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# The Law of *n*+1

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In economics, the traditional way of viewing businesses and products has been to regard the firm as a multiproduct enterprise. The firm produces *n* different products and earns a different price-cost margin on each, depending on the firm's own-price elasticity of demand for each. William Baumol and Daniel Swanson argued that competing multiproduct firms are compelled to engage in price discrimination.[1] Actually, Baumol and Swanson make the point with respect to separate classes of consumers for a *single* product, which analytically resembles the multiproduct situation, with the exception that economies of scope do not necessarily figure in the analysis.[2] The implicit assumption is that the firm produces a well-defined, mature product with which consumers are very familiar.

The Internet's maturation as a popular platform for commerce has created a new range of business models based on greater economies of scale in distribution, lower search costs, higher returns to buyers' investment in search, more product differentiation, and lower barriers to entry for the production or sale of many products. The Internet has made possible

* Chairman, Criterion Economics, Washington, D.C. Email: jgsidak@criterioneconomics.com. I wrote this essay in about 2010 and left it in a drawer for years, wondering whether my point was trivial. After another decade of antitrust adventures in high-tech industries, I came to suspect that my message had not already become entirely obvious. I thank Henry Brooke, Tad Lipsky, Douglas Maggs, Giovanna Massarotto, Urška Petrovčič, Blount Stewart, and Andrew Vassallo for their helpful comments, which of course do not imply that any of them endorses the views expressed here. No client or third party has commissioned or funded or exercised editorial control over this essay. The views expressed here are solely my own. 

[1] William J. Baumol & Daniel G. Swanson, *The New Economy and Ubiquitous* Competitive *Price Discrimination: Identifying Defensible Criteria of Market Power*, 70 ANTITRUST L.J. 661 (2003).

[2] A firm's technology is said to exhibit economies of scope if a single firm can produce two products at a lower cost than if each product were produced by a different firm. *See, e.g.*, J. GREGORY SIDAK & DANIEL F. SPULBER, DEREGULATORY TAKINGS AND THE REGULATORY CONTRACT: THE COMPETITIVE TRANSFORMATION OF NETWORK INDUSTRIES IN THE UNITED STATES 55–60 (Cambridge Univ. Press 1997); DANIEL F. SPULBER, REGULATION AND MARKETS 114–17 (MIT Press 1989); WILLIAM J. BAUMOL, JOHN C. PANZAR & ROBERT D. WILLIG, CONTESTABLE MARKETS AND THE THEORY OF INDUSTRY STRUCTURE 71 (Harcourt Brace Jovanovich rev. ed. 1988) (1982). The seminal exposition of economies of scope is John C. Panzar & Robert D. Willig, *Economies of Scale in Multi-Output Production*, 91 Q.J. ECON. 481 (1977).

both virtual international retailers like Amazon and advertising-supported consumer products like Google search or Facebook social networking. The products that the Internet makes possible are inherently multi-sided because of the intensity of, and the payoffs to, finely granulated search that brings producers in touch with intense demanders of a product. Consequently, the margin between price and marginal cost for any one of these products can be enormous. That relationship is especially the case because the demand for search-based advertising is so huge.

These conditions ensure a collision of business models. An Internet business that derives advertising revenue decides to offer a service that traditionally has been supplied by a multiproduct firm, such as voice telephony or video delivery. These products can be replicated with applications that use Internet protocol (IP) to ride over the preexisting infrastructure of the Internet and its reticulated access networks. The cherry picking of the multiproduct firm's valuable products or consumers thus begins, but it proceeds on an unparalleled scale and with an objective that might strike traditional firms as utterly inscrutable.

When confronted by that cherry picking, the old multiproduct firm finds that it cannot earn any margin on one or more of its traditionally lucrative services. To the contrary, the product that previously generated significant contributions to the recovery of common costs might now be expressly priced at zero—or, even more disruptively, *below* zero. In other words, demand for the $n^{th}$ product of the old multiproduct firm plummets because the Internet firm is now supplying a substitute version of product $n$ that is subsidized by some entirely new and ancillary revenue stream. Because of demand complementarities, some economic actor might actually pay consumers to consume the new Internet version of the familiar product $n$. The ancillary revenue stream that supplies the reservoir for funding the requisite subsidy arises from the value created by the demand-side and production-side economies of scale of the Internet.[3] For the Internet firm, the output of the traditional multiproduct firm is now effectively an input to the production of a new and different product.

Earlier strategies of entry would have counseled the entrant to strive to produce product $n$ using the same, or better, technology and merely undercut the incumbent's margin on this service, which traditionally had made a disproportionate contribution to the recovery of the common costs of the multiproduct firm.[4] The disruptive force of the Internet firm, however, is of an entirely different order. It is not engaging in mere price chiseling on

[3] I use the now-familiar but colloquial phrase "demand-side economies of scale" with reluctance, for the extraordinary value being created on the demand side obviously does not relate to any cost function, which is where one would ordinarily observe economies of scale.

[4] *See* William J. Baumol & David F. Bradford, *Optimal Departures from Marginal Cost Pricing*, 60 Am. Econ. Rev. 265 (1970).

the margin or regulatory arbitrage. The Internet firm is instead destroying the viability of the preexisting business model because it is tapping into an entirely new and ancillary revenue stream that is funded by a set of economic actors *other than* the end-users of product ***n***.

It is well understood that a new entrant might face initial periods of losses. However, the situation presented here by the Internet firm transcends that insight. The new entrant might choose a business model that redefines the products and revenues from an interrelated set of goods and services, such that the stream of "profits" from any one of those products remains negative even in the long run.

How does the traditional multiproduct firm compete—*how does it survive*—when confronted by this new, alien form of rivalry? Why does the *Wall Street Journal* appear free of charge on my driveway? The Baumol-Swanson analysis suggests, at a minimum, that competition will force the multiproduct firm to respond by revising the vector of prices that it charges for its ***n*** products. Baumol-Swanson competitive price discrimination of course is not identical to Ramsey pricing.[5] The revised vector of prices that emerges from the Baumol-Swanson insight is merely the *loss-minimizing* vector of prices. It is no longer certain that the firm can break even in the sense of earning no more than a competitive, risk-adjusted return to capital on the overall sale of its ***n*** products.

One reaction is for the traditional firm to cry foul. It can try to invoke antitrust law or regulation to repel the Internet company's version of product ***n***, or at least prevent any future products of that ilk from gaining entry into other mature product markets. The regulatory question (illustrated by the now-quaint debate over whether voice-over-Internet-protocol (VoIP) is a "telecommunications service" or an "information service") will depend on agency or judicial interpretation of statutory language. That language will likely be of no practical help whatsoever. By definition, the disruptive new Internet version of product ***n*** was never envisioned by business executives—let alone legislators—when the statute was drafted and enacted. If the disruptive technology or business model had been anticipated in statutory language, the disruption would not be disruptive. The regulatory agency is likely to side, initially at least, with the defender of the status quo because the antitrust enforcer or regulator, as the shepherd of the industry, does not like to see one of its sheep being devoured by a wolf. The courts might be different. The history of the Bell System would be very different had the U.S. Court of Appeals for the D.C. Circuit not decided to commence the deregulation of long-distance telephone service over the FCC's protestations.[6]

[5] Frank P. Ramsey, *A Contribution to the Theory of Taxation*, 37 Econ. J. 47 (1927).

[6] *See* Michael K. Kellogg, John Thorne & Peter W. Huber, Federal Telecommunications Law § 9.3 (Aspen 2d ed. 1999).

The antitrust scenario is even more paradigm-shattering. The Internet firm is pricing its version of product *n* below cost. It looks like an antitrust predator. Yet the supposed predator is the *entrant*—not the incumbent engaged in the familiar defense of a high market share, supposedly protected by barriers to entry. There is a complete reversal of roles.

Existing antitrust precedent cannot fathom this situation. Until the Supreme Court's *American Express* decision in 2018,[7] American courts would tie themselves up in knots whenever a two-sided market or ancillary revenue stream was present. Even now, antitrust jurisprudence poorly comprehends competition among multiproduct firms, where complementarity of demand among products within a basket influences the nature of competitive rivalry among firms. Witness, for example, the difficulty of prosecutorial and judicial analysis in cases involving product integration, bundled rebates, or terms of access to proprietary facilities or intellectual property. A case like *Aspen Skiing* is so much easier to comprehend if one recognizes that the opportunity cost of selling access to a ski slope to a competitor at the retail price is the forgone ancillary net revenues (on sales of refreshments, for example).[8] Price-squeeze or margin-squeeze cases decided before *linkLine* in the United States (and still being decided in most of the rest of the world) exhibit the same myopia of pricing within a multiproduct firm.[9] All of this is to say that, under a naïve application of antitrust principles, the Internet firm's product innovation would, perversely, carry some risk of antitrust liability if the firm had market power.

What, then, can the traditional firm do? It would appear that its only recourse is to integrate into the same advertiser-based business model as the Internet firm. The traditional firm's old business model, and the pricing rules that emerged from it, are no longer sustainable. The traditional multiproduct firm that was producing *n* products must now produce *n*+1 products. This is "the law of *n*+1." Vertical integration into advertiser-supported products is a necessary condition for the firm's survival. Of course, one variant of this strategy is to acquire, or merge with, the Internet firm that has upended the viability of the old business model. It certainly would not be possible for the traditional firm to suppress the new business model after acquiring the Internet firm, as there is, by definition, ready entry into the Internet product space. The rapid rise of Amazon, Google, eBay, Yahoo, Skype, Facebook, and others testifies to that fact.

So, the traditional multiproduct firm has no choice but to produce *n*+1 products and metamorphose into an Internet company.[10] The necessary

[7] Ohio v. Am. Express Co., 138 S. Ct. 2274 (2018).

[8] Aspen Skiing Co. v. Aspen Highlands Skiing Corp., 472 U.S. 585 (1985).

[9] Pacific Bell Tel. Co. v. linkLine Commc'ns, Inc., 555 U.S. 438 (2009).

[10] For simplicity of exposition, the "*n*" in "*n*+1" denotes an identical basket of product offerings among multiproduct firms. But what happens when the combination of product offerings among rivalrous mul-

transition might well be difficult for managers who have a completely different mindset from that of Internet entrepreneurs. That is one reason why mergers, acquisitions, and related corporate-control transactions are likely to occur. Otherwise, the traditional multiproduct firm might well go bankrupt while its investors waited for the firm's managers to reinvent themselves in this most improbable manner. Considering the alacrity with which new Internet ventures can capture revenue streams previously controlled by traditional firms (Google, Skype, and Craigslist are by now rather dated examples), the traditional multiproduct firms lack the luxury of time.

After the metamorphosis is complete, the melded firm is—still—a multiproduct firm subject to the Baumol-Swanson law that pervasive price discrimination among rival multiproduct firms will drive down margins to competitive levels. But there is, of course, some lag. And it is possible that vertical integration between the traditional firm and the Internet firm will elevate the cost of new entry in the sense of requiring any new entrant to offer an even wider array of products.

In other words, the traditional analysis of the feasibility of entry by a hypothetical firm producing a single product on a stand-alone basis will be a less informative exercise than it once was. The reason is that no firm could compete on a stand-alone basis. The stand-alone cost of entry must, therefore, be recast as the cost of entering the market with a simultaneous offering of the minimally viable vector of products. The entrant must achieve not only minimum efficient scale, but also minimum efficient scope.

Here, the traditional antitrust analysis is inadequate, for it is preoccupied with assessing competition as though it occurred among single-product firms. To be sure, there is recognition that dynamic competition is more important than static competition.[11] But antitrust doctrine does not then proceed to view competition in terms of *dynamic capabilities*—or even in terms of *brands*, which is the shorthand by which economic actors attempt to signal their dynamic capabilities.[12] Once demand complementarities are introduced—and, thus, once ancillary revenue streams are introduced in what

tiproduct firms differs, such that the "*n*" for two multiproduct firms is not identical? That is, the two multiproduct firms still produce the same number of distinct products, but the firms do not produce identical sets of products. One must carefully consider the implications of different product mixes when analyzing multiproduct firms under U.S. antitrust law or competition law elsewhere. For example, do two firms need to produce the same bundles of products to be considered comparable under an analysis of price discrimination? Might two firms offering similar products be deemed to be differently situated and therefore require bespoke analysis under an application of a price-cost test for predation?

[11] *See* United States v. Microsoft Corp., 253 F.3d 34, 49 (D.C. Cir. 2001) (en banc) (per curiam) ("Rapid technological change leads to markets in which 'firms compete through innovation for temporary market dominance, from which they may be displaced by the next wave of product advancements.'") (quoting Howard A. Shelanski & J. Gregory Sidak, *Antitrust Divestiture in Network Industries*, 68 U. Chi. L. Rev. 1, 11–12 (2001)).

[12] *See* J. Gregory Sidak & David J. Teece, *Dynamic Competition in Antitrust Law*, 5 J. Competition L. & Econ. 581 (2009); David J. Teece, Dynamic Capabilities and Strategic Management: Organizing for Innovation and Growth (Oxford Univ. Press 2009).

is essentially a modified Ramsey pricing framework—the standard model of antitrust analysis goes into shock.

But there can be no doubt that the imperative to compete across the dimension of *n*+1 products will generate enormous gains to consumer welfare. This dynamic imperative is the quintessential example of Joseph Schumpeter's "creative destruction."[13]

[13] Joseph Schumpeter, Capitalism, Socialism and Democracy 81 (Kessinger Publishing 2d ed. 2010) (1947).