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Lee Benham

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THE EFFECT OF ADVERTISING ON THE PRICE OF EYEGLASSES*

LEE BENHAM
University of Chicago

I. INTRODUCTION

THE impact of advertising on prices has long been a matter of dispute. It has been argued that the persuasive aspects and the product differentiation effects of advertising tend to raise the prices of products to consumers. On the other hand, by providing consumers with information about products and alternatives in the market, allowing them to economize on search and to locate low-priced sellers more readily, advertising may tend to lower prices to consumers. It may also lower prices by allowing sellers or producers to economize on other merchandising costs and to take advantage of economies of scale. On purely theoretical grounds, therefore, no reliable prediction can be made as to the overall effect of advertising on prices.¹

While there has been much discussion of this question, relatively little has been done to estimate empirically the relationship between advertising and prices. Some studies have compared prices for different brands of "homogeneous" items, some of which were advertised and some of which were not. In general, the advertised brands were found to sell at higher prices.² While such comparisons have frequently neglected such characteristics as quality control, service provided with the sale, location of sales outlets, waiting time to purchase, and inventory and range of stock available, it is not my purpose here to further refine measures of homogeneous commodities. It is rather to propose an alternative approach to this question.

One way to understand better the full impact of advertising on prices is

* I would like to thank Ronald Andersen for generously making available the data used in this study, Sara Paretzky for assistance in editing the data, and Harold Pashner for computer programming. Helpful comments by Gary Becker, Alexandra Benham, Harold Demsetz, Reuben Kessel, Willard Mueller, and Melvin Reder are gratefully acknowledged. This investigation was supported by PHS Grant Number HS00080 from the National Center for Health Services Research and Development.

¹ See The Economist Advisory Group, *The Economics of Advertising: A Study* (1967).

² For example, Borden compared the prices of private and manufacturers brands of several items. An extreme case was that of Bayer aspirin: in 1938 the wholesale price for the generic equivalent was only 17% of the wholesale price for Bayer. See Neil H. Borden, *The Economic Effects of Advertising* 576 (1944).

to examine markets for a product in which advertising is prohibited and markets for the same product in which advertising is allowed, comparing the price structures of the two types of markets. Market organization and price structure may be significantly affected by the presence in a market of even one seller who advertises or who potentially can do so. The full impact on prices of the existence of advertising may be much greater than the price differences we observe when some producers of an item choose to advertise it and others do not.

For a variety of goods and services, especially in the service sector, advertising is frequently prohibited by cities or states. Examples are most services of physicians and dentists, prescription drugs, and eyeglasses. Unfortunately, for most such items there is little if any variation in the restrictions imposed across states. A major exception is eyeglasses: some states prohibit advertising related to eyeglasses and eye examinations while others do not. By examining the prices paid for these items by a sample of individuals in each category of states, we may gain more insight into the impact of advertising on prices.

II. ADVERTISING AND INFORMATION

The full cost of purchase (C_t) of a good to a consumer includes not only the cost of the item itself (C_g) but the cost of knowledge (C_k) concerning the location of sales outlets and prices and the cost of time and transportation (C_t) required to purchase the item:

$$C_t = C_g + C_k + C_t$$

These components of full cost are in part jointly determined. For a given frequency distribution of retail prices offered in the market, the distribution of prices paid (C_g) will depend upon the extent of consumers' knowledge of the alternative prices available and the cost of time and transportation. Past studies have shown that both the mean and the dispersion of prices paid generally decrease as the extent of search (knowledge) increases.³

Insofar as advertising increases consumers' knowledge of alternative prices in the market, it will tend to decrease the mean and dispersion of prices paid. If there are economies of scale in retailing the good, then the effect of advertising in lowering mean prices should be intensified.⁴ In general, large-volume

³ See the work of Stigler and others on the economics of information: George J. Stigler, *The Economics of Information*, 69 *J. Pol. Econ.* 213 (1961); Roger E. Alcala, *Information and the Distribution of Prices*, Sept. 1970 (Dep't of Econ., Columbia Univ., unpublished paper presented at 2nd World Congress of Econometric Society, Cambridge, Eng.).

⁴ However, the consequences for price dispersion are less clear-cut. When economies of scale exist, the size distribution of firms will be changed by advertising. Consequently, the

low-price sellers are dependent upon drawing consumers from a wide area and consequently need to inform their potential customers of the advantages of coming to them. If advertising is prohibited, they may not be able to generate the necessary sales to maintain the low prices. In such a situation, the cost of disseminating information to consumers will more than offset the other economies of scale. At the same time, the likelihood that small-volume high-priced retailers survive in the market will increase. Consequently, the distribution of retail prices offered will shift upward. The question under consideration here is the extent to which economies resulting from the information provided through advertising are offset by the costs of advertising and by product differentiation.

III. ADVERTISING RESTRICTIONS IN THE MARKET FOR EYEGLASSES

The advertising of eyeglasses and eye examinations is controlled in many states by various state agencies. From a predominantly laissez-faire situation in the first decades of this century, the trend has been toward increased regulation and restriction of advertising. In 1963, the year for which data on prices were available for this study, approximately three-quarters of the states had some regulations against advertising. Some states prohibited only price advertising while others allowed virtually no information concerning eye examinations or eyeglasses to be published, broadcast, or in any way distributed.⁵ Since 1963, several additional states have introduced restrictions. The following excerpts are taken from 1963 laws.

Arkansas: The following Acts are hereby declared to be unlawful Acts: . . . For any optometrist, physician, surgeon, individual, firm, partnership, corporation, wholesaler, jobber or retailer to solicit the sale of spectacles, eyeglasses, lenses, contact lenses, frames, mountings, prisms, or any other optical appliances or devices, eye examinations or visual services including vision training or orthoptics by radio, window display, television, telephone directory display advertisement, newspaper advertisement, hand bills, circulars, prospectus, posters, motion pictures, stereopticon slides or any other printed publication or medium or by any other means of

average cost of time and transportation to purchase the given item may increase, even as costs of information fall. In this situation, the dispersion of prices paid will depend upon several factors including the cost of time and transportation to consumers and the functional relationship between prices and volume of sales.

⁵ Because sellers are prevented from advertising through normal channels, they are not necessarily prevented from providing information through other methods. The selling effort within a store is in part a substitute for general advertising. Joint sales arrangements may be developed (where permitted) to take advantage of consumer knowledge concerning low prices for other items which can be advertised. Insofar as these other ways of offering information are close substitutes for regular advertising, then the prohibition will not have much effect.

advertisement; or to use any method or means of baiting, persuading, or enticing the public into buying spectacles, eyeglasses, lenses, contact lenses, frames, mountings, prisms, or other optical appliances or devices for visual correction or relief of the visual system or to train the visual system. . . .

Nothing in this Act except as expressly provided otherwise herein shall apply to physicians and surgeons, nor to persons who sell eyeglasses, spectacles, lenses, frames, mountings, or prisms at wholesale on individual prescriptions to optometrists, physicians, and surgeons. . . .⁶

Florida: Any certificate of registration granted by the Florida state board of optometry . . . may be revoked by said board, if the person . . . is found guilty of unprofessional conduct. . . . 'Unprofessional conduct' . . . is defined to mean any conduct of a character likely to deceive or defraud the public, including among other things free examination advertising, price advertising, billboard advertising, use of any advertising either directly or indirectly, whether printed, radio, display, or of any nature which seeks to solicit practice on any installment payment or price plan. . . .

It is unlawful for any person, firm or corporation to . . . advertise either directly or indirectly by any means whatsoever any definite or indefinite price or credit terms on prescriptive or corrective lenses, frames, complete prescriptive or corrective glasses or any optometric service; to advertise in any manner that will tend to mislead or deceive the public; to solicit optometric patronage by advertising that he or some other person or group of persons possess better qualifications or are best trained to perform the service or to render any optometric service pursuant to such advertising. This section is passed in the interest of public health, safety and welfare, and its provisions shall be liberally construed to carry out its objects and purposes.⁷

A survey was made of several state boards of optometry concerning the sanctions used to enforce these regulations. Injunctions and suspensions of license for periods up to a year were the most common sanctions mentioned by the respondents. In some cases they said that fines were levied and licenses revoked. There appears to be careful policing and enforcement of these regulations in most states.

IV. PRICE DIFFERENTIALS ASSOCIATED WITH ADVERTISING RESTRICTIONS

The data on eyeglass and eye examination prices used in this study were obtained from a 1963 survey of a national sample of individuals. The survey examined use of and expenditures on medical services.⁸ The present study

⁶ The Blue Book of Optometrists 87-88 (1964).

⁷ *Id.* at 146-47.

⁸ See Ronald Andersen & Odin W. Andersen, *A Decade of Health Services: Social Survey Trends in Use and Expenditure* (1967).

uses a subsample of 634 individuals who each underwent an eye examination and/or obtained a pair of eyeglasses in 1963. In addition to the amount spent by individuals for eye examinations and eyeglasses, detailed demographic information on each individual was included in the survey. With this information, the prices paid for eye examinations and eyeglasses could be associated with the state of purchase.

The analysis below deals principally with eyeglasses and not with eye examinations; very few states permitted advertising of eye examinations in 1963. However, 291 individuals in the survey quoted only the combined price of the examination and glasses. Since relatively little variation in the cost of eye examinations was found across states and since prices of examinations and eyeglasses were not highly correlated across states,⁹ the systematic variation in total cost examined here is assumed to reflect variation in the cost of eyeglasses.

To estimate the differential in prices associated with prohibition of advertising, two comparisons were made. First, the mean price paid for eyeglasses and the mean price paid for eyeglasses and eye examination together were calculated for individuals living in states with and without restrictions on advertising. Next, since the demographic characteristics of individuals in the sample were not uniform across the states, the following simple model was used to estimate price differentials.

$$P_i = \alpha + \beta_1 X_{1i} + \sum_{j=2}^5 \beta_j X_{ji} + \mu_i$$

where P_i is the price paid by individual i for his eyeglasses;

X_{1i} is a dummy variable which equals 1 if individual i purchased his eyeglasses in a state with complete prohibition of advertising, and equals 0 otherwise;

X_{2i}, \dots, X_{5i} are total family income, age, sex, and family size.¹⁰

Thus β_1 estimates the average difference in dollars paid for eyeglasses between states with complete prohibition of advertising and states without such prohibition.

⁹ States with low prices for eyeglasses had a higher proportion of combined price quotes. This might disguise lower mean prices for examination in those states.

¹⁰ These variables might account for the differences in prices paid across states. In addition, various other combinations of variables not shown here were examined, including education of individual, race of individual, size of city of residence, and mean level of education and income in county of residence. The coefficient of the advertising variable was basically unchanged when these latter variables were included in the estimating equation.

TABLE 1
 MEAN COST OF EYEGLASSES AND MEAN COMBINED COST OF EYE EXAMINATION PLUS
 EYEGLASSES IN 1963 AS A FUNCTION OF RESTRICTIONS ON ADVERTISING IN STATES
 (in Dollars)

| Population Group | States with Complete Advertising Restrictions | | States with No Advertising Restrictions | | $\bar{X}_1 - \bar{X}_2$ |
|---|---|-----|---|-----|-------------------------|
| | \bar{X}_1 | N | \bar{X}_2 | N | |
| | Eyeglasses Alone | | | | |
| 1) All individuals | 33.04 | 50 | 26.34 | 127 | 6.70 |
| 2) All individuals in Texas, North Carolina, and the District of Columbia | 37.48 | 21 | 17.98 | 27 | 19.50 |
| | Eyeglasses and Eye Examinations Combined | | | | |
| 3) All individuals | 40.96 | 121 | 37.10 | 261 | 3.86 |
| 4) All individuals in Texas, North Carolina, and the District of Columbia | 50.73 | 37 | 29.97 | 72 | 20.76 |

There appears to be no single most satisfactory way to categorize states by the extent to which they restrict advertising, so two sets of estimates are presented to indicate the likely range of impact. The first set of estimates (Table 1, line 1 and Table 2, equation 1) is based on all individuals purchasing eyeglasses in 1963 in states either with no restrictions on advertising or in states with complete prohibition of it.¹¹

To estimate the probable upper bound of the effects of advertising restrictions, the second set of estimates (Table 1, line 2 and Table 2, equation 2) is based only on individuals living in states at the extremes: Texas and the District of Columbia, extreme laissez-faire states, versus North Carolina, a state with extensive restrictions in force for a number of years prior to 1963 (hence

¹¹ Several sources of information were used to determine states' restrictions on advertising. State laws were canvassed, a survey of state optometry board members was made, 1963 newspapers from several states were sampled to search for eyeglass advertisements, and optometrists in several states were contacted. The problem was to ascertain not only the restraints against advertising by optometrists but also the restraints against advertising by other sellers. In some states optometrists were prohibited from advertising but opticians or commercial firms were permitted to advertise. States were classified as allowing advertising if any sellers were permitted to advertise. Despite the aforementioned search, it was not possible to classify several states satisfactorily. Furthermore, Ohio was excluded because cities apparently had regulatory authority over advertising; New Jersey was excluded because the individuals sampled lived predominantly near New York City, creating substantial classification problems. In addition, the original survey did not include respondents from some states. In the estimates here, states classified as having no restrictions on advertising in 1963 are: Alabama, the District of Columbia, Georgia, Illinois, Indiana, Kansas, Maryland, Michigan, Minnesota, Missouri, Texas and Utah. States classified as having total prohibition of advertising are Arkansas, Massachusetts, North Carolina, North Dakota, Oklahoma, and South Carolina.

TABLE 2
REGRESSION ESTIMATES FOR COST OF EYEGLASSES AND COMBINED COST OF EYE EXAMINATION PLUS EYEGLASSES FOR VARIOUS POPULATION GROUPS IN 1963 AS A FUNCTION OF RESTRICTIONS ON ADVERTISING IN STATES AND OTHER VARIABLES
(t statistic in parentheses)

| Population Group | Complete Advertising Restrictions | | Total Family Income | Age | Sex | | Family Size | Constant | R ² | \bar{R}^2 | N |
|---|-----------------------------------|-----------------|---------------------|-----------------|----------------------|--|-------------------|-----------------|----------------|-------------|-----|
| | 0 = No, 1 = Yes | 0 = No, 1 = Yes | | | Female = 0, Male = 1 | | | | | | |
| EYEGLASSES ALONE | | | | | | | | | | | |
| 1) All individuals in states with complete restrictions or with no restrictions | 7.482 (2.5) | | .03981 (1.4) | .01246 (.17) | -3.192 (-1.1) | | .1256 (.11) | 23.27 (3.5) | .046 | .018 | 177 |
| 2) All individuals in Texas, North Carolina and District of Columbia | 18.89 (4.1) | | -.02422 (-.5) | .1572 (1.1) | -8.298 (-1.6) | | .1599 (.07) | 18.06 (1.54) | .34 | .26 | 48 |
| EYEGLASSES AND EYE EXAMINATION COMBINED | | | | | | | | | | | |
| 3) All individuals in states with complete restrictions or with no restrictions | 4.33 (1.96) | | .04560 (2.03) | .05615 (.96) | -2.998 (-.15) | | -1.528 (-1.92) | 36.72 (7.5) | .038 | .025 | 382 |
| 4) All individuals in Texas, North Carolina and District of Columbia | 21.07 (5.6) | | .001651 (.04) | .06701 (.63) | -3.437 (.94) | | -2.54 (-1.6) | 37.30 (4.5) | .28 | .25 | 109 |

likely to have the long-run effects of these restrictions in evidence). This latter set of estimates is likely to overstate the impact of advertising restrictions, since North Carolina had other laws which would tend to raise prices independent of advertising regulations, and the proportion of the total price difference which can be attributed to advertising restrictions cannot be determined at this stage.

In the first set of estimates, the difference in mean prices of eyeglasses between the two categories of states is \$6.70, with the lower mean price found in states having no advertising restrictions (Table 1, line 1).¹² The regression estimate of the difference is similar, \$7.48 (Table 2, equation 1). The difference in price between the most and least restrictive states is much larger, \$19.50 as measured by means (Table 1, line 2) and \$18.89 as measured by the regression coefficient (Table 2, equation 2). Estimates using combined cost of eyeglasses and eye examinations yield the same results, although the absolute difference is somewhat smaller in one case (Table 2, equation 3).

Despite the shortcomings of these estimates,¹³ they serve to indicate the direction and magnitude of effect. The estimates of eyeglass prices alone suggest that advertising restrictions in this market increase the prices paid by 25 per cent to more than 100 per cent.¹⁴ Furthermore, these estimates are

¹² The coefficient of variation in prices (σ/X) is also smaller in states which allow advertising (.56) as compared with states which prohibit advertising (.73).

¹³ The coefficient of determination is low in these estimates. In terms of predicting the prices paid by individuals for eyeglasses, the model is obviously incomplete. A higher R^2 would be desirable, but results of this order are common in estimates of economic models which use individual data. One of the likely reasons for the low R^2 in this case is the unmeasured variation in type and quality of eyeglasses purchased. In the survey used, individuals were not asked about the specification or quality of frames and eyeglasses purchased. However, provided that quality is uncorrelated with the advertising variable X_1 , the coefficient β_1 is an unbiased estimate of the systematic effects of advertising on prices. This issue is discussed *infra* at 345-48.

It has also been suggested that the difference in prices between states with advertising and states without is due to systematic variation in types of service provided: where physicians are the more frequent source of eye care, that is, in the restrictive states (see Table 4), fees for non-routine services may have been more frequently included with fees for eye examinations and eyeglasses. Although all the original questionnaires were examined for any indication that services other than eye examination and eyeglasses were provided, and those cases were excluded from the estimates of this paper, the possibility remains that a few non-routine items may have been included in the sample. To see if a few expensive cases affected the overall results, *median* prices for eyeglasses were calculated. The difference in median prices between states with advertising and states without is \$4.00, and between North Carolina and Texas and the District of Columbia is \$14.00, with the higher prices in the states restricting advertising.

¹⁴ A further comparison was made by sampling, through personal visits, the prices of eyeglasses at nineteen opticians, optometrists, and commercial firms in Texas and New Mexico in July, 1971. A price quote was requested for eyeglasses with a given lens and frame specification without an examination. The mean price sampled in New Mexico, a

likely to understate the total savings to consumers occasioned by advertising, since the search process itself is less expensive when information is more readily and cheaply available.¹⁵

V. ALTERNATIVE EXPLANATIONS OF OBSERVED PRICE DIFFERENTIALS

Some have argued that in this model advertising restrictions serve only as a proxy for other restraints on competition.¹⁶ If this is so, then the higher prices observed in states with restrictions on advertising may be improperly attributed to the advertising restrictions. For example, interstate barriers to mobility for optometrists and opticians might account for the observed price differentials. If there are effective barriers to entry in some states, there will be an artificially low number of optometrists and opticians per capita there,¹⁷ and this in turn will be reflected in higher prices. If states restricting advertising also keep the number of optometrists and opticians artificially low by restrictions on entry, then the higher prices might be inappropriately attributed to advertising restrictions.

To examine this question, the equations in Table 1 were re-estimated including as additional variables the number of optometrists and opticians per capita. To the extent that barriers to entry are systematically associated with the restrictions on advertising, the coefficient of the advertising variable should be reduced in absolute value when these two variables are added to the equation. However, the coefficient of X_1 was essentially unchanged when these two variables were added.

Many other types of regulations, if vigorously or selectively enforced, could

state with restrictions on advertising, was \$31.70 ($n = 10$) and in Texas, a state without restrictions, \$25.90 ($n = 9$). The difference in mean prices paid by consumers would be larger than those figures indicate, since the volume of sales in the low-priced firms in Texas is much larger than the average volume of the other outlets.

Consumers in New Mexico are apparently not completely unaware of the lower prices in Texas. A newspaper editor from Albuquerque, New Mexico told Professor Yale Brozen of the University of Chicago that some families had in the past driven from Albuquerque to Amarillo, Texas to purchase glasses, a distance of 288 miles.

¹⁵ Other associated costs of purchase such as transportation and time costs required to purchase items may increase with advertising. If so, the savings in search would be partially offset.

¹⁶ A related argument suggests that advertising restrictions serve as a proxy for collusive behavior by sellers. Since there are a large number of establishments in the states included here, effective collusion appears unlikely without some method of enforcement. The most likely method would appear to be state laws or regulations. If prohibition of advertising is the only method used to reduce competition, then the argument presented earlier holds. If other restrictive legislation is involved, then the issue is that discussed in this section.

¹⁷ For discussion of this issue, see L. Benham, A. Maurizi & M. Reder, Migration, Location and Remuneration of Medical Personnel: Physicians and Dentists, 50 Rev. Econ. & Stat. 332 (1968).

reduce competition and raise prices. These range from restrictions on employment of optometrists to extra-legal harassment. Unfortunately, they cannot be investigated as easily as barriers to entry because of the difficulties in classifying states according to the severity of these other regulations. *A priori* judgments concerning the effects of each regulations are quite arbitrary, and data limitations prevent the development of a model at this time to estimate the separate effects of each such regulation on prices.

In an attempt to deal with these problems, representatives of several optometric associations and commercial firms were contacted to obtain assistance in classifying states according to the extent of these other types of regulations. There was general agreement that certain states were generally restrictive (for example, North Carolina) and that others were generally unrestrictive (for example, Texas), but otherwise opinion diverged. There appeared to be considerable variation in these other types of regulations across states in both groups: advertising and non-advertising. An attempt was made to match states which allowed advertising with states which did not by the severity of their other regulations. The price patterns obtained were similar to those reported in Tables 1 and 2, but the comparisons were crude at best.

The representatives of commercial firms were also asked to give their assessments of the impact of advertising restrictions. All stated that the presence or absence of advertising restrictions affected their decision to move into new market areas. Several said that they would not enter a new market unless advertising were permitted, no matter what the other restrictions.¹⁸ Furthermore, the representatives of two large commercial firms stated that the retail prices of their own firms varied across states, with the higher prices in the states with advertising restrictions.

Data limitations prevent a fuller treatment of this question. The qualitative evidence presented hardly eliminates the possibility that the advertising variable serves as a proxy for other restrictions.¹⁹ Nevertheless, the available evi-

¹⁸ The data used in this study suggest that commercial firms have a larger share of the market in the states with lower prices (Table 4). Another recent study of prices charged for frames and lenses by optometrists and by retail stores in New York showed substantially lower prices in the retail stores. The study also found that prices charged by optometrists were lower in an area with a high concentration of commercial firms (New York City) than in areas with a lower concentration of commercial firms. See A Retail Shopping Study of Optometrists and Retail Opticians, submitted by Marketing Research Dep't, Dale System, Inc., to N.Y. St. Optical Retailers Ass'n, January, 1968.

¹⁹ An examination of the changes in prices over time as a function of changes in advertising laws would provide a better test of this question. For example, the actions being currently taken in some areas to reduce restrictions on prescription drug advertising should provide extremely useful evidence on this question.

dence is consistent with the hypothesis that restrictions on advertising reduce competition and raise prices and that the estimates in Tables 1 and 2 reflect the effects of advertising restrictions.

Another type of argument often given by the professionals (optometrists and ophthalmologists) is that the quality of service and product supplied by the "commercial" establishments is lower than that supplied by "professionals." By implication, the average quality of eyeglasses would be lower in states where commercial establishments were more strongly represented,²⁰ the states in which advertising was permitted. During the course of this study, several professionals referred to their own personal experience with low quality commercial work. Commercial representatives responded to these charges with allegations of low quality work by certain professionals. Although standards do not appear to be uniform across establishments, either commercial or professional,²¹ the issue here is not that of establishing how many of these specific allegations are valid. It is rather one of determining any systematic differences in quality of products between states which allowed and states which prohibited advertising.²² Several attempts were made to investigate this question.

The issue was first examined by investigating the source of eyeglasses by type of retail establishment. Some commercial firms produce their own eyeglasses; however, many purchase from the same sources as the professionals.²³ The professionals also purchase from the commercial firms. In 1971, one of the largest commercial firms sold only 50 per cent of its eyeglass output through its own retail outlets. The remainder was sold through professional establishments.²⁴ To the extent that commercial and professional firms both

²⁰ See Table 4, *infra*.

²¹ For example, a reporter for the CBS Television Network traveled around the country having his eyes examined in 1969. He had excellent vision and did not wear glasses. He read all the charts and answered all questions honestly. Out of the 28 eye examinations which he took he was given three prescriptions, one each from an optical firm, an optometrist, and an ophthalmologist. CBS Television Network, 60 Minutes, Tuesday, October 28, 1969.

²² Even if the commercial firms sold eyeglasses which were unambiguously lower in quality, the case for eliminating these firms through legislative action is not obviously strengthened. For many individuals, the choice may be between the low quality, low price product and no product at all. The quality issue arises in this study because of the need to compare reasonably homogeneous items across states. For a discussion of the costs and benefits of eliminating "low quality" products from the market, see Milton Friedman, *Capitalism and Freedom*, ch. 9 (1962).

²³ Approximately 90% of eyeglasses worn in the U.S. are made by three companies: American Optical, Bausch and Lomb, and Shuron Continental.

²⁴ In the small survey of eyeglass prices in Texas and New Mexico, one of the highest

have the same source of eyeglasses, possibilities for quality variation are obviously reduced.

The quality issue was then raised with representatives of several large retail chains. They argued that the commercial firms were generally under more careful scrutiny by state regulatory authorities and state optometric association than the typical professional establishments and consequently had to be more concerned about quality control. They also argued that evidence on systematic quality differences would long since have been used against them in political and legal disputes, if any such evidence could be found, and that none had been so presented.

In following up this point, a search was made attempting to locate references to quality differences. No specific evidence was found to support the claim of systematic quality differences as a function of type of firm or of advertising regulations. The headquarters of the American Optometric Association, the Illinois State Optometric Association, and local optometrists were also unable to give any specific references to support these allegations. This lack of evidence does not establish the absence of a systematic difference in quality. However, it is consistent with this position particularly since the professional associations have a strong incentive to generate and use such information in their disputes with the commercial firms.

Some direct evidence on the prices of standardized products is available from two other sources. In a personal survey of retail outlets in Texas and New Mexico in which specification of frames and lenses was uniform, prices were found to be higher in New Mexico, a state with strict advertising laws.²⁵ The Bureau of Labor Statistics also collects price estimates of eye examinations and eyeglasses across cities for the consumer price index. The specifications used in pricing eyeglasses are quite detailed and leave little room for variation in type or quality of lenses or frames. The published data do not permit a comparison across states, and the Bureau would not release its detailed price estimates by cities. However, a representative at the Bureau who was familiar with its price estimates of eyeglasses stated that the price patterns were similar to the ones found here: cities in states with advertising restrictions tended to have higher prices than cities in states without restrictions.

The findings discussed in this section, although far from conclusive, suggest that variations in quality were not responsible for the results presented in Tables 1 and 2.

prices quoted was by an optometrist in New Mexico who was selling frames and lenses produced by Texas State Optical, one of the large and low priced commercial firms in Texas (see *supra* note 14).

²⁵ See *supra* note 14.

VI. CONTENT OF ADVERTISING

The results presented above are consistent with the hypothesis that, in the market examined, advertising improves consumers' knowledge and that the benefits derived from this knowledge outweigh the price-increasing effects of advertising. However, some individuals have argued that eyeglass advertising contains substantially more information than other types of advertising and that consequently these findings cannot be generalized to most other goods and services.²⁶ It is true that there has been little if any advertising of eyeglasses on national television, a medium which some feel provides a less information-intensive form of advertising. However, there has been considerable local and statewide television advertising in those states which allow advertising. One large commercial firm spends 80 per cent of its advertising budget on television.

As one means of investigating this question further, newspapers of several cities in Illinois, a state with no advertising restrictions on eyeglasses in 1963, were examined for 1963 advertisements. During a week's search, few advertisements were found which contained any reference to price, and fewer still quoted specific prices. The proportion of eyeglass advertisements which contained price information was smaller than for most other items advertised in the newspapers, in particular clothing and furniture. This is obviously fragmentary but suggestive evidence that eyeglass advertising is not markedly more information intensive than other advertising.

Note that the relative infrequency of price advertising of eyeglasses is not necessarily inconsistent with the argument that restrictions on advertising have a significant impact on price. Only a few price advertisements may be required to inform a sufficient number of consumers so that the average purchase price is reduced substantially. Non-price advertising may also be a close substitute for price advertising.

To examine the effect of non-price advertising on prices, I re-estimated Table 2, equation 1 with the addition of individuals in the sample who purchased eyeglasses in states which in 1963 prohibited price advertising but allowed other types of advertising.²⁷ A dummy variable X_6 was added, where X_6 equals 1 if the individual purchased eyeglasses in a state which prohibited only price advertising, and equals 0 otherwise. The results are shown in Table 3. The coefficient of X_6 suggests that in states prohibiting only price advertising prices are slightly higher than in states with no restrictions, and

²⁶ For an interesting discussion of advertising as information, see Phillip Nelson, *Information and Consumer Behavior*, 78 *J. Pol. Econ.* 311-29 (1970); and Phillip Nelson, *Advertising as Information*, (unpublished manuscript at St. Univ. of N.Y. at Binghamton).

²⁷ These states were California, Florida, New York, Oregon, and Virginia.

are considerably lower than in states prohibiting all advertising.²⁸ This estimate suggests that even "non-price" advertising may lower prices.

TABLE 3
REGRESSION ESTIMATES FOR COST OF EYEGLASSES FOR VARIOUS POPULATION GROUPS IN 1963
AS A FUNCTION OF RESTRICTIONS ON ADVERTISING IN STATES AND OTHER VARIABLES
(t statistic in parentheses)

| Population Group | Complete Advertising Restrictions 0 = No, 1 = Yes | Restrictions on Price Only 0 = No, 1 = Yes | Total Family Income | Age | Sex Female = 0 Male = 1 | Family Size | Constant | R ² | N |
|------------------|--|---|---------------------|-----------------|-------------------------------|-------------------|----------------|----------------|-----|
| EYEGLASSES ALONE | | | | | | | | | |
| All individuals | 7.369 (2.4) | 1.320 (.55) | .03154 (1.3) | -.0003 (.00) | -2.645 (-1.2) | -.01409 (-.02) | 24.73 (4.7) | .028 | 287 |

VII. WHO BENEFITS?

The discussion thus far has been concerned with the costs of advertising restrictions to consumers. The extent to which various groups supplying eyeglasses benefit from these restrictions depends upon a number of factors including the elasticity of demand for eye examinations and eyeglasses, the effect of advertising restrictions on firm size, the level of specialization within firms of differing sizes, and restrictions on entry into the state.

A crude estimate of the elasticity of demand can be obtained by comparing per capita expenditures on eyeglasses and eye examinations for the total sample population in states which restricted advertising and in those which did not. Two comparisons were made, one for the sample as a whole and one for the subset of Texas, the District of Columbia, and North Carolina. Both results suggest that the industry faces an inelastic demand, since per capita expenditures were higher in states which had higher prices (and which had restrictions on advertising).

There is in addition some evidence which suggests that the share of the market held by the large commercial firms declines when advertising is prohibited (Table 4). The individuals in the sample were asked about the source of their eye examinations and eyeglasses, and responses were classified into four categories: physicians, optometrists, firms (or clinics), and unknown. The first two categories are more likely to indicate individual or small firm operations, while the third category is more likely to represent larger com-

²⁸ This estimate should be viewed with caution, because without the observations from New York the coefficient of X_6 would be approximately the same as the coefficient of X_1 .

TABLE 4
SOURCE OF EYE EXAMINATION AND EYEGLASSES FOR INDIVIDUALS IN STATES WITH
AND WITHOUT ADVERTISING RESTRICTIONS, IN 1963
(percentage)

| Population Group | Physicians | Optometrists | Clinic or Firm | Source Unknown |
|--|------------|--------------|----------------|----------------|
| Individuals living in states with advertising permitted | 22.1 | 31.1 | 36.4 | 10.3 |
| Individuals living in states with all advertising prohibited | 39.7 | 43.7 | 15.0 | 1.6 |
| Individuals living in Texas and the District of Columbia (advertising allowed) | 13.6 | 16.4 | 52.0 | 1.6 |
| Individuals living in North Carolina (advertising prohibited) | 55.3 | 39.5 | 5.3 | 0.0 |

mercial firms. Although these figures should not be interpreted as accurate measures of the distribution of sales by firm size, the results do suggest that a larger fraction of purchases are made from "large" firms in states which allow advertising. The frequency with which the large chains were specifically named as the source also follows the same pattern. Since larger firms tend to employ fewer optometrists per volume of sale,²⁹ a decline in the large firms' share of the market would appear to benefit optometrists and physicians.

Finally, advertising restrictions make it more difficult for new firms to become established, and they increase the opportunities for price discrimination.

Taken together, this evidence suggests that established optometrists and other professionals within a state are likely to benefit if advertising is prohibited, not a surprising conclusion given the enthusiasm with which they support these restrictions.³⁰

VIII. CONCLUSION

Several professors in economics and marketing at the University of Chicago were asked whether they thought the price of eyeglasses would increase or decrease if advertising were prohibited. Of those individuals polled, approxi-

²⁹ Higher costs of production are often alleged to be evidence of higher quality, particularly when the higher costs are associated with the use of a larger proportion of professional inputs. This argument essentially defines the quality of output in terms of the quality (costs) of inputs and denies benefits to specialization in production.

³⁰ When questioned about restrictions on advertising in the District of Columbia, an optometrist there informed me that there were none but that such restrictions would be the first item on the agenda if the optometrists ever obtained professional control.

mately 40 per cent of the economists and 100 per cent of those in marketing expected prices to be the same or lower where advertising was prohibited. It is, I think, the most common view to emphasize the costs of advertising,³¹ the demand inducing and product differentiating aspects and to put relatively less emphasis on the information provided and the effects of this information on organization and efficiency in the market. These results suggest that, at least for the item considered, the emphasis has been misplaced. Prices were found to be substantially lower in states which allowed advertising.

The extent to which these results can be generalized to other goods will have to await further study. Eyeglasses may of course be a special case. Nevertheless, on a question which has in the past been overwhelmingly judged on *a priori* grounds, it has been possible to obtain a range of estimates of the impact of advertising on prices.

³¹ Several large commercial firms were questioned about their advertising costs per pair of eyeglasses sold. Such a figure is often used to estimate the cost to consumers of advertising. Only one firm, a large firm operating in many states, was willing to provide this information: its average expenditure on advertising per pair of glasses sold is approximately \$2.00.