in certain circumstances. But how can this be? If all consumers prefer more to less and there are no contracting costs, *Pareto optimality is necessarily implied*. To say otherwise is to deny the fundamental postulates of economics, most probably a premature stand to take. The only way the gains from exchange will not be fully exhausted is if consumers are somehow prevented from exhausting them by the existence of positive transaction costs.

Silberberg (1978: 494–95) goes on to explain:

> It is often claimed that "tariffs misallocate resources," urban areas are "overcrowded," the atmosphere and water supplies are "over-polluted," etc. It is less frequently asked why individual maximizers would ever do these things to each other. Indeed, in a world without transaction costs, they would not. All of which says that the enunciation of conditions under which the gains from trade will be exhausted under the assumption of zero transaction costs is apt to be a sterile endeavor.

The assumption of zero transaction costs is an assumption of the new welfare economics, not a new idea introduced by Coase in 1960. Sections III through V of Coase's 1960 essay do not tell a story about the real world. They tell a story about the hypothetical world of the new welfare economics.

The Real Coase Theorems

Section VI of "The Problem of Social Cost" opens with a statement that should have cast a long shadow of doubt on the canonical interpretation of the essay. The opening two sentences of this section are:

> The argument has proceeded up to this point on the assumption (explicit in sections III and IV and tacit in section V) that there were no costs involved in carrying out market transactions. This is, of course, a very unrealistic assumption.

According to Coase, the preceding discussion, which concluded that the initial assignment of ownership in a world devoid of costs of transacting had no impact on the equilibrium outcome, was not a discussion of the world as it is. Coase quickly goes on to reiterate his characterization of the nature of transaction costs and in doing so clearly indicates their pervasiveness in actual market transactions. So what has come to be called the "Coase theorem" was never intended to tell us anything about the way that the world actually works. The question "When does the Coase Theorem apply?" should always be answered "Never!" Transaction costs are ever with us. The world without transaction costs is the artificial world of perfect competition.

However, there is much more to the message of "The Problem of Social Cost" than the observation that economic theory has steadfastly ignored the existence of transaction costs. In section II of "Social Cost," Coase proposes to overturn the longstanding concept of harm based on causality and responsibility, and to replace it with a process that assigns liability for harm on the basis of cost-benefit analysis. In section VI of the essay, Coase articulates an economic theory of judicial and legislative action. These two sections discuss the *real* Coase theorems.[4] The ideas proposed are important claims about the way the world should work and, to some extent, about the way that the world does work. With a few exceptions, economists have largely ignored these propositions, which I shall call the first and second real Coase theorems.

First Real Coase Theorem

The first real Coase theorem can be stated as: *The harm recognized as a negative externality should be interpreted as reciprocal.* According to Coase, the traditional interpretation of the nature of the relationship between the polluter (the firm that releases smoke into the atmosphere) and the pollutee (the homeowner downwind) is that the polluter has harmed the pollutee. The intent of the Pigouvian tax was to make the polluter take into account the nature and magnitude of this harm. Coase ([1960] 1988: 96, 132) claims that this understanding of the relationship between the harmer and the harmed is incorrect:

[4] Coase states a number of propositions in "Social Cost." Whether any of these propositions constitute "theorems," or for that matter, whether the two propositions I have chosen to call the "*real* Coase theorems" are in fact theorems, I will leave for readers to judge. I have identified seven other substantial propositions in "Social Cost": (1) Many things economists perceive to be externalities are really legalized nuisances—Pigou did not do his homework on sparks from trains; (2) Economists have overemphasized marginal conditions at the expense of total conditions in their examinations of externality problems; (3) Common law is efficient, if maybe by accident; (4) What Coase calls "blackboard economics" is presumptuous; (5) The utilitarian theory of property rights is superior to the classical liberal theory; (6) Economists should think of factors of production as rights; and (7) Comparative institutional analysis is superior to the more popular comparison of real situations with idealized perfect situations, an approach Demsetz later called the "nirvana approach." It is beyond the scope of this article to examine these seven propositions.

> The traditional approach has tended to obscure the nature of the choice that has to be made. The question is normally thought of as one in which A inflicts harm on B and what has to be decided is, How should we restrain A? But this is wrong. We are dealing with a problem of a reciprocal nature. To avoid harm to B would be to inflict harm on A. The real question to be decided is, Should A be allowed to harm B or should B be allowed to harm A? The problem is to avoid the more serious harm. . . . What has to be decided is whether the gain from preventing the harm is greater than the loss which would be suffered elsewhere as a result of stopping the action which produced the harm.

Coase acknowledges that this view of the nature of the problem is a departure from that traditional law of nuisance and trespass.[5] Coase's view is a generalization of what is known as the Hand formula, which assigns liability for damages from an accident by comparing the costs of taking precautions that would prevent the accident with the probability of the accident occurring multiplied by the size of the loss incurred as a result of the accident (see Posner 1998: 180–83). If the cost of precaution is less than the expected loss from the accident, then the party for whom this condition holds is liable. Coase's generalization is to compare situations on the basis of the sum of the *market value* of all of the goods and services exchanged without the government action with the corresponding sum with government action to see if that action increased overall wealth.

Coase has claimed that his goal in writing "Social Cost" was to restructure microeconomics, but the first *real* Coase theorem really restructures justice—by confusing efficiency with justice.[6]

Second Real Coase Theorem

The second real Coase theorem is: *In a world with positive transaction costs, judicial activism or legislative action has the potential to increase efficiency by reallocating property to higher valued uses when transaction costs prevent this occurring through voluntary exchange.* Later in section VI, Coase ([1960] 1988: 16–17) proposes:

> It is clear that an alternative [i.e., an alternative to market exchange] form of economic organization which would achieve the same result at less cost than would be incurred by using the market would enable the value of production to be raised. . . . An alternative solution is direct government regulation. Instead of instituting a legal

[5] See Brubaker (1995) and Rothbard (1982) for economic treatments of the problem of negative externalities based on trespass and nuisance law that reject the Coasian approach.

[6] See Egger (1979), North (1992, 2002), and Block (1977, 2003) for discussions of the ethical implications of the first *real* Coase theorem.

> system of rights, which can be modified by transactions on the market, the government may impose regulations which state what people must or must not do and which have to be obeyed.

Contrary to Coase's reputation as an opponent of government intervention, this second theorem is an economic rationale for government regulation when there are significant transaction costs. Coase suggests that when transaction costs from private market exchanges are prohibitive, there is a potential efficiency enhancing role for government, a role that had not been previously identified in the welfare economics literature. Coase draws an analogy between government and the firm: they can both be means of economizing on transaction costs. In the case of the firm, transaction costs are avoided by setting up a system of contracts among owners of factors of production so that it is not necessary to purchase the services of those productive factors moment by moment through market exchange. Governments can reduce or even eliminate certain categories of transaction costs through regulation:

> It is clear that an alternative form of economic organization which would achieve the same result at less cost than would be incurred by using the market would enable the value of production to be raised. . . . An alternative solution is direct government regulation. Instead of instituting a legal system of rights which can be modified by transactions on the market, the government may impose regulations which state what people must or must not do and which have to be obeyed [Coase 1988: 16–17].

Corollary to the Second Real Coase Theorem

An important corollary to the second theorem is: *The second real Coase theorem should be applied with caution since actual judicial and state actions may make matters worse.* Coase is quick to point out, in Section VI of "Social Cost," that there is a limit to the extent to which the government can improve efficiency by avoiding transaction costs, just as there is a limit to the expansion of the boundaries of the firm. His analysis anticipates Wolf's (1979, 1988) theory of nonmarket or policy failure and much of the modern public choice theory. Coase reminds his reader that the use of government power to reduce transaction costs and to internalize external costs through regulation is subject to pathologies. Real people make policy decisions in government and they may not be guided solely by the mythical public interest when they do so. Much of the remaining discussion in "Social Cost" is devoted to an examination of how these pathologies have worked them out in particular cases, especially in the particular case of the train, the sparks, and the farmers discussed by Pigou.

Coase explains that the exemption from traditional standards for liability enjoyed by the railways in Britain was a product of legislative action. He suggests that this condition, which he calls "legalized nuisances" (Coase [1960] 1988: 127), accounts for a significant share of perceived external cost environmental problems. Thus, the possibility of using government regulation to reduce transaction costs and improve efficiency in internalizing external costs is a two-edged sword.

Criticism of the Real Coase Theorems

Once we recognize Coase's proposition about the reciprocal nature of harm as his first *real* theorem, a serious problem becomes apparent. He dismisses the traditional classical liberal theory of property rights and its related theory of ethics, but he offers nothing to convince his readers that his activist utilitarian theory is superior to the classical liberal theory that he rejects. He offers no well-defined theory of justice.

In his second *real* theorem, Coase offers an economic rationale for government intervention in the market process to achieve a more efficient outcome by lowering transactions costs. This intervention could be accomplished either by legislation or by the courts. Coase does not distinguish between legislative law and common law when he refers to the courts serving in this transaction cost economizing role. Bruce Benson (1990) and Hayek (1973, 1976, 1979) have explained the differences in both the historical origins of these two distinct sources of law. More recently Brubaker (1995), Yandle (1997), and Meiners and Yandle (1991) have shown that common law, traditionally dismissed by environmental economists as an inefficient means of environmental protection, has been more effective in addressing externality problems than economists have typically recognized. They have also argued that the potential exists to restore common law property rights to their previous effective role.

In theory, government can direct resources to their higher valued uses when voluntary exchange seems to get stuck. A critical weakness in this rationale for government intervention, however, is that it is silent on the question: "But how do they know?" How can judges or legislators know what the better pattern of resource use is in the absence of market prices? This issue is a variation on the challenge that Mises (1935) and Hayek (1935, 1945) made to proponents of central planning.

Omission of discussion of the implications of the economic calculation debate from Coase's exposition of his second *real* theorem is puzzling on two grounds. First, Coase (1988: 28–30) himself is critical of economists who do what he called "blackboard economics"—that is, drawing cost curves or supply and demand curves and implicitly assuming that they know the relevant relationships with sufficient empirical basis to identify different and superior equilibrium situations to recommend policy change. Coase was quite critical of this hubris. But he opens himself to this same criticism with his second *real* theorem. The second irony is that Coase was affiliated with the London School of Economics when the economic calculation debate was taking place and he made contributions to the literature on the subjective nature of opportunity costs, but he makes no connection between those ideas and his analysis in "Social Cost."[7]

Another criticism of Coase's case for government intervention in the case of externalities is that it creates dynamic incentive problems. Walter Block (1977, 2003) and Gary North (1992, 2002) have criticized Coase's proposal for the reallocation of property on many grounds, including these dynamic incentive effects. If owners of property know that some of their property might be taken by the courts or by the legislature if either a judge or legislators decided that that property was more valuable being used by someone else, then those current owners might exercise less careful stewardship over their property than would be the case if they knew that their consent was required before transfer of property would take place. Harold Demsetz, whose thinking is closely aligned with Coase, acknowledges this dynamic incentive effect problem (Demsetz 1979: 106–107), but fails to provide a satisfactory solution. He suggests that the rearrangement of property not be done too frequently, but offers no criteria to help us decide when rearrangement has become "too frequent."

To his credit, Coase is quick to point out that there are risks associated with the potential application of his second *real* theorem. Offering a public choice style perspective, he warns his readers that the regulators, "operating without any competitive check," might be captured by well-organized interest groups and act in a fashion contrary to the goal of social wealth maximization (Coase [1960] 1988: 118). He also acknowledges the problems of general regulations applied broadly that may not necessarily help matters in particular locations. And he suggests, like Buchanan and Stubblebine (1962) and Wolf (1979, 1988) were to argue later, that some problems are not worth fixing in the sense that the costs of the obtaining the solution would be greater than the benefits realized. But none of these warnings addresses the "But how would they know?" problem.

[7] On the subjective nature of cost, see Buchanan (1969).

What to Do?

If Pigou is wrong, because he ignored transaction costs and failed to investigate the institutional context of the problems he studied, and thus misdiagnosed the causes of externalities, and Coase's alternative isn't much better, because of the flawed idea of reciprocal harm and because his proposal for judicial and legislative intervention does not explain how the regulators can solve the economic calculation problem, what can economists contribute to the analysis of external costs? Too much of the discussion in contemporary environmental economics has pitted a Pigouvian view of the world against a Coaseian view, implicitly assuming that the discipline faced a choice between only these two competing alternatives. But, if you accept my argument to this point, neither the Pigouvian nor the Coasian path offers much promise.

Another option, however, exists—one that has not received sufficient attention. That option is embodied in contributions like Rothbard's (1982) "Law, Economics and Air Pollution," Barnett's (1992) "The Function of Several Property and Freedom of Contact," Brubaker's (1995) *Property Rights in Defense of Nature*, and Yandle's (1997) *Common Sense and Common Law for the Environment*. Taking neither the Pigouvian nor the Coaseian approach entirely, these economists have examined the origins of environmental conflicts and have studied the theoretical and practical aspects of using decentralized common law remedies to resolve those conflicts. This work has proceeded in a manner that takes the information issues identified in the economic calculation debate seriously. It has also addressed the informational and ethical problems of utilitarianism and has undertaken a comparative analysis of that ethical theory with classical liberalism and legal positivism—an analysis that sheds considerable light on the pitfalls of Coase's reciprocal theory of ethics.

Conclusion

The economics literature on "The Problem of Social Cost," for the most part, misses the point. The almost exclusive focus on whether Coase's claims about what happens in a world without transaction costs apply to the real world is irrelevant. Coase never claimed to be talking about the real world when he discussed the zero transaction cost case. He was actually criticizing what he saw as the conventional practice in economic theorizing. By limiting their attention to only one aspect of sections III through V of the essay, economists have diverted attention from the *real* Coase theorems and their limitations:

First, that harm should be seen as a reciprocal relationship and not in terms of the classical liberal view of causality and liability, and second, that judicial and legislative intervention in the ownership of property should be allowed, admittedly with caution, in the interest of improving efficiency.

It is time for economists and legal scholars to pay less attention to the traditional Coase theorem and more to the *real* Coase theorems. Coase is an insightful critic of the theory of perfect competition, a theory that he found to be logically conflicted and that has served as a poor guide for economists trying to understand the world around them. We need to engage him in his criticism of perfect competition. If his criticism is valid, then we have even more to change in the way that we go about our scholarly work. But we also need to engage Coase on the other substantive propositions that he has made, not only in "Social Cost" but elsewhere.

Coase has challenged us to devote more time to understanding the institutional structure within which market exchange takes place and to more fully integrate transaction costs into economic theory. Those are worthy goals. But in doing so, economists need to have a better appreciation of the classical theory of justice and property rights and need to incorporate the insights of Hayek and others regarding the problem of knowledge whenever government attempts to improve on market outcomes.

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