Contestable Markets: An Uprising in the Theory of Industry Structure: Comment

By Martin L. Weitzman*

A situation traditionally identified as conducive to imperfect competition is when average costs decline and the cheapest scale of production is large relative to the size of the market. However, some of the more recent literature on industrial organization has emphasized a supposed distinction between *fixed* costs of production and *sunk* costs of production. A point frequently made is that while the possibility of sunk costs can create genuine barriers to entry, pure fixed costs per se do not inhibit competitive market performance. This approach finds its logical extreme in the norm or abstraction of "perfect contestability."

Perfect contestability is *essentially* a theory of the polar case of frictionless entry and exit. As William Baumol stated, "a contestable market is one into which entry is absolutely free and exit is absolutely costless" (p. 3). Certainly this is the most reasonable interpretation of a situation where potential entrants feel free to disregard an incumbent's price response.

Suppose every potential and actual producer has access to the same technology. In a perfectly contestable market, there are no set-up or shut-down losses. The main result is that even with declining average costs of production, the incumbent firm does not dare to post a price higher than average cost. Price above cost invites being undercut by a hit-and-run shadow entrant capable of producing at the same flow rate and at identical unit cost during just the briefest instant of time.

I argue that this line of reasoning is misleading. Perfect contestability gets around the problem of increasing returns only by, in effect, assuming it away. A hit-and-run technology makes the firm behave "as if" it is competitive in a market precisely because the convexity preconditions for competition are de facto being met in that market.

This comment shows that, strictly speaking, there is no such thing as a "pure" fixed cost. Unless there are sunk costs located somewhere in the relevant production technology, all costs are variable. As a matter of formal theory, you cannot have a range of decreasing average cost without sunk costs. Presumably there is also an approximation theorem which states that when sunk costs are "close" to being negligible then average production costs are "practically" nondecreasing. Perfect contestability holds approximately in a market only to the extent that production costs for the market are approximately nondecreasing.

My discussion will be restricted to the familiar case of a single, well-defined, homogeneous, fully divisible commodity. While more general approaches are possible, for the sake of simplicity the following definition is used.

The average cost function $AC(y, t)$ describes, say, the minimum cost per unit of output produced at a uniform flow rate y throughout the time interval $(0, t]$. Especially in applications to industrial organization theory it is essential to remember that cost functions are not generally timeless, and that writing AC as a function of y alone can be dangerously vague.

Behind the free entry and exit of a hit-and-run technology in a perfectly contestable market is the abstraction of no sunk costs—investments are fully reversible because nothing is lost in setting up or shutting down production.

DEFINITION: *There are no sunk costs whenever there is some function $f(y)$ with $f(0) = 0$ such that for all y and t, $AC(y, t) = f(y)$.*

It might be conjectured that the absence of sunk costs does not preclude a declining

*Massachusetts Institute of Technology

section of the average cost curve. However, the following result shows that declining costs are not compatible with a timeless cost function.

THEOREM: *If there are no sunk costs, the average cost function is nondecreasing over its entire range.*

PROOF:

Let $y < y'$. Pick any $t > 0$. Let $i = 1, 2, \ldots, n$. Consider the following production schedule. Throughout the time interval,

$$((i-1)t/n, (i-1)t/n + (y/y')t/n],$$

output is produced at flow rate y'. Throughout the time interval,

$$((i-1)t/n + (y/y')t/n, it/n],$$

output is produced at flow rate 0.

In the limit as n is large, the production flow rate is uniformly y throughout any subinterval of $(0, t]$. The cost per unit of output produced by this limiting schedule is $f(y')$. But then $f(y) \leqslant f(y')$.

My conclusion is that contestability cannot serve as a useful focal point for a general theory of market forms because it is meaningless to simultaneously postulate the presence of fixed costs and the absence of sunk costs, at least for any well-defined situation lending itself to the usual cost function approach. In the limit, as the concept of contestability is pushed hard, a hit-and-run technology cannot be other than convex.

REFERENCE

Baumol, William J., "Contestable Markets: An Uprising in the Theory of Industrial Structure," *American Economic Review*, March 1982, *72*, 1–15.