PERSUASION OR INFORMATION? PROMOTION AND THE SHARES OF BRAND NAME AND GENERIC PHARMACEUTICALS*

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Economists have vigorously debated whether advertising and other messages supplied by sellers to buyers represent the efficient provision of information or the exploitation of buyers' imperfect access to it. Many economists now agree that each view commands some truth. Advertising should convey information efficiently where the buyer can easily verify it. But it may engender inefficient rent-seeking outlays by producers able to hamper buyers' gaining of information from alternative sources. For example, if buyers sample product information randomly, an incumbent can "jam" the channels through which entrants transmit their messages by loading the sampled population with messages of his own.[1] Or the incumbent's messages can reinforce buyers' habits so as to reduce their prior expectations of the value of trying an alternative brand.[2] If sales promotion is effective (by whatever means) in causing buyers to shift among competing products, it becomes a form of rent-seeking outlay by which sellers bid for the available customers.[3] The problem for empirical research is to determine the extent to which seller-supplied information pursues a rent-seeking goal and thus incurs social costs. Those costs must be set against the efficiency advantage of sellers (relative to buyers or

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[1] William S. Comanor, The Political Economy of the Pharmaceutical Industry, 24 J. Econ. Literature 1178 (1986), at 1197, and references cited therein.

[2] Richard Schmalensee, Product Differentiation Advantages of Pioneering Brands, 72 Am. Econ. Rev. 349 (1982). Some evidence on the incidence of informative and rent-seeking outlays in sales promotion is provided by Richard E. Caves, Information Structures of Product Markets, 24 Econ. Inquiry 195 (1986).

[3] See, for example, Sherwin Rosen, Advertising, Information, and Product Differentiation, in Issues in Advertising: The Economics of Persuasion 161, 177–82 (David G. Tuerck ed. 1978).

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third parties) as suppliers of product information demanded by buyers—as Leffler put it, persuasion or information.[4]

The pharmaceutical industry provides a strategic site for testing hypotheses about the scope of rent seeking in manufacturers' sales-promotion outlays. Obviously, physicians who prescribe drugs must acquire extensive information about the uses and limitations of new pharmaceuticals. The manufacturer who must generate the bulk of this information in the course of developing a drug has both the opportunity and the incentive to disseminate it efficiently while the drug enjoys patent protection. When the patent expires the innovator's trademark lives on, but competitors may arise to offer the generic drug at discount prices. The incumbent may sustain its position against such rivals both by current outlays on promotion to jam the entrants' information channels and by anticipatory investments to enlarge the goodwill asset of its trademarked brand. Prescribers' weak incentives for selecting the lowest-price brand enhance the payout to such policies. The physician who prescribes a drug on the basis of seller-supplied information captures no savings from selecting a cheaper generic supplier (these savings seem too small to attract patients away from other physicians), so that the price elasticity of demand for the branded drug is reduced, and the innovator obtains something approximating the advantage of pioneering brands modeled by Schmalensee.[5]

For a sample of drugs that have gone off-patent and encountered generic competition, we address a series of questions about rivalry in sales promotion and pricing between the innovators and the generic entrants.

1. Is the entrants' market share adversely affected by the innovator's accumulated goodwill asset or by his ongoing sales-promotion outlays?

2. How effective are the generics' sales-promotion outlays and price discounts in eroding the innovator's market share?

3. How is this rivalry affected by the passage of time—the number of years in which the innovator enjoyed a monopoly and the number of years since generics first invaded the market?

4. Is the generics' competition less effective (and are innovators' defenses more effective) in the pharmacy than in the hospital market, where incentives to minimize costs operate more strongly?

Before presenting the design in detail we review, in Section I, the evidence of the pharmaceuticals market's susceptibility to rent-seeking sales promotion and characterize the resulting opportunity for dynamic

[4] Keith B. Leffler, Persuasion or Information? The Economics of Prescription Drug Advertising, 24 J. Law & Econ. 47–48 (1981).

optimization by the innovator. Section II outlines the statistical model, evaluates the results, and reports tests of several corollary hypotheses. Section III relates our findings to recent changes in public policy toward pharmaceutical innovators and their competitors.

I. Characteristics of the Pharmaceuticals Market

We review evidence on the positions of pharmaceutical innovators, entrant producers of generic drugs, and health professionals in order to show the role of sales-promotion activities in the decisions made by each group.

Producers of Branded Pharmaceuticals

A pharmaceutical firm that acquires a patent on a new ethical drug becomes a temporary monopolist who knows when its legal protection against entrants will expire. Theoretical analyses of such monopolists' behavior have stressed their scope for maximizing wealth by building a goodwill asset while entry is precluded and by responding optimally to entry when it occurs. If the monopoly holds no durable goodwill asset, its position when legal protection lapses becomes no different from that of new entrants to the market (scale economies and sunk costs permitting). If the monopoly holds a durable but wasting goodwill asset, or if the rate of newcomers' entry is constrained, the monopoly enjoys strategic options in the postpatent period that boil down to ceding market share to entrants at a rate that maximizes the terminal value of its goodwill asset.[6]

During the period of our study, by the time a patented drug was approved by the U.S. Food and Drug Administration for marketing, its developer typically had about half of its seventeen-year patent protection left as a period of legal monopoly.[7] However, the developer gains permanent monopoly of a trademark name that becomes the vehicle for a durable goodwill asset. Thus, any given drug (like T. S. Eliot's cat) has three different names. One, the chemical name, describes the product's molec-

[6] This large literature includes both theoretical models such as Darius W. Gaskins, Jr., Dynamic Limit Pricing: Optimal Pricing under Threat of Entry, 3 J. Econ. Theory 306 (1971); and empirical tests such as Robert T. Masson & Joseph Shaanan, Stochastic-Dynamic Limit Pricing: An Empirical Test, 64 Rev. Econ. Stat. 413 (1982).

[7] Mean-effective patent life had declined from about sixteen years in the mid-1960s to seven to nine years after 1978. See Richard A. Spivey & A. Gene Trimble, Effect of the Drug Price Competition Act on Market Exclusivity of New Drugs: A Simulation, 20 Drug Information J. 27 (1986). Although drugs on patent are sometimes licensed to another company or sold jointly by two companies as part of a dual marketing arrangement, most drug products

ular structure to scientists. The generic name is a shorter, simpler version of the chemical name and is not protected by a trademark. The brand name assigned by the developer and given trademark protection is typically shorter and easier to remember than the generic name.

The pharmaceutical industry promotes its products heavily. For many research-based firms the promotion budget can be twice to four times as large as the budget for research and development, with sales promotion running 20 to 30 percent of sales.[8] The most heavily used form of promotion consists of visits to physicians, pharmacists, and other health-care professionals by sales representatives of the producers of branded pharmaceuticals. Almost 70 percent of the pharmaceutical industry's promotional budget is spent on personal promotion, known as "detailing." Another 27 percent is spent on advertising in the many journals addressed to physicians, who receive on average between seven and twenty journals a month.[9] Direct mail accounts for the balance of measured promotional outlays. A number of activities of pharmaceuticals firms are geared less toward promoting a specific drug than enhancing the general reputation of the company. These include textbooks, audiovisual aids, and lectures and seminars sponsored as part of continuing medical education for physicians.

There is evidence that the goodwill asset built up for a patented drug substantially outlasts the patent protection. Bond and Lean examined the development of two therapeutic markets, orally effective diuretics and antianginals. In each, the first firm to offer a new product was able to maintain a substantial market share despite entry into the therapeutic class of other drugs that were priced lower and promoted more heavily, although late entrants tended to be more successful when their brands offered some therapeutic novelty.[10]

After the patent's expiration, sales-promotion outlays and other differentiation strategies remain open to branded producers. Certain qualitative strategies of product differentiation are especially useful in the postpatent period. The delivery system—the system required to deliver medication to the part of the body where a therapeutic effect is desired—is a common element of product differentiation. Differentiated oral dosage forms in-

[8] Drug Product Selection, Staff Report to the Federal Trade Commission, Bureau of Consumer Protection 32 (1979); Comanor, *supra* note 1, at 1196.

[9] Drug Product Selection, *supra* note 8, at 58.

[10] Ronald S. Bond & David F. Lean, Sales, Promotion, and Product Differentiation in Two Prescription Drug Markets, Staff Report, Bureau of Economics, U.S. Federal Trade Commission (1977). The value of these goodwill assets is also confirmed by the evidence that most (excess) profits earned by the pharmaceutical industry are due to new drugs. See Martin N. Baily, Research and Development Costs and Returns: The U.S. Pharmaceutical

clude time-release capsules and enteric coated pills. Taste can be an important factor, particularly to ensure patient compliance. Differentiation in packaging, such as the provision of prepackaged unit doses and special packaging to fit hospitals' dispensing units, provides an additional opportunity for protecting the market for patent-lapsed products. The appearance of a trademarked pill apparently can be protected from imitation by an entrant; furthermore, the branded manufacturer can form its pill in a shape that is linked to the registered trade name.

Producers of Generic Drugs

The new producer of a drug is foreclosed from using the discoverer's trademarked name but can choose between promoting its own brand name (often an amalgam of the generic name and the name of the producer) or simply offering the drug under its generic name. While some of the larger producers of "commodity" generics promote the names of their companies, most do not.

Drug innovators face price-inelastic demands and accordingly set prices markedly in excess of marginal costs.[11] Entrants therefore have the opportunity to quote prices that exceed their marginal costs while offering large discounts from the patent holder's price. Discounts average at least 20 percent and may leave generics' prices to final consumers as much as two-thirds below the original branded drug's.[12] While small retail pharmacies usually pay prices close to the published list, prices paid by pharmacy chains or buying groups, health maintenance organizations, hospitals, and other large buyers, such as governments, can vary widely. Both brand and generic manufacturers sell their products to hospitals at discounted prices that can fall as low as 25 percent of prices to pharmacies. Bid and group purchasing by hospitals can dramatically lower the prices paid for pharmaceuticals.[13] Thus, price differentials selected by entrant generic producers and responses by the developers of branded drugs

[11] The evidence confirms our expectation that new drug products with any therapeutic novelty set prices that are high relative to their established competitors in the therapeutic class, but these relative prices drop over the next few years. See W. Duncan Reekie, Price and Quality Competition in the United States Drug Industry, 26 J. Indus. Econ. 223 (1978).

[12] In our own sample (described below) the average discount for generics at wholesale is 56 percent. Prices vary among entrants, with branded generics and products of the larger manufacturers carrying premia over the smaller generic companies. A 1980 sample of thirty-seven multisource drugs found retail prescription prices for generics to average 24 percent lower. See Alison Masson & Robert L. Steiner, Generic Substitution and Prescription Drug Prices: Economics Effects of State Drug Product Selection Laws 36 (1985).

[13] A 1978 study showed that nineteen multisource products were on average 31 percent

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