

IN MEMORIAM

The Power of Exchange

RONALD H. COASE 1910–2013

✦ BY PIERRE LEMIEUX

The number of tributes and comments that followed Ronald Coase's death last September 2nd has been staggering. By now, everybody interested in economics must know that Coase was a British-born economist who immigrated to the United States, won the 1991 Nobel Prize in Economics, and had much influence on the discipline. His work also generated much controversy. In tribute, I offer this overview and critique of his remarkable life's work.

ECONOMISTS AND ACCOUNTANTS

To most contemporary economists, Coase's earliest work would not seem very controversial, although his ideas likely would be controversial for non-economists.

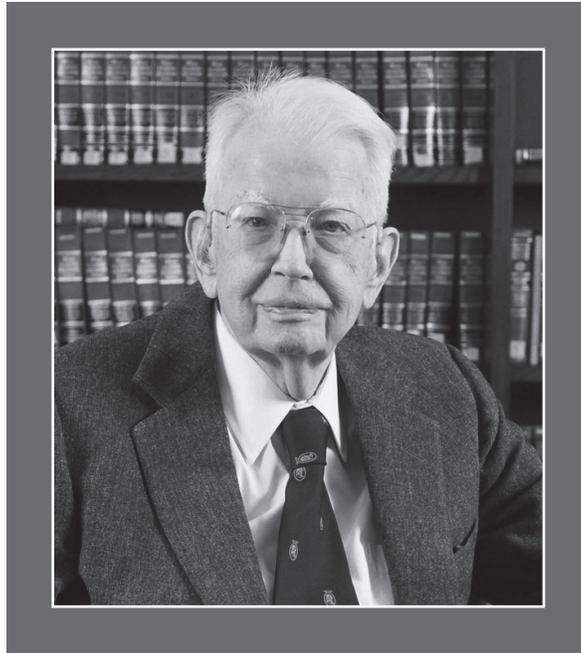
In a series of articles published in 1938, he tried to explain to accountants the notion of opportunity cost. The opportunity cost of a decision takes into account the lost benefits that would have been gained if an alternative decision had been made. For example, what is the cost to a firm of using materials it already purchased and has sitting in its stock? What was previously paid for purchasing the materials is irrelevant, since that cost is sunk (that is, in the past). The opportunity cost of using those materials in a specific job is what the firm foregoes from not using them that way or reselling them on the market, if either of those decisions would yield net receipts greater than the cur-

rent course of action. The materials' storage cost also must be considered, assuming the storage space could be used profitably in other ways. If the materials could not be used profitably for anything else, their opportunity cost is zero (minus any storage cost). Similarly, Coase would write in "Business Organization and the Accountant," the cost of using a machine "is the highest receipts that could be obtained by some alternative employment of the machine."

The basic idea behind opportunity cost is that what you choose *not* to earn is just as much a cost as any actual payments you make—a simple but crucial economic idea. It applies to all choices: in evaluating whether to buy a car and pay cash, you must consider not only the price of the car but the interest forgone that you would earn on that cash.

Opportunity cost is important because it is what businessmen and entrepreneurs use to reach their decisions. Choosing courses of action (e.g., which goods to be produced, in what quantities, which inputs to use) with the lowest opportunity costs amounts to maximizing profits, since this notion of cost already includes what could have been earned by choosing other courses of action: "To cover costs and to maximize profits are essentially two ways of expressing the same phenomenon," Coase wrote.

Nobel economics laureate James Buchanan, in his 1969 book *Cost and Choice*, presents Coase as one of the main theorists in the London School of Economics tradition on cost, explaining that opportunity cost is an *ex ante*, forward-looking concept, as opposed to the past, incurred, sunk costs that accountants fixate on. It should be understood that opportunity costs are subjective because forgone alternatives might have non-monetary costs and



because the future (when the gains from these opportunities would be realized) is fraught with uncertainty.

WHY THE FIRM?

One of Coase's seminal articles is his 1937 "The Nature of the Firm." Why, he asked, do business firms exist? Why is not all production organized by arm's-length contractors under the coordination of the market? That is, why does a car company hire people and organize factories to assemble cars, when a single individual could subcontract all parts of the work to other individual subcontractors on the open market? If the economic system automatically "works itself," as free-market economists used to say, why does the authoritarian firm exist within the free market? The question seems an obvious one, but it had not been clearly formulated before Coase.

His answer is that "there is a cost of using the price mechanism." This cost refers to what economists today refer to as "transaction costs." In the case of the firm, these are the costs of "discovering what the relevant prices are," "negotiating and concluding a separate contract for each exchange transaction," and forecasting uncertain future conditions. A firm, which realizes a "supersession of the price mechanism," is created when—given the specific circumstances of the case—these transaction costs are higher than the costs of organizing and managing the firm. Coase's theory explains why there is such a creature as the firm, "a system of relationships which comes into effect when the direction of resources is dependent on an entrepreneur." The theory also explains both why some firms get larger and why there isn't

a single large firm that produces everything. A firm will get larger as long as the savings on transaction costs (and other costs) are not overrun by the diminishing returns to management.

STIGLER: THE NON-PROBLEM OF SOCIAL COST

The notion of transaction costs was used again in another of Coase's seminal papers, "The Problem of Social Cost," published in 1960. The social cost of something is its opportunity cost in terms of lost production in the economy. In other words, a social cost exists when the value of total production in society is not maximized.

The paper generated much controversy, if only because there are two ways to interpret its main thrust. One way, which many economists adopted following George Stigler, can be summarized in the so-called "Coase theorem." In its extreme form, it amounts to saying that there is no problem of social cost: private parties would negotiate away any inefficiencies through voluntary transactions.

Before Coase, on these matters most economists accepted the treatment of "externalities" proposed by British economist A.C. Pigou. Externalities are costs or benefits that bypass the market and thus create a gap between private costs or benefits, on the one hand, and the corresponding social costs or benefits on the other. Pigou argued that the victims of negative externalities (such as pollution) should be compensated by those who generate them or that, alternatively, a tax should be imposed on the culprits to force them to take into account, in their business decisions, the damage caused to others. Such notions as an "emissions tax" to

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combat air pollution are modern versions of this old Pigovian idea. Whether the payment goes (in the case of the emissions tax) to environmental remediation or just to government does not matter; what matters is that the tax brings private cost in line with social cost so that private agents face the right incentives to minimize social cost.

Coase demonstrated that Pigou's principle is faulty from the point of view of economic efficiency—that is, of maximizing the value of production. What is important is for resources to flow to the uses that create the most value, which amounts to maximizing the value of production. The Coase theorem states that in the absence of transaction costs and if property rights are well-defined, the parties—polluter and polluted—will reach a bargain in which the one who creates the most value will bribe the other to stop interfering or to accept interference. Whatever the original distribution of property rights, such bargains will lead to the same efficient solution.

Consider a simple example: Assume that a factory produces a good that brings its owners \$1 million in profits per year, but that it pollutes a nearby hotel that, because of the pollution, annually loses \$2 million of its potential \$5 million profits. If the property rights to the air belong to the hotel, it will enjoin the factory to cease production and the factory will not be able to bribe the hotel to let it pollute since it could only pay a maximum of \$1 million while the hotel would require at least \$2 million to accept the pollution. Now, reverse the situation and assume that the factory owns the air surrounding the hotel. The hotel can persuade the factory to stop production (and pollution) with a payment of

operate would have created only \$4 million in value added (\$1 million created by the factory's operations and \$3 million by the pollution-handicapped hotel). Note that production can be measured by profits because profits correspond to the value added by the firm, and total production in the economy is calculated as the sum of all value added (to avoid double counting). Salaries are counted as the employees' own value added, for the simple reason that employees are not owned by the firm. Profits reflect the value created for consumers.

Other numbers with higher value creation by the factory or lower value creation by the hotel can give a different result—that is, the factory would be able to compensate the hotel or the hotel would be unable to pay the factory to stop production. More realistic cases would involve the factory or the hotel being able to move elsewhere, and the cost of moving would determine whether such a move would be profitable and who would move. But the conclusion would not change: whatever the initial allocation of property rights or—which amounts to the same—whatever the liability rule (is the factory liable or not for the damage it causes to the hotel's business?), bargaining between the self-interested parties will lead to the optimal solution in terms of the value of production. That value is calculated on the basis of consumer demand for the good of the factory and the services of the hotel. Exchange solves any problem of social cost.

It is important to understand a crucial part of Coase's argument: any externality is symmetric. The factory causes damage of \$2 million per year to the hotel in lost business profits, but if the hotel could force the factory to close, it would impose \$1 million of damage on the latter. What we have is a conflict over who will use a resource (the air around the factory and the hotel), and the proper solution is to allocate it in such a way that the value of production is maximized. More generally, according to Coase, the optimal amount of pollution is "the amount which will maximise the value of production." This solution will be reached automatically if property rights are well defined and there are no transaction costs.

A Pigou tax imposed on the factory and equal to the damage done to the hotel will not maximize production. Assume that the government calculates correctly that the damage done to the hotel is \$2 million a year, and imposes an equivalent tax on the factory if it continues polluting. To see that this solution—which, by the way, does not compensate the hotel owners or customers, but rather fills government coffers—does not necessarily maximize production, suppose that the hotel could move a few miles away for a supplementary operating cost of \$0.5 million per year. In our free-market set up, the hotel would move, whether it or the factory holds the property rights, because that is the cheapest way to deal with the pollution. There are no pollution damages if there is no factory nearby, but there are also no

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anywhere between \$1 million and \$2 million, which the factory will accept because it represents more than the net profits from continuing its operations. Remember from Coase's concept of opportunity cost that the forgone receipt of a pollution payment is just as much of a cost as making a pollution payment. Whatever the initial allocation of property rights, then, the same allocation of resources will finally prevail: the air will be used by the hotel for the benefits of its customers, and not by the factory for the benefits of the buyers of its goods.

It can be verified easily that this solution corresponds to the maximum value added (represented by profits) of \$5 million per year (going to the hotel), while the alternative where both firms

pollution damages, either, if there is no hotel nearby. After the move, the value of production would be \$5.5 million per year (a gain of \$0.5 million), split between \$1 million for the factory if it holds the property rights and \$4.5 million for the hotel, or if the hotel holds the property rights, between \$5 million for the hotel and \$0.5 million for the factory. Under a Pigou tax, the total value of production would be only \$5 million.

One counterintuitive implication is the following: If the polluter is charged a Pigovian tax equivalent to the damages it causes, the polluted should be simultaneously charged a tax equivalent to the damages its own presence generates—\$1 million a year in this case. This is because the presence of the hotel generates \$1 million of damage for the factory if the latter is forced to close. Externalities are symmetric and the incentives must be right on both sides.

MCCLOSKEY: TRANSACTION COSTS CAN BE A PROBLEM

There is another way of interpreting the Coase theorem, represented by, among others, Deirdre McCloskey of the University of Illinois at Chicago. “Something like a dozen people in the world understand that the ‘Coase’ theorem is not the Coase theorem,” writes McCloskey in her 1998 paper, “The So-Called Coase Theorem.” She points out that Coase himself was critical of the Coase theorem. For example, read Coase’s “Notes on the Problem of Social Cost”:

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.

“The missing factor” in mainstream economics, he added, “is the existence of transaction costs.” In another article, Coase even talked about “the infamous Coase theorem.”

Recall that transaction costs are the costs incurred by parties to a transaction to carry an exchange: the costs involved in finding the relevant partners, meeting, negotiating, signing a contract, monitoring performance, and enforcing the agreement. The problem is the following: when transaction costs are high enough to prevent exchange and mutually beneficial bargains—because, for example, there is a large number of indistinguishable polluters, or many polluted who can’t engage in collective action—the value of production will not be automatically maximized by the decentralized actions of the interested parties. In such cases, the market will not decide efficiently if more paper should be manufactured by a water-polluting pulp plant or if, on the contrary, swimmers and anglers should prevail because they value the river more. A correct

assignment of property rights and the exact nature of liability rules then become important. If polluters create the most value, the relevant property rights should be assigned to them; if the polluted attach more value to their own activities, they should be

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given property rights to the contested air or water. “[W]ith positive transaction costs,” Coase explained, “the law plays a crucial role in determining how resources are used.” It remains true that a Pigovian tax will not maximize the value of production, but laws are required to correctly assign property rights.

Coase was a professor in the University of Chicago Law School, not in the economics department. He made major contributions to the field that is now known as Law and Economics—the study of how economic forces shape the law, and vice-versa. His concept of transaction costs gave rise to the field of economic inquiry called Industrial Organization. He believed that not only the law but institutions in general are important. In his 1998 paper “The New Institutional Economics,” he argued that “the costs of exchange depend on the institutions of a country.” In his 1992 paper “The Institutional Structure of Production” (based on his 1991 Nobel lecture), he wrote that “without the appropriate institutions no market economy of any significance is possible.” He was a founder of the New Institutional Economics school of thought. For those crucial insights, “for his discovery and clarification of the significance of transaction costs and property rights for the institutional structure and functioning of the economy,” Coase received the Nobel Economics Prize.

A RECONCILIATION?

Can the two interpretations of the Coase theorem be reconciled? Perhaps. Coase himself provided some keys. “I tend to regard the Coase theorem,” he wrote in the 1992 paper, “as a stepping stone on the way to an analysis of an economy with positive transaction costs.” Government action may be required, but the best course of action can “be discovered not by studying imaginary governments but what real governments actually do.” His conclusion, he added, was to “study the world of positive transaction costs.”

His “Problem of Social Cost” paper is quite explicit that if the common law and perhaps statutes have to define property rights

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that can then be traded on the market, other government interventions in the form of regulation, taxes, or subsidies are generally unproductive. The problem, he reckoned, is that government is not checked by competition and resorts instead to “authoritarian methods” and the police. “[T]he governmental administration machine is not itself costless,” he explains, and as a consequence

it will no doubt be commonly the case that the gain which would come from regulating the actions which give rise to the harmful effects will be less than the costs involved in Government regulation. ... It is my belief that economists and policy-makers generally have tended to over-estimate the advantages which come from governmental regulation.

Coase seemed to believe, however, that each case had to be analyzed and judged on its own merits, which as Friedrich Hayek argued is a good recipe for continuous government encroachment. Yet, there is no doubt that Coase generally favored voluntary exchange and the free market. Even when he thought that intervention by the government or the courts was warranted, he argued, in the words of his 1959 paper “The Federal Communications Commission” that “the solution to be sought is that which would have been achieved if the institution of private property and the pricing mechanism were working well.”

The simplest way to interpret his work is that more market—that is, more exchange and more choice—is better than less.

In the 1959 paper, he recommended that frequencies on the electromagnetic spectrum be auctioned off to the highest bidder, instead of being allocated by a bureaucratic command-and-control system or through lobby-laden politics and rent-seeking. He explained that the scarcity of the electromagnetic spectrum does not justify public property more than the scarcity of paper would call for the government to allocate it to newspapers and publishers. The basic idea is the same as in the Coase theorem: if property rights are well defined, the users who can create the most value will end up purchasing the frequencies. If a specific wavelength belonging to you is more valuable to my customers than to yours, I will offer you more money than you can expect to make in profits and you will sell. It took a quarter of a century for this revolutionary idea to start being implemented through spectrum auctions—and then only a very incomplete way. (See “Getting Away from GOSPLAN,” p. 14.)

Is this type of government intervention even required? Whatever we answer to this question, Coase’s approach to the problem was a breath of fresh air. Nearly everybody thought that the electromagnetic spectrum had to be owned and managed by the state—quite a phenomenon in a country supposedly based on free enterprise. In fact, Coase argued that the creation of the Federal Communications Commission in 1927 had actually prevented the courts from delimiting private property rights.

In another famous article, 1974’s “The Lighthouse in Economics,” Coase showed that British lighthouses, a standard example of public goods that allegedly need to be produced by government,

were in fact built, operated, and owned (through long-term leases) mainly by private entrepreneurs until the 19th century. From Henry Sidgwick to Paul Samuelson through Pigou, most economists had simply assumed that government ownership and operation of lighthouses was, and had always been, the only possible formula. Coase’s careful study of the history of the British lighthouse system proved that this need not be the case. In 1820, three-fourths of British lighthouses had been originally built by private individual entrepreneurs. “The tolls were collected at the ports by agents (who might act for several lighthouses), who might be private individuals but were commonly customs officials.” The lighthouses, then, were not completely private ventures, but they were for a time more private than public. By 1842, all private lighthouses had been purchased by a public body—in fact, nationalized.

In 2013, at age 101, Ronald Coase published with Ning Wang of Arizona State University a new book, *How China Became Capitalist*. The book analyzes how China’s extraordinary economic development over the past three decades was realized more despite government intervention than because of it. In a typical Coasian perspective, the book reminds us that the market depends on a broader institutional background that includes the rule of law and property rights. After Mao’s death, the Chinese legal system started to be rebuilt, tapping into a market culture that had existed in China for thousands of years. Coase and Wang note that property rights were delineated when the authorities released controls on resources in favor of specific private individuals or businesses. After three decades of reform, a large part of the Chinese economy had been privatized, with the notable exception of some state corporations. This may not be real capitalism—just as Western countries are themselves a mix of capitalism and socialism—but it is better than wall-to-wall socialism. (See “Getting Rich Is Glorious,” Winter 2012–2013.)

THE STATE OF ECONOMICS

Methodologically, Coase is a neoclassical economist, but his emphasis on subjectivism and the real world, his attack on “mainstream economics,” his theory of information, and his shunning of mathematics should have won him friends among the Austrians.

His concept of opportunity cost is deeply subjectivist, as Buchanan duly noted in *Cost and Choice*. “The opportunity cost concept developed at [the London School of Economics],” Coase wrote in his 1990 paper “Accounting and the Theory of the Firm,” “was no doubt influenced by Hayek who would have added an Austrian flavour.”

Coase’s emphasis on the problem of information is reminiscent of Hayek’s theory of knowledge. Accountants have no access to the subjective evaluations that would be necessary to calculate a proper opportunity cost. Government cannot possess the information on cost and demand that would make a Pigovian tax feasible. As he wrote in “Notes on the Problem of Social

Cost,” “such tax proposals are the stuff that dreams are made for.”

Coase was highly critical of mainstream economic theory, which he thought had become too abstract, a sort of “blackboard economics” divorced from “how the real economic system works.” He attacked the definition of economics as a method of analysis based on a theory of choice and argued for a more restrictive and practical definition as “the study of the working of the economic system, a system in which we earn and spend our incomes.” Economics, he claimed, has moved from a study of the economy to mere price theory and “a hard science of choice.” It is not concerned with “the study of man as he is and the economic system as it actually exists.” Far from “enlightenment about how the economy operates,” he wrote in his 2012 essay “Saving Economics from the Economists,” economics has become “a convenient tool

mathematician J. Willard Gibbs: “Mathematics is a language”—nothing more, nothing less. Whatever the usefulness of this language in economics, Coase was a master at using another language, English, to explain things that could hardly be better explained with mathematics.

WELFARE AND POLITICS

Any delineation of property rights by whatever mechanism implies a certain distribution of wealth. Coase sometimes admitted that a redefinition of property rights by the courts (or the government) would affect the distribution of wealth. Whose wealth and welfare should be privileged? In the 1879 case of *Sturges v. Bridgman*, the court ruled in favor of a physician who had

sued a confectioner for making too much noise on a contiguous property used for that purpose *before* the doctor had bought his own property. Some may object to this allocation of property rights on moral grounds, but the objection brings one outside the domain of economics.

Coase seemed to agree with Frank Knight and modern welfare economists that such problems of distribution ultimately require value judgements; they “dissolve into a study of aesthetics and morals,”

wrote Coase in “The Problem of Social Cost.” He was not really interested in distribution issues, being content with any allocation of rights that would maximize the value of production. He did not have a clear theory of welfare and, anyway, his Marshallian, partial-equilibrium framework was not capable of treating the issues raised by welfare economists.

Coase’s theory of the state was also underdeveloped. One may criticize his idea of analyzing each case of government intervention on its own merits, an approach that suggests a still-too-naïve trust toward Leviathan. But perhaps he may be forgiven, as his first analyses predate public choice theory. Or perhaps this is, with welfare economics, another case where his crude empiricism ran away too far from theory and “blackboard economics.”

In “The Institutional Structure of Production,” he wrote, “My contribution to economics has been to urge the inclusion in our analysis of features of the economic system so obvious that, like the postman in G. K. Chesterton’s *Father Brown* tale, ‘The Invisible Man,’ they have tended to be overlooked.” He did that and more. He clearly defined the crucial concept of opportunity cost. He invented the concept of transactions cost. He brought in sharp focus the importance of social institutions, including legal institutions. He pushed economists to take these notions seriously in their theories and observations.

Time will tell if Coase’s contributions change economics as much as he hoped they would, but there is no question that he was one of the major economists of the 20th century. R

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the state uses to manage the economy.” His New Institutional Economics aimed to bring economics closer to “the real world” where legal, political, social, and cultural institutions influence transaction costs, production, and exchange.

Coase shunned the use of mathematics in economic analysis, except for a few rare and very simple diagrams. He wrote in “The New Institutional Economics,”

In my youth it was said that what was too silly to be said may be sung. In modern economics it may be put in mathematics.

His rejection of mathematics, however, was not a matter of principle. In “The Institutional Structure of Production,” he explains this in a way that is perhaps not immune to a certain naïve optimism:

My remarks have sometimes been interpreted as implying that I am hostile to the mathematization of economic theory. This is untrue. Indeed, once we begin to uncover the real factors affecting the performance of the economic system, the complicated interrelations between them will clearly necessitate a mathematical treatment, as in the natural sciences, and economists like myself, who write in prose, will take their bow. May this period soon come.

Coase rightly criticized Paul Samuelson for his tendency to neglect the power of self-interest and exchange, and to overestimate the wisdom of the state. Yet, it is Samuelson who quoted