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October, 1981

INDUSTRIAL ORGANIZATION AND CONSUMER SATISFACTION/DISSATISFACTION

Working Paper No. 281

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FOR DISCUSSION PURPOSES ONLY

Abstract

Hypotheses derived from industrial organization and antitrust economics concerning the impact of structural variables on consumers' experienced dissatisfaction are examined. The results show that most of the variation in dissatisfaction is due to distributional and cost/size factors. No evidence was found in support of the traditional antitrust thesis that high levels of industry concentration have an adverse effect on consumer satisfaction.

Most research attempting to explain consumer satisfaction/dissatisfaction (CS/D) has drawn upon theoretical models from psychology and social psychology, where the individual consumer is the unit of analysis and CS/D is typically viewed as a function of expectation. Examples are comparison level theory (LaTour and Peat, 1979; Swan and Martin, 1981), assimilation contrast theory (Anderson, 1973), and adaption level theory (Oliver and Linda, 1981). While these efforts have met with mixed success (Oliver, 1980; LaTour and Peat, 1979; Russo, 1979; Westbrook, 1980; Oliver, 1977), they are not designed to explain the variation of CS/D across industries and products. Yet, knowledge about why certain industries face more consumer discontent than others seems a necessary condition for the development of effective antitrust and public policy.

Explanations based on disconfirmed consumer expectations have limited value in this regard. Instead, the unit of analysis must be in a more aggregate form. Although there have been very few studies at the market level of analysis, some promising empirical results have been reported. Fornell and Didow (1980) developed a simple economic model that accounted for 63 percent (adjusted R^2) of the variation in consumer complaining for a sample of 13 industries. One implication of their findings is that the way in which an industry is structured impacts upon consumer complaint activity. Although their study dealt exclusively with consumer complaining, their results suggest that the related and antecedent concept of CS/D could also be examined within the context of industrial organization.

It should be noted, however, that although Fornell and Didow provided a stimulus for the present inquiry, their findings were tempered as a result of the relatively few industries examined, the local sample used (Evanston,

Illinois), and uncertainty about the quality of their measurements (validity was not reported). We will attempt to overcome these weaknesses by extending the number of industries analyzed, incorporating additional exogenous variables, using census data coupled with a national probability sample, and, to the extent possible, gathering multiple measures of each variable. By extending the number of industries to 23, most major common consumer goods categories are included, the additional exogenous variables give a more detailed model and census data in conjunction with a large-scale survey provide more generalizable results. Finally, the utilization of multiple measures allows assessment of validity, something that was not possible in the previous study.

THEORY

Study Paradigm

In shifting the unit of analysis from the individual consumer to the market level, the discipline of industrial organization and the closely related field of microeconomics provide the essential paradigm for this study. The field of industrial organization examines how the structure and conduct of buyers and sellers affect economic performance and economic welfare. Structure includes such variables as industry size, industry growth, and the number and size distribution of buyers and sellers. Conduct of sellers can be couched in terms of marketing mix formulations along with other variables controllable by the firm, and performance is often assessed by efficiency, equity, and employment. Rarely is consumer satisfaction an explicit consideration. To our knowledge, the only exception is the SSP (Structure-Strategy-Performance) paradigm formulated by Thorelli (1977), in which consumer satisfaction is represented as a dimension of economic perform-

ance. Nevertheless, the U. S. antitrust doctrine, which is closely aligned with the theories underlying the field of industrial organization, is based on the belief that consumer welfare and satisfaction are enhanced within competitive market structures. Accordingly, seller competition is considered to be essential to the best interests of the consumer. Yet there is no direct empirical evidence in support of this belief, because consumer satisfaction has not been measured relative to market structure. This study represents the first attempt to empirically examine the antitrust proposition from a consumer perspective.

Seller Concentration: Traditional Antitrust Hypotheses

The desirability of low levels of concentration and, presumably, higher levels of competition is fundamental to much of U. S. antitrust law. By examining the theory developed to explain the links between concentration and business conduct, we can derive hypotheses regarding the impact of concentration on consumer dissatisfaction with price.

In brief, the theory holds that the demand function for a firm under conditions of perfect competition is a straight line, parallel to the abscissa. The price is set by the market in such a way that firms obtain pure profits over the long run. In other words, market forces do not allow individual price setting. In an oligopoly situation, where the number of sellers is small, firms recognize their joint interdependence and act accordingly. Although relatively little direct empirical evidence is available on the validity of the traditional oligopoly models, their central thesis is that price is more rigid in an oligopoly and that firms tend (if possible) to avoid price competition. As an industry becomes more concentrated, firms gain in monopoly power and charge higher prices. Thus, traditional anti-

trust and industrial organization theory suggests a first research hypothesis:

H_1 As seller concentration increases, more consumers experience dissatisfaction with price.

In addition to theory, there is related empirical evidence behind the hypothesis. Though many of the studies have been criticized for various reasons (McGee, 1971), the positive relationship between price (and cost margins) and concentration has found consistent support (Koch, 1974).

A related hypothesis concerns the relationship between concentration and consumer dissatisfaction with the product in general. Again, traditional antitrust theory suggests a hypothesis that has remained essentially untested. Fundamentally, the test of serving the consumer is defined as securing competition. At the time of the passage of the Sherman Act in 1890, the role of government was perceived to be the removal of obstacles from the flow of commerce, and there was no doubt that the Congress saw the consumer as the ultimate beneficiary of the act (Thorelli, 1955, pp. 226-227). In the following years and during a long period of antitrust enforcement, the basis for governmental action was structure rather than conduct (Neal, et al., 1968). Litigation against industries with sales of at least $500 million where the four largest firms control more than 70 percent of the market, regardless of their conduct (as in the concept of "no-fault antitrust"), probably represents a culmination of structural emphasis. A hypothesis underlying this contention is:

H_2 As seller concentration increases, more consumers experience dissatisfaction with price and with product performance in general.

Or, more specifically,

H_{2a} As seller concentration increases to the extent that fewer than five firms in an industry of at least $500 million in annual sales control more than 70 percent of the market, more consumers experience dissatisfaction with price and with product performance in general.

Seller Concentration: Rival Hypotheses

Recent empirical work from the PIMS (Profit Impact of Market Strategy) data base (Gale, 1979; Gale and Branch, 1979) found that there was a positive relationship between market share and profits, but that the higher profits did not result from higher prices.[1] Instead, high profits were presumably caused by lower costs, which could be due to such factors as economies of scale, learning effects, and lower per-unit fixed costs. Thus, if price is not related to market share, prices charged in concentrated industries should not be higher than those in industries with many sellers. The rival hypothesis is then the null form of the first hypothesis:

H_3 As seller concentration increases, there is no effect on consumer dissatisfaction with price.

In the near future it seems possible that some antitrust acts may be softened and the powers of the FTC as well as those of the Antitrust Division of the Department of Justice might be curtailed. It is no longer evident that industries with high levels of concentration will be prime targets of government intervention. Led by such well-known economists such as Lester C. Thurow, David Schwartzman, Hendrik S. Hosthakker, H. Michael Mann, and others, another school of thought is gaining in popularity. One of its central arguments, that concentration is a measure of relative competitive efficiency, has been voiced in the past as well (see, for example, McGee, 1971; Brozen, 1971; Demsetz, 1974). Highly concentrated industries are

thought to be a result of the superior efficiency of a few firms in serving their customers. The firms that have failed in this regard have been eliminated from the market. The rival hypothesis of H_2 and H_{2a} is:

H_4 As seller concentration increases, fewer consumers experience dissatisfaction with product performance.

Related empirical support for this hypothesis is provided by the PIMS data. For example, Schoeffler, Buzzell, and Heany (1974) found a strong positive relationship between product quality and market share.

Distribution Breadth

The structure of retail markets may also have an impact on consumer satisfaction. As is evident from the legal restrictions on exclusive distribution, the argument about the importance of competition apply at the retail as well as at the manufacturing level. However, competition at the retail level is perhaps more difficult to measure. Although concentration is far from a faultless measure of monopoly power in manufacturing, corresponding proxies for retailing are even less well developed. On the basis of the traditional economic model of competition, one might venture the hypothesis that a large number of small retailers foster competition and thereby provide consumer satisfaction. However, even though concentration in retailing has increased, competition has not been adversely affected (Stern and Grabner, 1970). According to Scherer (1980), there are probably too many retailers in most major areas for oligopolistic behavior to occur. Further, competition in retailing is typically local and too complex to be captured by concentration measures. Nevertheless, consumer satisfaction may be influenced by the degree of market exposure and the degree to which retailers have the power to differentiate manufacturers' offerings. Powerful retailers can influence both the price and the selection of products

offered to consumers. The countervailing power (Gailbraith, 1952) available to such retailers can be used to balance the power of manufacturers in oligopolistic industries. Retailer power could result from factors such as the absolute size of retailers relative to manufacturers or to the small number of retailers in a given market. Porter (1974, 1976) argues that the major source of retailer power arises when retailers can affect the differentiation of the manufacturers' product. Such differentiation allows retail control or influence on some of the product attributes such as shopping assistance, or retail control of information about the level and existence of a product's attributes.

In Porter's theory, consumer demand for various levels of product differentiation is reflected in two basic types of retail outlets. The first, convenience outlets or mass merchandisers, provide little or no consumer assistance, are densely located, and rely to a large extent on manufacturer advertising for product differentiation. The second type, nonconvenience or specialty outlets, provide more consumer assistance, are selectively located, and emphasize product differentiation by means of customer assistance and product selection. Levels of differentiation can vary substantially across nonconvenience outlets; and the more the retailer provides in terms of differentiation, the more selective is the retail distribution (Porter, 1976).

By combining Porter's theory with traditional management theory, hypotheses specifying the impact of the retail structure on consumer price and nonprice dissatisfaction can be formed. Porter argues that product differentiation and distribution breadth are inversely related. Consistent with traditional management wisdom, as well as consumer behavior theory, product differentiation contributes to higher quality elasticity of demand and lower

price elasticity. Consequently, consumers would become less sensitive to price as distribution becomes more selective. Indirect evidence for this assertion follows from the fact that profit margins are higher for products which are selectively rather than intensively distributed. Applying the elasticity concept to postpurchase situations (cf. Hirschman, 1970), the hypothesis is then:

H_5 As distribution becomes more selective, fewer consumers experience dissatisfaction with price.

As product differentiation increases, consumers focus more attention on nonprice aspects and the quality elasticity of demand increases. In addition, highly differentiated products are often more complicated and more susceptible to breakage than products which are not differentiated. For example, Swan and Combs (1976) found functional problems a major cause of consumer dissatisfaction. Thus:

H_6 As distribution becomes more selective, more consumers experience dissatisfaction with the nonprice aspects of their purchase.

Consumer Cost

Hypotheses 1 to 4 concern the impact on consumer dissatisfaction of structural variables at the manufacturing level. Hypotheses 5 to 6 are formulated at the retail level. There are also important structural variables at the consumer level, one of which is consumer cost.

It seems reasonable to assume that consumers would be more sensitive to dissatisfaction if the purchase requires a large amount of financial resources. Therefore, a high unit price may contribute to experienced dissatisfaction. Several studies have reported a positive relationship between these two variables at the individual consumer level (see Miller, 1976; Hager and Handy, 1979).

The price of a product is a static component of consumer cost. It does not reflect consumption patterns or financial outlay over time. Yet, some low-price items carry a high consumer cost because they are bought frequently. In order to include a more dynamic component of consumer cost, industry sales were used to complement the static price variable. The hypothesis to be tested in this study is:

H_7 As consumer cost increases, more consumers experience dissatisfaction with price and nonprice aspects of their purchase.

DATA

The endogenous variables, consumer price and product dissatisfaction, were obtained from a nationwide survey of urban households by Best and Andreasen (1977). Random telephone interviews in 34 cities during February and March of 1975 generated a total of 2,419 respondents (response rate = 80.3 percent). Both aided and unaided recall approaches were used. Best and Andreasen referred to dissatisfactions mentioned without a probe as "strong problems" and dissatisfactions mentioned following a probe as "weak problems." All data were reported as percentages of total respondents. Table 1 presents the distribution of consumer dissatisfaction for the product categories used in this study.

The survey data reflect problems indicated by consumers who purchased products in the aforementioned categories. They do not include problems indicated by individuals who did not purchase these products. It is possible that the consumers who felt that the price of a product was too high refrained from purchasing it. Thus the data are limited in the sense that they may exclude a major area where price problems are occurring, i.e., with consumers who did not purchase the product. However, there are at least

two reasons why this limitation may not be serious. First, many of the product categories covered are considered by U. S. consumers to be necessities, and purchases would probably be made even if prices were high. Second, as will be discussed shortly, the hypothesized relationships with distribution breadth and consumer cost were strong and in the hypothesized direction. If the price problem data had been seriously flawed, these relationships should not have occurred.

The exogenous variables were designed to correspond as closely as possible to the categories used by Best and Andreasen. The most commonly used measure of seller size distribution is the concentration ratio. Data on product class concentration ratios were obtained from the 1972 Census of Manufacturers, MC72(SR)-2. Four-, eight-, twenty-, and fifty-firm concentration ratios were gathered. The four-firm concentration ratio (CR4) reflects the proportionate share of the market held by the four largest firms in the market; the eight-firm concentration ratio (CR8) measures the proportionate share held by the eight largest firms; and so on. The most frequently used concentration ratios are CR4 and CR8 (Weiss, 1974). Although many studies have examined the relationship between concentration and performance, no theoretical reason has been suggested for assuming that exactly four or eight firms are critical to industry profits (Kwoka, 1979) or to CS/D. Nor is there any empirical reason. It has been demonstrated that study results can actually depend on the particular ratio chosen for analysis (Weiss, 1974). Further, in a simple example, Kwoka (1981) illustrates that despite their high correlation, concentration ratios can have very different associations with a third variable. Similarly, in a 1967 data study (Larson, 1979) it was found that only 61.8 percent of the variance in the

fifty-firm ratio was accounted for by the four-firm ratio. Hence, it would seem that the presence of fringe firms (firms with a small market share) can have an impact on industry conduct. For example, large firms may attempt to discourage expansion of fringe firms by holding down prices (Kaldor, 1935; Pyatt, 1971). Because of the absence of any theoretical or empirical reasons for selecting a particular concentration ratio, all four ratios were used in this study.

Concentration ratios were available for 24 of the 26 product categories in the Best-Andreasen study. Multiple concentration ratios, reflecting multiple markets, were used for 11 of the 24 product categories. These were aggregated by weighting the concentration ratios by the shipment values according to the procedure described by Stigler (1963) and Kaysen and Turner (1959). The data for the exogenous variables are presented in Table 2.

Since concentration ratios assume that the market is national, the geographical scope of the 24 product categories was also examined. If some markets are local, regional or international, adjustments to the concentration ratios may be required. Following Weiss (1972), Shepherd (1970), and Schwartzman and Bodoff (1971), no product category was classified as local, 1 was regional, 15 were national, and 8 were international. The market for pots and pans (plus utensils) was found to consist of two regions. However, because this market is close to being national in scope (i.e., one region), no adjustments were made for local or regional market size.

In order to examine the potential impact of foreign competition, import data were gathered from U. S. Commodity Exports and Imports as Related to Output: 1972 and 1971 (U. S. Department of Commerce, 1979). The

available data are at a 4-digit level, corresponding to that used for the concentration ratios. When 5-digit concentration ratios were used, the ratio of the value of shipments at the 5-digit level over the value at the 4-digit level was used to proportionally calculate an import level for the 5-digit markets. For both the 4-digit and the 5-digit markets, the import data were composed of the value of the imports in the foreign country in U. S. dollars plus any import duty paid.

Data to reflect distribution breadth at the retail level were gathered from the 1972 Census of Retail Trade, Volume 1 (U. S. Department of Commerce, 1976). The merchandise line or lines which had the closest correspondence to Best and Andreasen's product categories were selected. Data were available for 23 of the 24 remaining product categories. The merchandise line data estimate the number of retail establishments which carry a given line of merchandise. For example, 69,232 retail establishments carry furniture as a line of merchandise and 227,986 carry clothing.

Two indicators of consumer cost for the respective product categories were obtained: price and shipment value. Price is a static indicator of consumer cost. Shipment value, which measures industry sales at the manufacturing level, reflects consumer cost in a more dynamic sense. Because there is no reason to assume that small differences in price would be important or linear in their effects, the dichotomous price data provided by Best and Andreasen (1977) were used. Using their classification of products as "usually expensive" or "usually inexpensive," 14 product categories were assigned to the first classification and 9 to the latter. Shipment values at the manufacturing level were obtained for all industries from the 1972 Census of Manufacturers (U. S. Department of Commerce, 1975). The

larger this value, the more consumer dollars that were spent. In this study, total shipment value amounted to approximately $92 billion. With an average markup of 60 percent for physical distribution costs, wholesaling, and retailing, the annual consumer expenditure on these goods would be $150 billion.

Analysis Model

As is well known, Census Bureau data have several limitations. We attempted to overcome these limitations in various ways. First, as discussed above, the data were adjusted where appropriate. Remaining problems were handled by the analysis model. In particular, there are two major problems. First, according to Scherer (1980) industrial organization scholars find it "awkward" to work with several sets of concentration ratios. This problem was resolved by using a model that can handle multiple measures of the same construct. Second, Census Bureau categories (S. I. C.) seldom provide a perfect match with the industries under study, even after weighting. As a result, there is error in the measurement of each concentration ratio variable. This error was explicitly considered in the analysis model, as were other errors in variable measurement.

Errors in measurement were modeled by treating concentration, consumer cost, price dissatisfaction, and nonprice dissatisfaction as unobservables indicated by fallible measures. As with any such model, indicators (i.e., observed variables) can be formative or reflective. If an unobservable is considered to give rise to that what is observed, its indicators are reflective. On the other hand, if an unobservable is assumed to be a result of a combination of observed variables, its indicators are formative (see Fornell and Bookstein, 1981 for a discussion).

In this study, the dissatisfaction measures (y's) are conceptualized as "effects" of dissatisfaction with price (η_1) and dissatisfaction with nonprice aspects (η_2), which are the underlying constructs. Thus, these measures are reflective indicators of consumer dissatisfaction. Accordingly, this part of the model is:

$$\begin{bmatrix} y_1 \\ y_2 \\ y_3 \\ y_4 \end{bmatrix} = \begin{bmatrix} \lambda_{y_1} & 0 \\ \lambda_{y_2} & 0 \\ 0 & \lambda_{y_3} \\ 0 & \lambda_{y_4} \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \\ \varepsilon_4 \end{bmatrix},$$

where the λ's are parameters to be estimated and the ε's are the residuals, and

y_1 = weak price dissatisfaction (with probe),

y_2 = strong price dissatisfaction (without probe),

y_3 = weak nonprice dissatisfaction (with probe), and

y_4 = strong nonprice dissatisfaction (without probe).

For the exogenous part of the model both formative and reflective indicators were used. Industry concentration is treated as an unobservable construct which is reflected in the four concentration ratio measures. Consumer cost is a result of price and outlay over time. Consequently, the indicators of this construct are formative. Since there is only one measure of distribution breadth, the directionality of the indicator is irrelevant. The exogenous variables are thus related to the constructs as:

$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} = \begin{bmatrix} \lambda_{x_1} \\ \lambda_{x_2} \\ \lambda_{x_3} \\ \lambda_{x_4} \end{bmatrix} \xi_1 + \begin{bmatrix} \delta_1 \\ \delta_2 \\ \delta_3 \\ \delta_4 \end{bmatrix}$$

$$x_5 \equiv \xi_2$$

$$\xi_3 = \begin{bmatrix} \pi_1 & \pi_2 \end{bmatrix} \begin{bmatrix} x_6 \\ x_7 \end{bmatrix}$$

where the π's and the λ's are parameters to be estimated, the δ's are residuals, and

x_1 = CR4,

x_2 = CR8,

x_3 = CR20,

x_4 = CR50,

x_5 = # of retail outlets,

x_6 = shipment values (sales at manufacturing level), and

x_7 = expensive/inexpensive dichotomy.

Among the constructs, ξ_1 is defined as seller concentration, ξ_2 is distribution breadth, and ξ_3 is consumer cost. The measurement error for each exogenous variable is indicated by the δ's:

$$\begin{bmatrix} \delta_1 \\ \delta_2 \\ \delta_3 \\ \delta_4 \\ \delta_5 \\ \delta_6 \\ \delta_7 \end{bmatrix} = 1 - \begin{bmatrix} \lambda^2_{x1} \\ \lambda^2_{x2} \\ \lambda^2_{x3} \\ \lambda^2_{x4} \\ \lambda^2_{x5} \\ \lambda^2_{x6} \\ \lambda^2_{x7} \end{bmatrix}$$

where the λ's are loadings (correlations).

All seven hypotheses can be examined simultaneously in the structural model:

$$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \end{bmatrix} = \begin{bmatrix} \gamma_1 & \gamma_2 & \gamma_3 \\ \gamma_4 & \gamma_5 & \gamma_6 \end{bmatrix} \begin{bmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \end{bmatrix} + \begin{bmatrix} \zeta_1 \\ \zeta_2 \end{bmatrix},$$

where the γ's are parameters to be estimated and the ζ's are the residuals.

Estimation

In order to avoid the classical assumptions of multinormality and the necessity of a large sample size, Partial Least Squares (PLS), developed by Wold (1980), was used for parameter estimation. As opposed to classical maximum likelihood procedures, the fixed-point estimation of PLS is distribution-free and can be applied to small-sample-size problems. Each construct (e.g., consumer cost, seller concentration) is estimated via an iterative scheme by a weighted aggregate of its indicators (i.e., observed

variables). The structural parameters are obtained via traditional OLS regressions.

Under certain conditions and identical model specifications, it has been shown that PLS and the commonly used LISREL estimation provide the same numerical results (Fornell and Bookstein, 1981). In general, however, this is not the case. This is because the maximum likelihood principle in LISREL maximizes the probability of the observed data given the hypothesized model, whereas PLS minimizes residual variance.[2]

RESULTS

The results are shown in Figure 1. Since the PLS estimates are standardized, the coefficients relating the constructs can be interpreted as beta coefficients and the coefficients connecting constructs to the observed level are loadings (i.e., correlations). Before the relationships at the unobserved level can be interpreted, the measurement model must be examined in terms of validity. Ideally, measurement residuals should be low and the loadings should have the proper signs. As evident from Figure 1, all of the loadings have consistent signs and most residuals are small. The residuals on the endogenous side are very small. The measurement errors for concentration, on the exogenous side, are also very small. In fact, all constructs are acceptable in terms of Average Variance Extracted (see Fornell and Larcker, 1981). Only the price indicator shows a large residual. This means that price per unit, in this model, is not relevant to consumer cost. Instead, it is industry sales that dominate the consumer cost construct. Thus, with the exception of the price variable, it can be concluded that the measurement model satisfies criteria for convergent validity.[3]

Assessment of the interrelationships among the unobservable variables includes examining the explained variation in the endogenous constructs, the size and sign of the coefficients relating the exogenous constructs to the endogenous constructs, and the significance of these coefficients.[4] The results indicate that explained variance is high: 60 percent of the variation in price dissatisfaction and 54 percent of the variation in nonprice dissatisfaction are accounted for.

Consumer cost and distribution breadth are the most powerful constructs in terms of their effect on consumer dissatisfaction. As hypothesized, consumer cost is positively related to dissatisfaction (both price and nonprice). It was also hypothesized that distribution breadth would operate via product differentiation to affect dissatisfaction. Although no direct measure of differentiation was obtained, the results indicate that this is a plausible hypothesis. Because selective and specialty retail outlets are able to reduce price elasticity, dissatisfaction with price is negatively related to selective distribution (or, as shown in Figure 1, postively related to distribution breadth). Conversely, since mass merchandising trades off quality elasticity of demand for price elasticity, nonprice dissatisfaction is less common in industries with this distribution.

The relationship between seller concentration and consumer dissatisfaction is weak. There is no evidence to support the first hypothesis that more consumers become dissatisfied with price at increasing levels of industry concentration. Since γ_1 is close to zero, the rival hypothesis--that highly concentrated industries have low costs rather than high prices--seems more plausible.

As for the relationship between concentration and nonprice dissatisfac-

tion, the result is not conclusive. The traditional antitrust thesis predicts a positive relationship, whereas the competitive efficiency notion argues for a negative relationship. While the relationship appears to be positive ($\gamma_4 = .07$), it is weak.

In sum, our model does not provide support for the traditional antitrust notion that concentration has an adverse affect on consumer satisfaction or for the argument that concentration reflects efficiency in serving the consumer. In view of the importance of the concept of concentration to legislation and public policy, further analysis was conducted.

With respect to specifying the functional form, it should be recalled that economic theory predicts that prices in oligopolistic markets are higher on the average than prices in competitive markets. The theory presented by Chamberlain (1933) argues that firms recognize their joint interdependence, and raise prices toward the monopoly level. The increase in price is presumed to be discrete rather than continuous. Consequently, the relationship between market concentration and price could be nonlinear. Considerable support for the notion of a nonlinear relationship is found in the literature when four-firm concentration ratios are related to industry profits (see White, 1976; Dalton and Penn, 1976), in particular when four-firm ratios range between 45 and 59 percent (Scherer, 1980), or according to no-fault antitrust, when this ratio exceeds 70 percent. In view of these results, dichotomous cuts were made in CR4, CR8, CR20, and CR50 at the points 55, 70, 85, and 92. Evidence relating to the concept of no-fault antitrust (hypothesis H_{2a}) was examined by rescaling CR4 into a dichotomous variable (either greater or less than .70). The results are found in Figures 2 and 3.

The relationships between concentration and consumer dissatisfaction

are still weak. Nevertheless, the coefficients relating concentration and consumer price problems are negative in both models. Thus, the data on consumers' perceived dissatisfaction provide no support for the theory of discrete price increases. Again, there is no evidence to support a relationship between concentration and nonprice problems. The model in Figure 2 utilizes all four concentration ratios; the estimate of γ_4 is close to zero. The model in Figure 3 limits analysis to a dichotomous four-firm ratio; again the estimated parameter γ_4 is close to zero.

A final model, wherein concentration ratios were adjusted for imports (see Scherer, 1980), was then analyzed. The results presented in Figure 4 are consistent with the previous models. Again, explanatory power is high, measurement errors low, and there is no association between concentration and consumer dissatisfaction.

DISCUSSION

In contrast to most studies of CS/D at the individual consumer level, but consistent with the industry-level analysis by Fornell and Didow (1980), the model presented high explanatory power in terms of accounted variance. Most of the variation in consumer dissatisfaction (with both price and nonprice aspects) in 23 industries comprising well over $100 billion in consumer spending was explained by a few structural variables. Because random error tends to decrease as data become more aggregated, one should perhaps expect stronger relationships at the industry level of analysis. At the same time, it should be emphasized that the principal exogenous and endogenous variables were obtained from two independent data sources: the former from census data, the latter from survey data. A first implication of the study is that

structural variables deserve further attention in CS/D studies, and perhaps also in the general field of consumer behavior.

Distribution breadth and consumer cost were the most potent explanatory constructs. Not surprisingly, when the financial outlay of the consumer is high, the consumer is more sensitive to perceiving dissatisfaction. Among the indicators of consumer cost, however, unit price plays a minor role. Consistent with the notion of "economic man," it is the total expenditure over time (which is indicated by industry sales) that is important.

The results also suggest that distribution breadth is associated with two different types of elasticities. In selective distribution, quality elasticity appears high and the consumer is sensitive to nonprice aspects. The opposite is true for mass distribution where price elasticity is high.

Perhaps the most interesting finding is the weak relationship between industry concentration and consumer dissatisfaction. In antitrust policy, concentration ratios have a long history as the most widely used indicator of inefficient competition. High concentration ratios have been seen as a threat to consumer welfare. Even though several models with different adjustments to the concentration ratios were used, we found no support for the hypothesis that concentration contributes to consumer dissatisfaction. In this sense, the results of this study are supportive of the recent criticism of traditional antitrust policy.

A possible rival interpretation is that antitrust enforcement has succeeded in preventing the creation of substantial market power on the part of a few large firms; what remaining concentration there is has, as a result, no effect on consumer satisfaction. Given this argument, the results of our study, if not directly supportive of traditional antitrust, cannot be taken

as testimony of its lack of justification. However, in the face of available empirical evidence, an interpretation in favor of antitrust is less than convincing. For example, Lewis-Beck (1979) concludes from his study on mergers between 1885 and 1973 that antitrust policy has not worked to protect the competitive structure of the economy. His data suggest that the efforts of the FTC, the Antitrust Division, and the courts have exerted no significant negative effect on anticompetitive mergers.

Nevertheless, the results presented here are not proof that the theories of oliogopoly are false with respect to their assertion about the adverse consequences of market power.[5] But if this assertion is valid, our results suggest either that consumers' experienced dissatisfaction is not affected by market power, or that concentration ratios are improper indicators of market power.

FOOTNOTES

[1] For an alternative interpretation of the PIMS data, see Dholákia and Stern (1976) who contend that these data actually support the antitrust hypothesis of a positive relationship between concentration and market power (i.e., lack of competition).

[2] For a discussion on the fixed-point theory estimation, see Wold (1981). For a description of PLS see Wold (1980). For a comparison of PLS and LISREL, see Fornell and Bookstein (1981).

[3] When the price variable is deleted, the results from models shown in Figures 1 through 4 remain essentially unchanged.

[4] The t-tests are asymptotic and based on the assumption that the errors in the structural equations are normally distributed. Given the sample size and sampling procedures used in this study, statistical inference should not be interpreted here in its traditional sense. Surely, the data base is large and important enough without statistical generalizations. The significance levels presented in the figures do not provide generalization from the sample to a population but they do present some evidence that relationships exist, as opposed to the hypothesis that they are the result of a haphazard arrangement (cf., Winch and Campbell, 1969).

[5] It should also be pointed out that the consumer dissatisfaction data analyzed in this study reflect only the private sector of our economy. No conclusions can be drawn for products provided by the public sector. Certainly, the theories of competitive efficiency are not relevant when organizations are legally protected from competition.

TABLE 1

PERCEIVED PROBLEMS BY PURCHASE CATEGORY

	Category	Weak Problems (with probe)		Strong Problems (without probe)	
		Price Dissatisfaction	Nonprice Dissatisfaction	Price Dissatisfaction	Nonprice Dissatisfaction
1.	Cars	3.0%	18.5%	0.5%	13.8%
2.	Vacuum Cleaners	2.5	14.4	0.0	12.4
3.	Eyeglasses	3.2	8.6	0.7	12.2
4.	Tape Recorders, Stereos	1.2	9.9	0.2	11.0
5.	Washers, Dryers	0.8	12.2	0.0	10.6
6.	Cameras	1.4	6.5	0.3	10.5
7.	Bicycles	1.6	14.9	0.0	10.0
8.	Television Sets	1.6	11.1	0.2	9.7
9.	Calculators	2.0	7.9	0.2	9.1
10.	Floor Coverings	2.3	10.7	0.0	7.8
11.	Air Conditioners	1.1	12.0	0.0	7.4
12.	Tires	4.7	6.2	0.5	5.8
13.	Radios	2.2	8.0	0.0	5.1
14.	Lamps	1.2	5.9	0.0	2.6
15.	Toys	1.9	14.8	0.1	15.9
16.	Clothing	5.5	14.9	0.6	13.2
17.	Jewelry, Wristwatches	0.9	7.8	0.4	12.7
18.	Furniture	3.5	12.2	0.0	11.2
19.	Pots, Pans	2.1	7.0	0.0	9.4
20.	Books, Records	2.5	6.9	0.1	5.8
21.	Blankets, Sheets	3.5	6.3	0.1	5.3
22.	Tools	2.2	6.8	0.3	4.2
23.	Cosmetics	4.7	5.7	0.4	3.5
	Average	2.4%	10.0%	0.2%	9.1%

TABLE 2

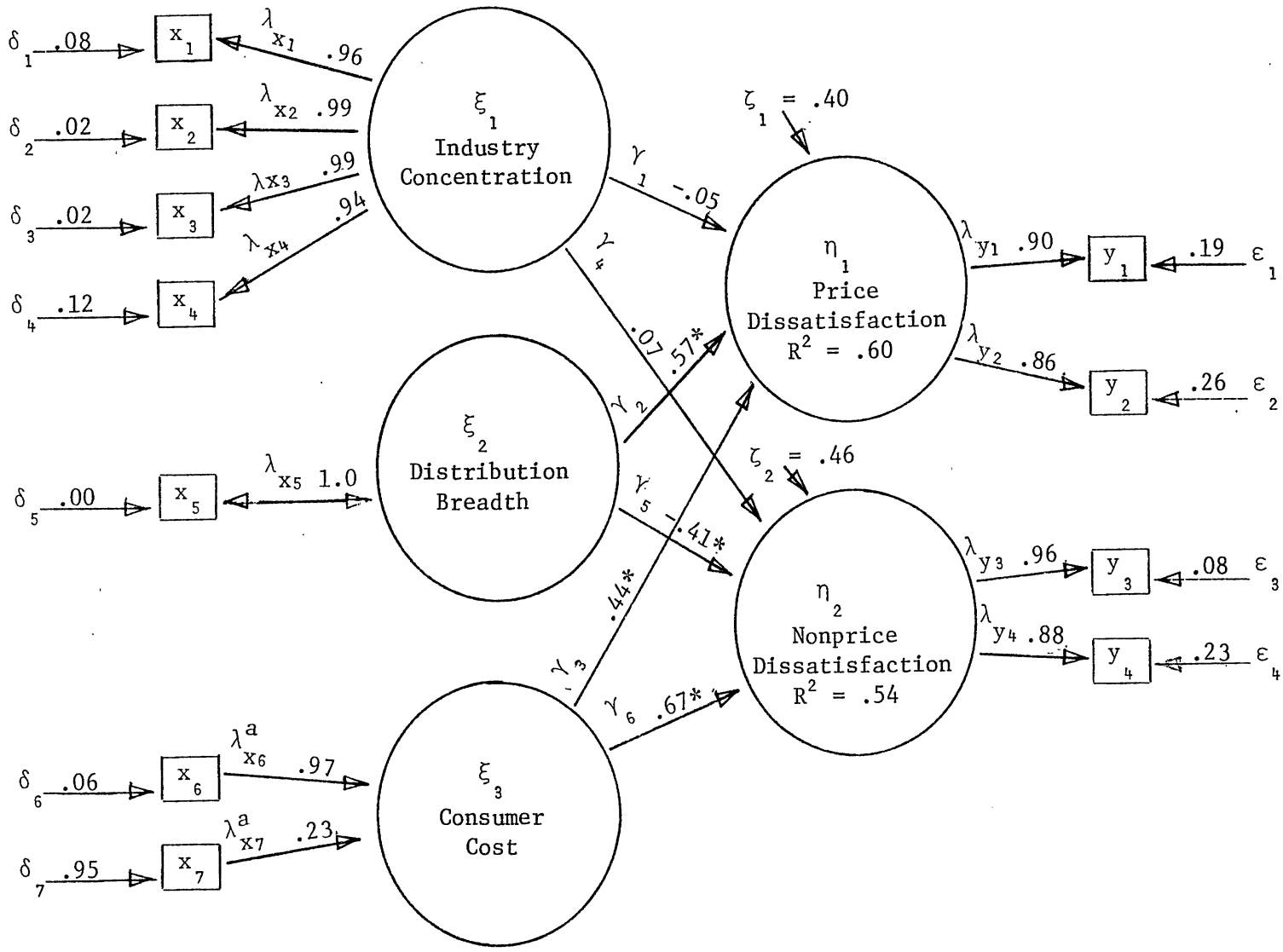
MEASURES OF EXOGENOUS VARIABLES

Category	Concentration Ratios CR4	CR8	CR20	CR50	Distribution Breadth (000's)	Consumer Cost Shipment Value*	Expensive/ Inexpensive
1. Cars	99%	99%	100%	100%	53.0	$29,246	E
2. Vacuum Cleaners	66	86	98	100	41.2	438	E
3. Eyeglasses	50	60	73	86	95.1	481	E
4. Tape Recorders, Stereos	36	51	78	98	99.6	363	E
5. Washers, Dryers	76	95	99	100	76.9	1,287	E
6. Cameras	67	77	90	98	99.6	616	E
7. Bicycles	70	89	99	100	74.6	397	E
8. Television Sets	66	93	100	100	99.6	2,149	E
9. Calculators	68	97	100	100	99.6	226	E
10. Floor Covering	31	44	64	84	63.2	3,245	E
11. Air Conditioners	48	69	90	100	76.9	1,071	E
12. Tires	73	89	97	99	235.1	4,891	E
13. Radios	57	76	96	100	99.6	779	I
14. Lamps	25	32	44	57	117.3	738	I
15. Toys	33	45	60	77	74.6	1,745	I
16. Clothing	23	34	51	69	228.0	24,338	I
17. Jewelry, Wristwatches	13	18	28	43	95.1	984	E
18. Furniture	20	31	48	67	69.2	9,025	E
19. Pots, Pans	54	81	95	99	117.3	389	I
20. Books, Records	21	33	56	77	104.6	3,452	I
21. Blankets, Sheets	23	30	43	60	82.7	1,445	I
22. Tools	42	60	76	91	88.7	435	I
23. Cosmetics	54	70	89	97	139.7	4,245	I
							I
AVERAGE	48%	63%	77%	87%	101.4	$3,999	

* ($ Mil)

Figure 1

Initial Model

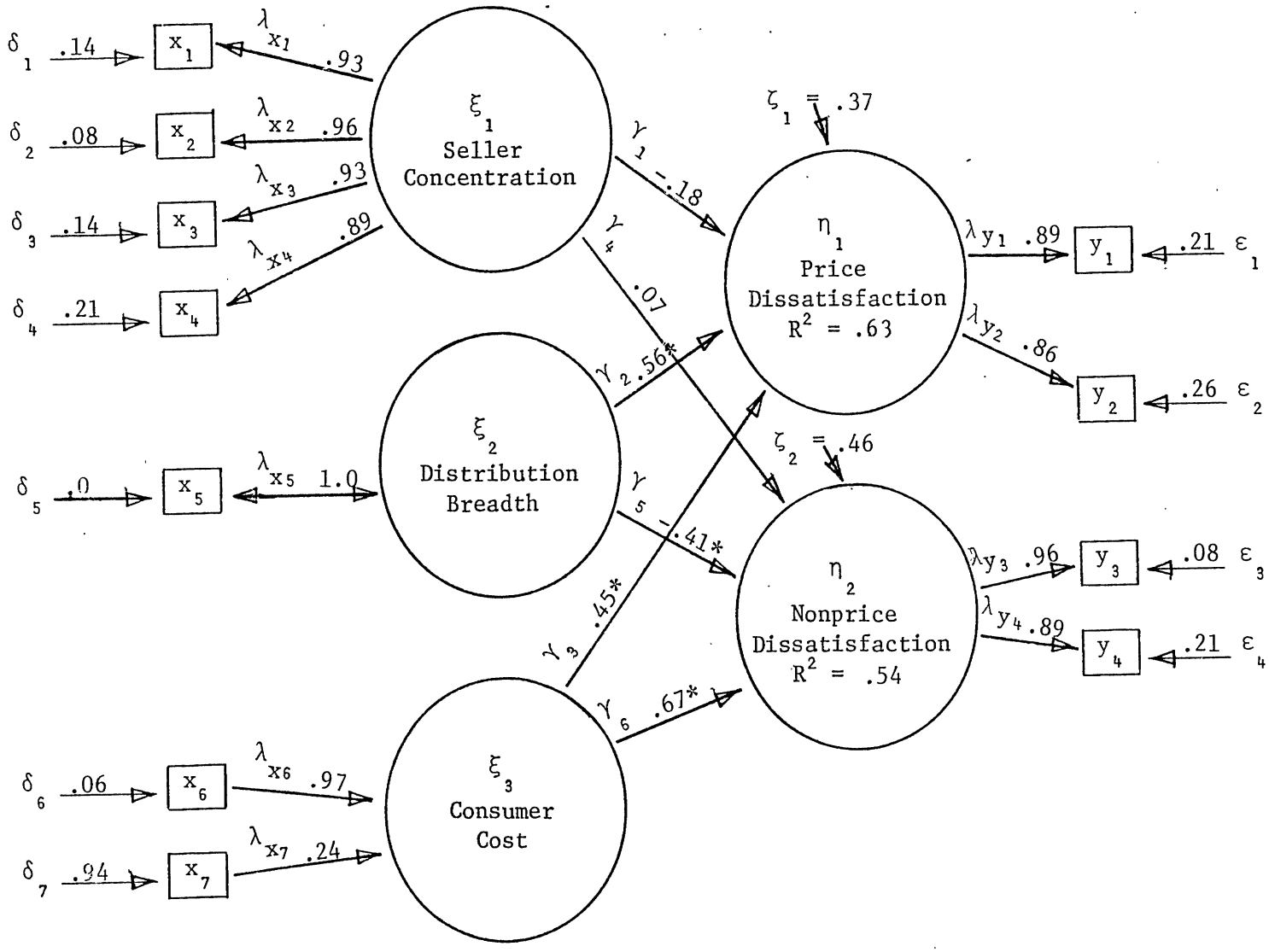


* Significant at .01 (one-tailed test)

a) Computed as: $\underset{\sim}{\Lambda}_X = \underset{\sim}{R}_{XX} \underset{\sim}{\Pi}$ for all models (Figure 1 through Figure 4)

Figure 2

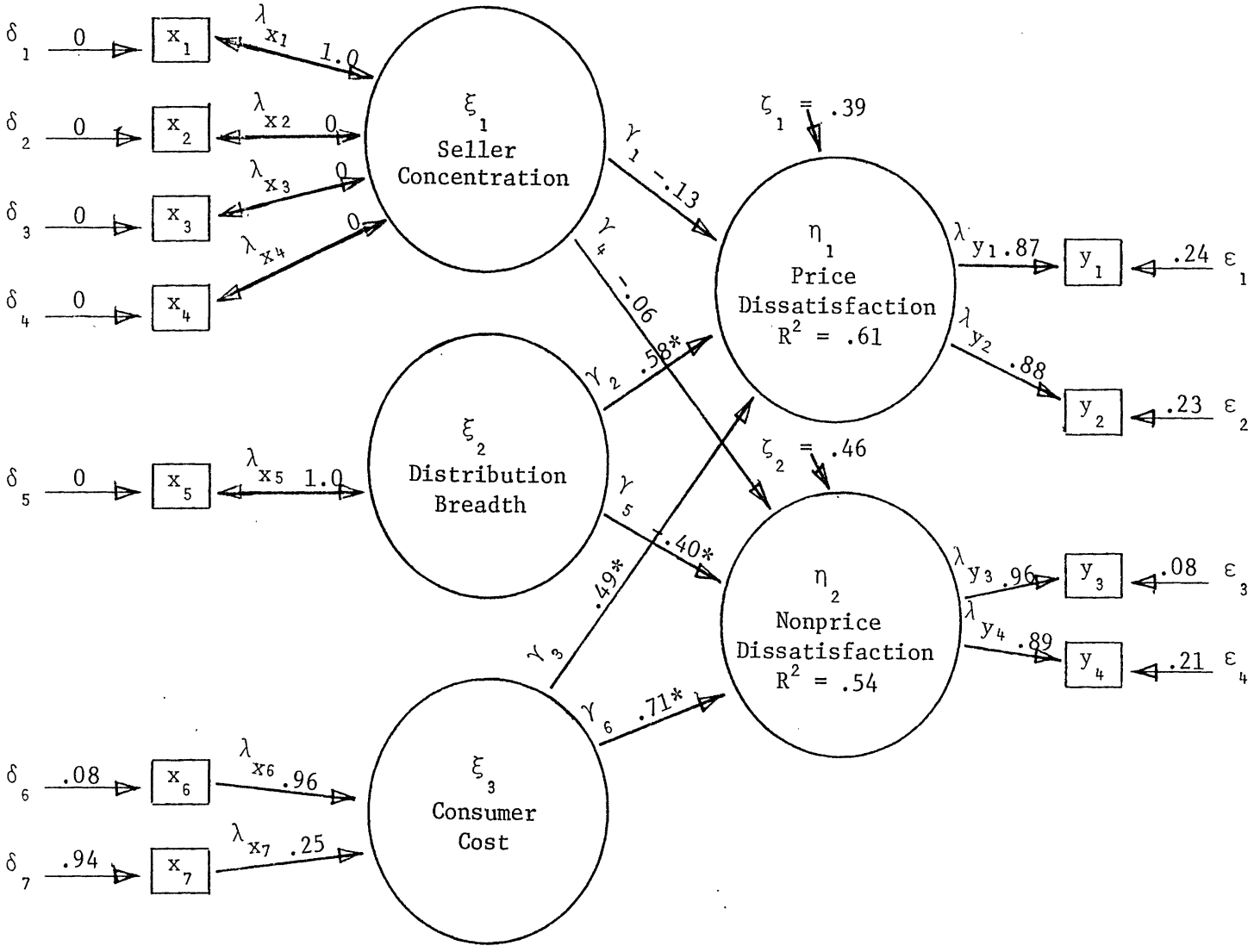
Dichotomous Values for Concentration



* Significant at .01 (one-tailed test)

Figure 3

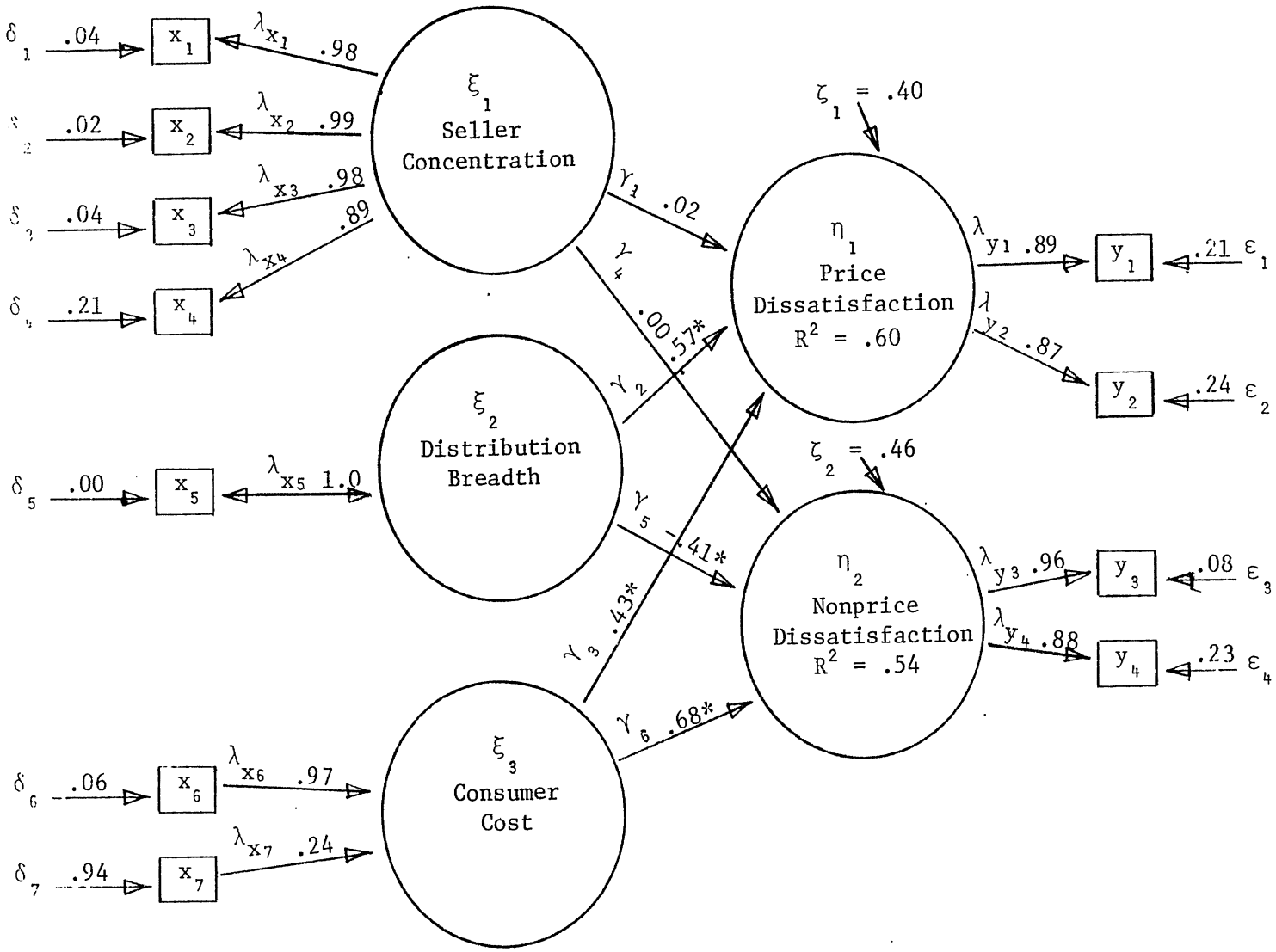
Concentration According to No-Fault Antitrust



* Significant at .01 (one-tailed test)

Figure 4

Concentration Ratios Adjusted for Imports



* Significant at .01 (one-tailed test)

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