

Chapter 7

Problems of Monopoly

No Government could distinguish in any detail between the varying tastes of individual consumers... without a pricing system, a most useful guide to what consumers' preferences really are would be lacking; furthermore, although a pricing system puts additional marketing costs on to consumers and firms, these may in fact be less than the organising costs which would otherwise have to be incurred by the Government.

—Coase (1946), p. 172

An interesting and thorny question in the economic organization of production is monopoly, that is, when a single firm produces all output sold in a market. Coase analyzed two different monopoly questions: how should public utilities price their output, and how should a monopolist that produces a durable good price it?

The marginal cost controversy and public utility pricing

Industries, like railways, electricity, and telecommunications, have characteristics that lead to difficult economic questions and challenging analyses. In such industries, production costs are skewed heavily toward capital, or fixed costs, with variable costs being a small share of total costs. In these high fixed-cost industries, the average production cost per unit of output declines as a firm's output increases, at least over the quantity or amount of product that consumers want to buy ("over the relevant range of demand"). That cost structure means that the marginal cost of a unit of that company's product is lower than its average cost over this significant range of output. Companies structured this way are called "decreasing-cost." If firms in a decreasing-cost industry compete in a typical market process, their rivalry would drive the

price of their product down to its marginal cost, because if the market price is the same as a firm's marginal cost it can still pay its variable costs like wages. But if the price they receive is equal to marginal cost and this is a decreasing-cost industry, the market price will be lower than average cost, which will lead to losses. If marginal cost is not the right way to price goods in a decreasing-cost industry, how should prices be determined?

Early in his career Coase entered a lively debate over prices in decreasing-cost industries. In 1938 Harold Hotelling published an argument in favour of marginal cost pricing on efficiency grounds, based on the general argument that social welfare is maximized where marginal benefit equals marginal cost. For that reason, Hotelling argued, these firms should charge consumers a price equal to marginal cost and receive taxpayer-funded subsidies to cover their fixed costs (which, again, are considerable). Hotelling relied on taxation theories to suggest lump-sum taxes on consumers that, in aggregate, would pay for fixed costs.

In 1946 Coase's analysis of Hotelling's proposal, "The Marginal Cost Controversy," clarified the question and gave the debate its name. (Frischmann and Hogendorn (2015) provide an excellent summary of the marginal cost controversy debate and the lasting relevance of Coase's argument today.) While acknowledging the efficiencies inherent in marginal cost pricing, Coase argued that imposing lump-sum taxes to pay for firms' fixed costs would not actually result in the most efficient outcome. Coase distilled the problem down to three essential parts:

- 1) The divergence between marginal cost and average cost, with marginal cost lower than average cost;
- 2) The allocation of common costs across consumers;
- 3) That many fixed costs are pre-payments on long-term contracts for inputs that could be considered variable costs.

While the divergence between marginal and average cost is the predominant analytical issue, the other two are tricky. When there is a common fixed cost that must be shared across consumers, economic theory does not suggest a single, clear, definitive method of doing so. In electricity, for example, much

of the capital in the distribution system creates a shared network that different consumers use to different degrees (and at different times of day). How should the costs be apportioned among these different consumers, particularly at the time Coase was writing, when digital technologies did not exist to enable precise measurement of use of the distribution grid? This question of the apportioning of common costs remains relevant in regulated electric utility rate design.

To examine Hotelling's question Coase set up a simplified conceptual model, using a style of analysis common to all of his major works. He argued that while price would equal marginal cost, resource misallocation would still arise because neither producers nor consumers would take fixed costs into account in making production and consumption decisions. In other words, if fixed costs were paid for through taxes or subsidies, neither producers nor consumers would have any incentive to consider the opportunity cost of those resources.

Coase also argued that in the absence of a market price that reflected opportunity costs, there would be no institutional framework, no market process, for learning whether or not consumers were willing to pay the full cost of the output they consumed; this observation overlaps with the challenge of allocating common costs across consumers. Finally, Coase observed that in Hotelling's system the redistribution of wealth from people who used only a little of the product in question to those who used a lot of it would be almost unavoidable. Wealth redistribution would also arise from the mismatch between consumers and taxpayers—not all consumers of the firm's output would necessarily be taxpayers, and vice versa.

Rather than accepting Hotelling's static analysis of an already-existing decreasing-cost firm, Coase performed a dynamic analysis of the broader incentives of Hotelling's proposal and the realistic institutional framework that would be required to implement it. How would the government determine consumer demand to learn consumer preferences, to make sure that the right amount and type of fixed costs were incurred? In his emphasis on government ability to acquire knowledge, government performance, and the assumption of government as neutral public servants, Coase makes points that presage the later developments of public choice economics in the 1950s and 1960s.

Coase made an alternative proposal to Hotelling's: multi-part pricing. While he did not provide specifics in his 1946 article, his idea was to have the price include a component that reflected the marginal cost and a component that allocated the fixed cost, subject to the constraint that the firm does not earn losses; this example is called a two-part tariff. Such pricing incorporates all costs into the prices to which producers and consumers respond, and does not involve either the funding problems or institutional incentive problems that Coase identified with the tax/subsidy proposal. Multi-part pricing does not avoid the problem of allocating common costs across consumers, and such allocation will also be the province of estimates and be prone to bureaucratic manipulation, but it may be the best we can do given realistic assumptions about our constraints and the limitations of our knowledge.

Coase's analytical framework for decreasing-cost industries persists to this day in the form of regulated rate setting in the electricity and natural gas distribution industries. If you look at your electric bill you will see a variable "energy charge," reflecting marginal cost, and a "wires charge" or "carrying charge," that allocates a share of the fixed costs of constructing, maintaining, and operating the distribution network. At least in theory, regulated rate setting is grounded in Coase's logic.

Coase and his interlocutor William Vickrey remained interested in the marginal cost controversy questions through 1970, and the ideas in that debate informed Coase's work on the related question of public utility pricing. Utilities such as telephone, electricity, and natural gas have traditionally had the high fixed costs that had been the focus of the marginal cost controversy analyses. Coase (1970) revisited his earlier analysis and applied his approach to the Federal Communications Commission ruling that allowed competitive entry in the microwave band of the radio spectrum. This decision created a new option for businesses: they could invest in their own microwave communications system or use AT&T's new Telpak microwave band service.

In this articulation of his argument Coase made the economic logic even clearer:

A consumer does not only have to decide whether to consume additional units of the product. He also has to decide whether it is worth

his while to consume the product at all rather than spend his money in some other direction. This can be discovered if the consumer is asked to pay an amount equal to the total costs of supplying him....

Apparently what the advocates of marginal cost pricing had in mind was that the Government should estimate for each consumer whether he would be willing to pay a sum of money which would cover the total cost. However, if it is decided that the consumer would have been willing to pay a sum of money equal to the total cost, then—and this strikes me as a very paradoxical feature of this argument—he will not be asked to do so. So the Government would estimate whether a consumer would be willing to pay, and if he is willing to pay, it does not charge him.

I found this a very odd feature. But I do not see how it would be possible for any government, or anyone else for that matter, to make accurate estimates at low cost and without knowledge of what would have happened if consumers had been required to pay the cost. The way we discover whether people are willing to pay something is to ask them to pay it, and if we do not have such a system, it becomes extremely difficult to make estimates of whether they would be willing to pay....

But, of course, such estimates, if made, would in practice be very expensive, and they would be inaccurate, and much waste of resources would result from the kind of procedure envisaged by the advocates of marginal cost pricing. (1970: 118)

In addition to reiterating that efficiency entails consideration of both marginal cost and total cost, Coase makes a transaction cost argument—that attempting a government survey to elicit consumer preferences is costly. Designing and implementing such a survey would be an expensive venture, and those transaction costs have to be considered when choosing a utility pricing scheme. Earlier work from Hotelling and others assumed that those transaction

costs would be zero. This point bolsters Coase’s epistemic argument that governments cannot aggregate the knowledge required to estimate fixed costs in the absence of a decentralized price system (an insight similar to Hayek’s (1945) argument about the role of the price system).

Durable goods monopoly

One of Coase’s most theoretical and abstract works, “Durability and Monopoly” (1972), starts by posing yet another deceptively simple question: “Assume that a supplier owns the total stock of a completely durable good. At what price will he sell it?” (1972: 143) If the good is completely durable (i.e., does not depreciate) and no other supplies and suppliers exist, the profit-maximizing monopolist will charge the competitive price (price = marginal cost), a provocative claim that is known as the Coase Conjecture. The logic of Coase’s argument is

- 1) Having sold the quantity where marginal revenue equals marginal cost, the monopolist can earn additional profit by selling additional units at a lower price. They can charge a lower price on later units sold and still profit because they do not have to lower the price on the earlier units that were already sold.
- 2) Consumers have the rational expectation that this price decrease will occur in the future, and will hold off purchasing at the earlier, higher price.
- 3) If the monopolist can change prices quickly, the initial price will be marginal cost.

In essence, the monopolist supplier is competing with its future selves. That intertemporal competition prevents the monopolist from exercising market power to raise prices today. A profit-maximizing monopolist today sells the “monopoly quantity”—that is, a quantity less than would be sold if the seller had no monopoly power—but then has strong incentives to sell more in the future, which requires lowering the price.

How could the monopolist avoid this outcome and maintain a higher price? Coase suggested leasing the good rather than selling it. A consumer can cancel a lease and then sign a new one if the price is lower, which imposes

pricing discipline on the monopolist. He also suggested making the good less durable, or in other words, planned obsolescence. Another option is a money-back guarantee, which creates a disincentive to lower the price. Credible pre-commitment to a future production schedule could also attenuate the incentive to reduce the price.

The Coase Conjecture has generated a large literature that formalizes the theory and applies it to durable goods markets. Much of this work is game-theoretic in nature, which makes sense — the core of Coase’s logic is backward induction, or reasoning backward to determine a sequence of optimal actions. The intertemporal strategic interaction among the monopolist and its future selves is a good example of how the monopoly maximizes its profits at each separate decision stage, working backward from the end to today, to determine the sequence of optimal pricing decisions over time. Deneckere and Liang (2008) and the research they cite provide good examples of this literature expanding on the Coase Conjecture.

In both the decreasing-cost industry question and the durable goods question, Coase’s analysis of the implications of monopoly deepened our understanding of those implications. The static monopoly model, with its naïve presumption that a monopolist would charge a high price, did not explain the actual experience of pricing observed in these markets. Coase’s work helps us understand why, and has led to further research to deepen and extend that understanding.