

Summary

This study presents an analysis of the contact lens industry in the United States, emphasizing the role of economics and public policy in shaping past and future development. The analysis follows the general format usually employed in such industry studies: 1) the evolution and present configuration of the structural and institutional features, including public policy, that define the contact lens industry; 2) the corporate strategies and policies conditioned by this operational context; and 3) the end results of these strategies and policies in terms of the technical improvement of contact lenses, the ways of making them, and the prices at which they are sold.

In following this general format, the study is both descriptive and analytical. The descriptive aspects include the historical evolution of contact lenses (ch. 2); the range of available lens types (ch. 3); the characteristics of wearers of contact lenses, how much they spend, and the sources of payment for these contact lenses expenditures (ch. 4); the firms that make contact lenses (ch. 5); the eye-care professionals who represent the bridge between makers and users by prescribing and fitting contact lenses, and toward whom lens manufacturers direct most of their marketing efforts (ch. 6); and the regulatory context within which the entire manufacturing and selection process takes place (ch. 7).

The first part of the analysis relates structure to behavior, or the influence that the number, size, market power, and policies of the makers of contact lenses have on their incentives and behavior regarding competition in product development and price.

The second part of the analysis focuses on the role played by public policy in influencing this competition, either directly or indirectly. The more important elements of public policy affect: 1) mergers, 2) market entry, 3) competition in the professional prescribing and fitting of contact lenses, and 4) the payment mechanism in the purchasing process.

Why is it important to know these features of the contact lens industry and how public policy affects the industry's operation, when the industry is quite small, with annual domestic sales at the manufacturers' level currently running about \$350 million? First, the analysis of any industry, however small, provides another economic case study that adds to our knowledge of how industry structure and public policy affect the competitive behavior of firms in the marketplace. Second, the contact lens industry gives every indication of growing considerably in the relatively near future; thus, its record in product improvement and pricing will be increasingly important relative to the full range of goods and services produced in the economy. Third, the study of the effects of public policy regarding the contact lens industry can provide guidelines for the formulation of sound policies in the future toward this industry, and, in turn, by serving as a case study, for the formulation of effective policies to influence the activities and performance results of other industries, both inside and outside the medical sector.

Contact lenses are of three types, although the distinctions between the types could conceivably disappear in the future. The first type of *modern* contact lens was the hard "PMMA" (for "polymethylmethacrylate") lens, made of plexiglass-type plastics. The advantages of this type are relative rigidity (where flexing may be a problem), smallness, lightness, safety (minimal risk to the eyes), ease of precision-machining, ease of maintenance, and durability. Their major disadvantage is that they are impermeable to oxygen and interfere with the flow of oxygen to the cornea. For a sizable proportion of potential wearers, this problem may actually deter the wearing of PMMA lenses; for others, wearing time becomes limited to a usual daily maximum of 8 to 16 hours. PMMA lens wearers may also incur "spectacle blur" when switching from lenses to glasses.

The second type of contact lens is made from water-absorbing plastics called "hydrogels" (mostly

“HEMA”—for “hydroxyethylmethacrylate”—hydrogels, but other hydrogel materials are also popular) or soft silicone. Their water absorbency and resulting softness make them considerably more easy to adapt to and more comfortable for longer periods, but the same characteristics make them fragile, provide less acute vision correction, and may increase the likelihood of eye infections from handling and wearing.

The third type of lenses is gas permeable. These lenses have much of the superior optical and ease-of-care qualities of hard lenses because of their rigidity, and the comfort of soft lenses because they are oxygen permeable.

About 120 million people in the United States wear corrective eyeglasses and another 16 million to 18 million use contact lenses, either exclusively or interchangeably with eyeglasses. Among all U.S. contact lens wearers, the use of hard lenses is declining and the use of soft and gas permeable lenses is increasing. For new fittings, hard lenses represent a minor share, soft lenses predominate, and gas permeable are the fastest growing. For both new fittings and replacements together, soft lenses represent upwards of 75 percent of the total market, probably their peak figure. Hard lenses have 15 percent or less of the market, and gas permeable at least 10 percent.

In the future, soft and gas-permeable lenses will account for almost all lens sales, perhaps about equally. There are some signs that a hybrid type of lens, combining the best qualities of each type, may be emerging. If so, then this fourth type will be “the” contact lens of the future. Whether or not this hybrid is developed, contact lenses may become as common or even more common a method of vision correction than eyeglasses, as their comfort, wearability, applications, and effectiveness continue to increase.

At present, contact lenses are particularly useful in the correction of single vision problems, essentially myopia (nearsightedness) and hypermetropia (farsightedness). They are also useful in the correction of astigmatism (a vision defect usually resulting from an irregular, nonsymmetrical conformation of the cornea, which results in a lack of sharpness or evenness of focus) and presbyopia (the loss of flexibility in refocusing from near to

far objects, and vice versa) for which bifocal or multifocal corrective lenses or monovision correction is employed. These “disorders of refraction and accommodation” rank very high among physical problems, as evidenced by patient visits to all eye-care professional practitioners.

Certain interesting features exist in the pattern of contact lens wearers. Unlike eyeglasses, contact lenses have been a “younger person’s” product. The traditional wearer has been the young adult female. However, as the therapeutic applications of contact lenses expand and consumer tastes are altered (partly by increased direct advertising by manufacturers), contact lens usage among males and among older persons is increasing rapidly and the traditional orientation toward the young adult female is disappearing.

The absolute price of contact lenses of all types has fallen significantly in the past decade, a time of high general inflation. Soft lens wholesale prices now are about half their mid-1970s level, and total fitting prices are half or less of their early 1970s level. Lens price reductions have resulted from large-scale entry, excess capacity, and vigorous price competition among manufacturers, particularly in the soft lens group. Total-fitting price reductions reflect these cuts in lens prices and the expanded competition among lens fitters, particularly the large chain optical houses. Continued price competition is likely, and further price declines, if less dramatic, may occur in the future.

Unlike many categories of health care expenditures, the largest proportion of payments for corrective lenses comes from patients, rather than from private or public insurance. Although a number of major collectively bargained employment contracts provide vision-care benefits, such coverage applies only to a small proportion of all workers, provides mainly for eyeglasses, and provides only partial payment for contact lenses when they are covered. In the public sector, contact lenses are insured only for therapeutic, not cosmetic, use. (In a strict sense, all contact lenses that offer vision correction or eye protection are “therapeutic” in use. However, contact lenses that provide correction or protection not achievable through the use of eyeglasses are commonly considered “therapeutic” in use while those afford-

ing benefits also attainable through the wearing of eyeglasses are considered “cosmetic,” since, it is believed, the choice of contact lenses in the latter cases is made on the basis of appearance considerations.) In practice, this means that contact lenses are provided under Medicare, Medicaid, and other public programs mainly in relation to cataract or other eye surgery. As a result of this minimal role of third-party payment in the total source-of-payment pattern, insurance as a whole and public programs in particular have little discernible effect on contact lens usage, development, prices, or resource allocation patterns.

Although a large number of firms produce contact lenses, the manufacture of both soft and gas permeable lenses is concentrated among a very few large firms. However, because of many factors—e.g., the similarity of lenses within each type, the considerable substitutability and resulting competition among types, and excess capacity—competition is active in both product development and price. Where market power is most evenly distributed (hard lenses), price competition is greatest. Where large firms dominate but are surrounded by a fringe of smaller firms (soft lenses), price competition is high. Where only a few firms are in the market and one predominates (gas permeable lenses), price competition, among groups if not within this group, is at least observable.

Yet public policy has not had benign effects on market competition. As a result, the degree of competition is probably less than it otherwise would be, and the gap between the actual and potential levels may widen in the future. To the present, the history of this industry shows the important role of small firms as generators of innovational progress, service, and price rivalry. Yet the sector most open to small firms—hard roses—is becoming less important as time passes. In the soft-lens area, energetic small firms have difficulty entering the market, and mergers and acquisitions by large firms may eliminate many of them. And small firms have the greatest difficulty in entering the fastest growing market area—gas-permeable lenses. The greatest potential obstacle to the attainment of optimal product and price competition in the future is the U.S. Food and Drug Administration’s premarketing

approval policies, which have been especially burdensome to smaller firms. Restrictive market approval policies may be wise for significantly new lens types, but once their effectiveness and safety become established, more flexible approaches toward minor or closely similar new developments seem warranted.

The study also examines the role of contact lens prescribers and dispensers (ophthalmologists, optometrists, and opticians) in the eye-care field. Ophthalmologists are medical doctors specializing in eye care, and vision correction is a large part of their activity. There are about **12,500** ophthalmologists in the United States, of whom 11,000 are involved in regular patient care. Optometrists, who are licensed to measure and fit corrective lenses, outnumber ophthalmologists by roughly two-to-one, and fit proportionally more corrective lenses. Opticians are usually limited to making contact lenses or to fitting them under the supervision of an optometrist or ophthalmologist, but in some States they may measure for and fit corrective lenses. There are an estimated 26,000 dispensing opticians. Recent action by the U.S. Federal Trade Commission (FTC), however, has expanded the competitive roles of these dispensing opticians. The FTC requires all lens prescribers to provide copies of the prescription to the patient. Thus, patients may take these prescriptions elsewhere, including to opticianries, for filling and fitting. State prohibitions against price competition by corrective lens dispensers are also no longer enforceable, and opticians have begun to compete on the basis of price to fill corrective lens prescriptions written by others. Large chains, with inhouse optometrists and opticians, have been the most vigorously price competitive, both for full prescribing and fitting, and for filling prescriptions brought in by patients. Accordingly, public policy has been successful in providing strong competition in the fitting of contact lenses, which is directly advantageous to patients in the forms of expanded choices and lower prices, and indirectly advantageous by exerting a strong counteracting force on any market power among lens manufacturers.

Other Federal policies—tax, import, research funding, procurement—seem to have little, if any, effect on the contact lens industry. Patent policy

is somewhat more important, but not critically so. More importantly, the procompetitive effects of enhancing competition among dispensers could be maximized subject, of course, to the maintenance of high-quality care. An assessment of the effects of unhindered mergers and premarketing

approval requirements could suggest adjustments in policies that would make mergers somewhat more difficult to accomplish and market entry considerably easier. Adoption of more flexible policies of premarket approval merits particular attention.