AN INTEGRATED MODEL OF CONSUMER COMPLAINT ACTION APPLIED TO SERVICES: A PILOT STUDY[1]

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ABSTRACT

Based on the economic theory of demand, the cost/benefit, restraints, personality, and learning models of consumer complaining behavior are integrated. In either the pre- or post-purchase buying stage, a dissatisfied consumer may demand one or more of the three major complaint actions: public, private, or no action. A recursive logit specification is used to test the model on a pilot sample of 94 dissatisfied consumers. Results indicate that the approach appears viable, and may be used to aid marketers in developing strategies to improve customer service, thus improving the workings of the marketplace. Much work remains, however, on both the theoretical and empirical specifications.

INTRODUCTION

Peters and Waterman (1981) observed, "Probably the most important fundamental that is being ignored today is staying close to the customer to satisfy his (her) needs and wants." In a marketplace full of substitutable and copycat products and services, sellers have begun to focus on customer service as a way to stay ahead of the competition (TARP 1985; Forum Corporation 1988; FMI 1988; Malech 1987; Fornell and Wernerfelt 1987; Mobius 1989). The ability to address consumer complaints is one aspect of customer service that can benefit both the demand and supply sides of the market. Sellers have a chance to address a less than optimal situation by offering consumers who voice their dissatisfaction improved products and services (Cohen 1973; Forum Corporation 1988; Day et al. 1981; Kendall and Frederick 1975). These improvements can ultimately make consumers better off by increasing their satisfaction with purchased goods and services and the companies that sell them. They can make sellers better off by allowing them to retain customers who might switch to the competition if their dissatisfaction is not resolved. This has been called defensive marketing strategy by Fornell and Wernerfelt (1987).

The need has been cited for a comprehensive, integrated model that can predict complaining behavior (Andreasen 1988; Bryant 1988; Herrmann 1988). Such a model might address issues including the effects of economic, socio-demographic, attitudinal, and preference shifting variables on complaining behavior. Information obtainable from an integrated model, including which consumers are more likely to complain, why they complain, and what motivates them to complain, can be used to develop better strategies to "stay close to the consumer".

PREVIOUS WORK

Consumer complaining behavior has been the subject of much research in the fields of consumer behavior, marketing, and law.[2] Conceptual models have been developed (Hirschman 1970; Andreasen 1977: Day and Landon 1977; Landon 1977; Gronhaug 1977). Much of the empirical work, however has been descriptive and focus has been placed on individual elements of the complaint process, such as post-purchase dissatisfaction or seller response to complaints (Cohen 1973; Day et al. 1981; Fornell and Westbrook 1984; Gilly and Gelb 1982; Grim 1987; Kendall and Frederick 1975; Maleck 1987).

Andreasen (1987) has characterized four major categories of models used to predict consumer complaining behavior: the cost/benefit model, the personality model, the learning model, and the restraints model. The personality, learning, and restraints models form the basis for empirical work that includes the connection between attitudes and complaining (Valle and Wallendorf 1977), the importance of political affiliation and community involvement to complaining (Warland et al. 1984), and the link of demographic characteristics and complaining behavior (Duhaime and Ash 1981; Beardon 1983; Morganosky and Buckley 1986). General findings indicate that age, education, income, wealth, community involvement, and political inclination are associated with differences in complaining behavior. Whether consumers attribute dissatisfaction to themselves or others has also been found to affect the complaint actions of consumers (Valle & Wallendorf 1977).

A few researchers have implemented the cost/benefit model, incorporating restraints on complaint behavior through specification of a budget constraint. These researchers considered the impact of prices on complaining behavior or the costs and benefits associated with complaining (Landon 1977; Richens 1981). Other researchers have proposed that economic theory may have merit in helping to explain the consumer complaining process (Hirschman 1970; Fornell and Didow 1980; Oster 1980; Fornell and Wernerfelt 1987).

Fornell and Didow (1980) based their empirical work on that of Hirschman (1970) and hypothesized that complaining behavior is a function of availability of alternatives and the cost of complaining. Results indicated that both number of alternatives available and frequency of interaction between buyer and seller are negatively related to a consumer's voicing of complaints. The economic explanations for these results are 1/ an increase in the number of available substitutes implies that a decreased cost is associated with utilizing substitute products or services, regardless of their price, and 2/ that the more frequent the buyer-seller interaction, the higher the cost of complaining.

Oster (1980) used aggregated data obtained from various sources (Better Business Bureau, Census of Retail Trade, U.S. City Directory) to estimate the number of complaints per thousand transactions within product categories. Consumer oriented independent variables included consumers' product experience, frequency of price changes, the income elasticity of the good, and whether the good is a convenience or non-convenience

good (high versus low involvement). These were proxy variables for other constructs the author found difficult to measure using available data. For example, income elasticity measured a consumer's education and expertise and time cost. Whether a good was convenience or non-convenience goods was a measure of product quality. Price changes were used to measure product price. Company oriented variables were measured by size of company and advertising intensity, where advertising intensity measured information provided and size of firm measures commitment to an industry. Findings included significant and positive effects of price on complaints and negative effects of firm size. The study was clearly exploratory, yet provides insight into variables relevant when taking the economic approach. It also points out the need to include company factors in any analysis of consumer complaining behavior.

Fornell and Wernerfelt (1987) developed a mathematical framework which shows how a firm can benefit by employing a defensive marketing strategy in the case of consumer dissatisfaction. Using examples of duopoly and oligolopy, the authors illustrate the usefulness of the approach. The model, however, was not tested empirically.

An economic framework may be a useful base on which to integrate the personality, learning, and cost/benefit models of complaining behavior. It is possible to build on previous research to develop an integrated model of consumer complaining behavior that can be empirically estimated to explain variation in, and predict when complaints are most (or least) likely to occur. This model can account for dissatisfaction at both the pre- and post- purchase buying stage, and is suitable for both goods and services. Most importantly, it builds aspects the personality, learning, restraints, and cost/benefit models into a single model of consumer demand.

TOWARD AN OPERATIONAL MODEL OF CONSUMER COMPLAINING BEHAVIOR

Occurrences at the pre- and post- purchase buying stage may influence both the purchase and complaint behavior of consumers. Several researchers have conceptualized complaint behavior at the post-purchase buying stage (Hirschman 1970; Day and Landon 1977; Gronhaug 1977; Andreasen 1977). After purchase, consumers compare the product or service purchased with their expectations. Unfulfilled expectations may indicate dissatisfaction, and lead to complaint action. These concepts are easily expanded to include decisions to complain if dissatisfaction occurs during the pre-purchase stage when information about products and services is obtained (Olshavsky and Miller 1972). Consumers compare their expectations about pre-purchase information with the actual information received. This comparison may include the expected versus actual salesperson's "pitch," advertisements, or presentation of terms of purchase (Day and Landon 1977). There may be a discrepancy between the expected and actual occurrences at the pre-purchase phase of the buying process. This discrepancy may influence a consumer's complaint behavior. The pre-purchase phase of the buying process may therefore be an important component of a comprehensive model of consumer complaining behavior.

When consumers are dissatisfied with some aspect of the pre- or post-purchase buying process, there are three major categories of actions that may be taken. These include public, private, or no action (Day and Landon 1977). Dissatisfaction with some aspect of the buying process can result in public complaining to a store or to a manufacturer; complaining to a government agency, such as the Federal Trade Commission, private agencies, such as the Better Business Bureau, or other agencies specifically set up to direct consumers to the appropriate complaint channel; or seeking legal redress. Private complaining by consumers may involve boycotting a store or manufacturer which caused dissatisfaction, or warning others by word-of-mouth "advertising" of the situation which caused dissatisfaction (Richins 1983). These actions are deemed private because sellers are not made directly aware that a consumer has a problem. Finally, consumers may take no action by simply ignoring the situation that caused dissatisfaction.

If a consumer chooses to take some sort of public action, the seller usually has a chance to address the complaint. Once a consumer voices a complaint in some way, the organization complained to should respond. This response may be influenced by factors inherent to the organization, including degree of customer service offered or firm size. It may also be influenced by the persistence of a complaining consumer. The resolution of a complaint by a seller may influence consumers' initial or subsequent purchase of the good or service in question.

If consumers take private action, they may feel satisfaction with "getting the word out" or "getting their frustration with dissatisfaction off their chests." In this case consumers may or may not feel their dissatisfaction has been resolved. The outcome of private complaining may feed into a consumer's purchase decision. With private complaints, the seller has no chance to appease a customer's dissatisfaction. Finally, if consumers choose to take no action, their complaint can not be resolved by any means.

Theoretical Framework

An economic framework can be used to operationalize the above conceptualization of the purchase and complaint behavior of consumers. The demand for complaints depends on "sub-optimal" rather than "optimal" levels of pre-or post- purchase satisfaction. Von Weizsacker's (1971) work on endogenous changes in tastes provides the basis for such a model. A consumer is assumed to maximize a short-run utility function in each of several periods to obtain "optimal" levels of demand. However, after demand is ascertained in any given period, consumers may learn that their behavior was sub-optimal. Consumers then adjust their preference structures accordingly. Demand in subsequent periods, becomes a function of demand in the previous period, prices, and income, given preferences and productivity shifters. Learning may take place in each period, making demand in any period reliant on demand in the previous period.

How can this framework be applied to consumer complaining behavior? First, markets are imperfect. Both information and complaining behavior enter in the model

as means to help both the demand and supply sides of the market reach a more perfect "state of the world". As long as markets remain imperfect, consumers may not realize they have not acted in an optimum way until after behavior occurs.

Clearly, to apply such a model, it is necessary to assume that consumers act as if they maximize a given, short-run utility function in period t. After a certain behavior takes place, if consumers learn their behavior was not optimal, a revised utility function is maximized in period t+1, and so on. For example, consumers may demand some product or service in period t. A seller may attempt a bait and switch tactic, causing the consumer to be dissatisfied. In period t+1, the consumer voices a complaint based on dissatisfaction incurred. In period t+2, the complaint may be resolved, based on complaint action. In period t+3, a consumer's demand for the product or service may be altered, based on the resolution (or non-resolution) of the complaint.

The conceptualized model of consumer complaining behavior suggested implies that the demand for complaints, resolution of complaints, and initial or subsequent demand for goods or services may best be represented by a series of recursive equations with qualitative dependent variables. Therefore, the econometric specification of a simultaneous logit model appears appropriate.

AN APPLICATION TO SERVICES METHODOLOGY

The above conceptual model is applied to the specific situation of consumer complaints about services, including general repairs and services, professional and personal services, and financial services.[3]

Data

Data were collected via a mail survey sent to a simple random sample of 1500 Vermont households during the months of February through April 1989. Dillman's (1978) total design method was employed to promote a high response rate. The questionnaire was developed using a three-step process. First, questions were developed by examining survey instruments of other researchers interested in consumer complaining behavior and the quality of services (Day and Landon 1979; Ash and Quelch 1979; Duhaime and Ash 1981; Day and Bodur 1977; Marketing Science Institute 1985; Berry, Zeithaml, and Parasuraman 1985; Zeithaml 1978). Next, the questionnaire was tested on a panel of experts, skilled in survey research. Finally, the questionnaire was pre-tested using students taking a university level Consumer Motivation course.

The survey consisted of five sections. The first three sections were devoted to collecting information about satisfaction and complaining behavior associated with three major categories of services: General repairs and services, professional and personal services, and financial services. The third section included a list of statements about consumerism, feelings toward the business community, and information search practices of consumers. The final section collected demographic information.

For this pilot study, a random sample of 110 completed questionnaires was chosen from 560 returned. Given time constraints, all the data could not be coded. Therefore, results of this study can be used only to ascertain the viability of the approach and can not be generalized. Of these completed questionnaires, 94 observations included dissatisfaction with a general repair or service, a professional or personal service, or a financial service.

Two models are estimated. The first is a series of two recursive equations that addresses those consumers who choose to complain privately. These are compared with consumers who choose to take no action. In the first equation, the probability of taking private action is estimated. In the second equation, the probability of initial or subsequent demand is estimated, based on private complaint action. Since sellers are unable to directly respond to consumers who take private action, an equation can not be estimated for resolution of the complaint. Summary statistics for the variables included in both of the analyses are provided in Table 1.

The second is a series of three recursive equations and addresses those consumers who choose to complain publicly. These are compared with consumers who choose to take no action. In the first equation, the probability of taking public action is estimated. In the second equation, the probability of resolution is estimated, based on the public complaint. In the third equation, the probability of initial or subsequent purchase is estimated, based on resolution of the complaint.

A Recursive Logistic Model

For the first model, let Y_i, i=1,2, be binary variables and X a vector of independent variables. Consider the model

$$Y_1 = f(X)$$
and
$$Y_2 = f(X, Y_1).$$

Using logistic regression (Aleong 1989),

$$\Pr(Y_1=1) = \exp(X\beta_1)/[1 + \exp(X\beta_1)] \quad (1.a)$$
and
$$\Pr(Y_2=1/Y_1) = \exp(X\beta_2 + \gamma Y_1)/[1 + \exp(X\beta_2 + \gamma Y_1)] \quad (1.b)$$

where $\ddot{a}_1$ and $\ddot{a}_2$ are the vectors of partial regression coefficients. For

$$F(z) = \exp(z)/[1 + \exp(z)]$$

the joint probabilities can be written

$$P(i,j) = \Pr(Y_1=i,\ Y_2=j) \quad i,j,= 0 \text{ or } 1.$$

In particular,

$$P(1,1) = F(X\beta_1)\ F(X\beta_2 + \gamma Y_1)$$
$$P(0,1) = [1-F(X\beta_1)]\ F(X\beta_2) \quad (2)$$
$$P(1,0) = F(X\beta_1)\ [1-F(X\beta_2 + \gamma Y_1)]$$
$$P(0,0) = [1 - F(X\beta_1)][1-F(X\beta_2)].$$

As given in Maddala and Lee (1976), the separate

estimation of (1.a) and the joint estimation of (2) are the same. Let

$$\theta_1 = P(Y_1=1)$$
and
$$\theta_2 = P(Y_2= 1/Y_1).$$

Then (1.a) can be written using the logit link function as

$$\log(\theta_1/(1-\theta_1)) = X\beta_1 \quad (3.a)$$
and
$$\log(\theta_2/(1-\theta_2)) = X\beta_2 + \gamma Y_1 \quad (3.b).$$

Using the method of maximum likelihood the parameters in (3.a) can be estimated. Then, the predicted logits from (3.a) and the method of maximum likelihood can be used to estimate Æ and ä$_2$, with their standard errors in (3.b).

For the second model, let Y_i, i=1,2,3 be binary variables with the joint probabilities

$$P(i,j,k) = Pr(Y_1=i,\ Y_2=j,\ Y_3=k) \quad i,j,k = 0,1.$$

Similar to equation (2), all the joint probabilities can be written. We will just give the separate equations:

$$\theta_1 = Pr(Y_1=1),\ \theta_2 = P(Y_2=1/Y_1) \text{ and } \theta_3 = P(Y_3=1,Y_1,Y_2).$$

The models which are extensions of (3.a) and (3.b) are

$$\log(\theta_1/(1-\theta_1)) = X\beta 1 \quad (4.a)$$
$$\log(\theta_2/(1-\theta_2)) = X\beta_2 + \gamma_1 Y_1 \quad (4.b)$$
$$\log(\theta_3/(1-\theta_3)) = X\beta_3 + \gamma_2 Y_2 \quad (4.c)$$

The estimation method used for fitting (3.a) and (3.b) can be used repeatedly on (4.a) through (4.c).

Empirical Specification

Several independent variables are expected to influence the probability of either publicly or privately complaining. Hypotheses are formed based on economic theory and the findings of previous researchers. Economic influences include price of the service (PRICE), family income (INCOME), employment (EMPLOYED), and number of children under the age of six (YNGKIDS). PRICE and INCOME are expected to have a positive influence on complaints. EMPLOYED and YNGKIDS measure time constraints placed on the respondent. YNGKIDS and EMPLOYED are expected to have a negative influence on complaints.

The size of the company dissatisfied with (SIZE), and whether the company offered some sort of outward customer service (URGE), such as offering a toll-free telephone number to attract consumer comments, or offered a warranty, guarantee, or service contract, measure a possible softening of constraints by sellers that may influence consumer complaint behavior. Based on previous research, SIZE is expected to have a negative influence on complaints. URGE should have a positive influence on complaints.

Learning is measured by age of respondent (AGE), and whether or not a college education was completed (COLL). Persons with a college degree may be better at problem solving, while older consumers may be more experienced at problem solving due to increased experience, or may have decreased abilities, due to old age.

COLL, AGE, URGE, and SIZE may also measure attitude shifters, as these characteristics may influence how a consumer feels about a company. Attitudes are also measured by consumers agreement with the statement, "If consumers voice their opinions, sellers will change their ways," (ATTVOICE) and "Businesses are making it easier for consumers to voice their opinions" (ATTBUS) URGE is expected to exert a positive influence on complaints. Because they may measure more than one construct, no hypotheses are generated for AGE and COLL. Both ATTVOICE and ATTBUS are expected to exert a positive influence on complaining behavior.

If a consumer chooses to complain publicly, resolution of the complaint is possible. The estimated value of PUBLIC, is therefore used as an independent variable in the equation to estimate complaint resolution. Other independent variables include level of consumer dissatisfaction (DISAT), price of the item (PRICE), attitude of the consumer toward voicing complaints (AVOICE), size of the company (SIZE), and whether the company offers customer service (URGE). A company that offers customer service is expected to impact positively on complaint resolution. Size of a company may impact negatively on complaint resolution, since individual customers may be a small portion of the seller's sales. Price may impact negatively or positively on resolution. If the complaint involves replacement of a service, then resolution may be negatively associated with increases in price. However, if price of an item indicates importance of a customer to a seller, it may have a positive impact on complaint resolution. ATTVOICE is expected to have a positive influence on complaint resolution since consumers with this attitude may be persistent in their demand for complaint resolution. No hypotheses are formed about the effect of DISAT. High levels of dissatisfaction may indicate no amount of resolution will satisfy a consumer. Or, it may indicate that sellers might be more willing to accommodate highly dissatisfied consumers. No resolution equation is estimated for private versus non-complainers.

Equations for initial or subsequent purchase were estimated separately for public versus non-complainers and private complainers versus non-complainers. For public complainers, the estimated variable, RESOLUTION, is used as an independent variable. For private complainers, PRIVATE, is used as an independent variable. Both equations included variables representing price of the item (PRICE) and family income (INCOME), both expected in any demand equation. Price should impact negatively on demand, while the effect of income depends on whether the good is a necessity or luxury. Also included is a variable measuring region, either rural or otherwise (RURAL). Rural may impact positively on purchase of a service from the same seller, as there may be fewer sellers in rural areas. Finally, whether the complaint was made at the post-purchase stage of the buying process (POSTPUR) allows identification of whether consumers are more or less likely to make subsequent purchases from the same seller once dissatisfaction after purchase is made occurs. Results of Two Stage (2SLS) Logit analysis for

private complainers versus non-complainers are presented in Table 2, while results for public complainers versus non-complainers are presented in Table 3.

Results

Private Versus Non-Complainers. Overall, the model specifications performed quite well. The estimated model corresponds with equations (3.a) and (3.b) on page 13, derived from the recursive, two equation binomial probability model. From Table 2, for private complainers (PRIVATE), the logit estimator predicted non-complainers correctly in 88 percent of the cases and predicted complainers correctly in 86 percent of the cases. For the second equation in the two equation recursive model, no initial or subsequent purchases (BUYPR) were predicted correctly in 95 percent of the cases. Demanding initial or subsequent purchases were predicted correctly in 93 percent of the cases.

Interpretation of individual coefficients is as follows: what is the effect on the log of the odds ratio of a one unit change in an exogenous variable. In the equation estimating the effect of exogenous variables on the probability of privately complaining (PRIVATE), the expected signs are found on DISAT EMPLOYED, SIZE, URGE, AVOICE, ATTBUS, PRICE, and YNGKIDS. DISAT, and SIZE are both significant. AGE appears to have a significant negative effect on private complaining. In the equation estimating the effect of estimated endogenous and exogenous variables on the probability of making an initial or subsequent purchase (BUYPR), PRIVATE, and RURAL have the expected signs, though only PRIVATE is significant. PRICE is significant and positive, while INCOME is significant and negative.

Public versus Non-Complainers. Overall, the model specifications performed quite well. The estimated model corresponds with equations (4.a), (4.b), and (4.c) on page 13, derived from the recursive, three equation binomial probability model. From Table 3, for public complainers (PUBLIC), the logit estimator predicted non-complainers correctly in 79 percent of the cases and predicted complainers correctly in 77 percent of the cases. In the second equation of the three equation recursive model, non-resolution of complaints (RESOLVE) was predicted correctly in 100 percent of the cases. However, successful resolution of complaints was predicted in only 8 percent of the cases. In the third equation, no initial or subsequent purchase (BUYPUB) was predicted correctly in 91 percent of the cases. Demanding initial or subsequent purchases were predicted correctly in 86 percent of the cases.

The model of public complainers versus non-complainers did not perform as well as the model of private complainers when individual coefficients are examined. In the equation estimating the effect of exogenous variables on the probability of publicly complaining (PUBLIC), the expected signs are found on the exogenous variables DISAT, EMPLOYED, SIZE URGE ATTBUS, PRICE, INCOME, and YNGKIDS were of the expected sign, although only those on EMPLOYED, SIZE, and URGE were significant. In the equation estimating the effect of estimated endogenous and exogenous variables on the probability of a complaint being resolved (RESOLVE), coefficients on PUBLIC DISAT SIZE, URGE, and AVOICE were of the expected sign, but none were significant. In the equation estimating he effect of exogenous variables on the probability of initial or subsequent purchase, coefficients on RESOLVE, POSTPUR, and RURAL were of the expected sign, but were insignificant. The coefficient on INCOME was significant and negative, leading to the first impression that, when a consumer is dissatisfied, the service becomes inferior. Finally, the coefficient on PRICE was significant and positive, which initially is quite disturbing. The implication is that as price rises, dissatisfied consumers are more likely to purchase the service they were dissatisfied with, either initially or subsequently.

USEFULNESS OF THE APPROACH

Information obtained from estimating the equations described above include the effect that the various independent economic, attitudinal, and learning variables, and the relevant estimated endogenous variables have on consumer complaining behavior. Clearly this information could be useful to sellers of goods and services. A trend in providing quality service is emerging on the supply side of the market (Forum Corporation 1988; Grim 1987; Maleck 1987). One way to improve service is to solicit complaints from dissatisfied consumers. By identifying characteristics of consumers who are more or less likely to complain, or to use a particular channel of complaint action, sellers can develop programs to reach consumers who do not voice their complaints or do so in ways that do not reach the seller.

One way to use the estimated results of this study is to actually predict the probability of complaining for each group of consumers (for example, public versus non-complainers and private versus non-complainers) and compare means and frequencies of the independent variables in order to form market segments which may be useful to target with specified customer service programs. Results obtained from predicting the probabilities of public and private complaining are used. Interpretation of predicted probabilities may be made as follows: what is the probability of publicly or privately complaining when all the exogenous factors are considered? Quartile groups of consumers are then formed using the predicted probabilities and summary statistics for all independent variables are calculated for each quartile. Because the cell size for several of the quartile groups are very small, results can be used for exemplary purposes only. Results are presented in Table 4.

Some strategies which might be helpful in designing a successful customer service campaign, and focusing on soliciting complaints from consumers might include:

1. Informing consumers that the seller is interested in providing complete satisfaction, regardless of product price;
2. Providing educational materials to lower-income, and aged households as to how to contact a seller when dissatisfied;
3. Continuing to offer or introducing complaining procedures that decrease the cost of complaining to

consumers, such as toll-free telephone numbers, provision of addresses on documentation of services, or satisfaction guarantees; or

4. Including the assertion that sellers are aware that customer voice is an important aspect of improving market transactions in promotional material.

Many of these ideas are already used by sellers of services. The results indicate that these strategies appear to be useful to those sellers and might prove useful to others who have not yet implemented such strategies.

DISCUSSION

Because this study is only a small part of a larger work in progress, and because the number of observations are few, it is futile to attempt to interpret the individual effects of the estimated coefficients, especially speculation on the disturbing significant coefficients on the PRICE variable. It appears, however, that the approach is viable in predicting consumer complaint behavior and demand for services consumers are dissatisfied with. Results from estimation of the models can be used in the formulation of customer service strategies or to monitor the success of strategies already implemented in the marketplace.

It would appear that a recursive multinomial logit specification might be a better choice than the binomial recursive logit, as all consumers could be grouped and differences between complainers, both public and private, and non-complainers could be identified. The state of the art of recursive logit models, however, has not reached the multinomial stage. Multinomial logit estimates can be obtained for the first equation in the recursive models shown in this research. However, the estimated parameters can not be used in the estimation of subsequent equations in the recursive system at this time. Therefore, at the present, one must be content to study two groups at a time.

Since the approach seems viable, yet requires much refinement, work continues on both the development of the economic theory used as a basis for the approach, the econometric theory used to specify the empirical framework, and on the estimation itself.

[1]This research was funded by the Vermont Agricultural Experiment Station.

[2]For a comprehensive bibliography of research consumcted prior to 1977 see, Robinson (1987); after 1987 see Andreasen (1987).

[3]See Appendix A for a complete list of all service mentioned by respondents.

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Table 1
Summary Statistics for the Dissatisfied Sample

VARIABLE NAME STANDARD	DEFINITION	TYPE	MEAN/ FREQ	STANDARD DEVIATION
DEVIATION				
DEPENDENT VARIABLES				
Y^1 PRIVATE	Private complainer, 0=no; 1=yes	D[a]	36	
Y_2 BUYPR	Purchased service, private complainer 0=no; 1=yes			
Y_3 PUBLIC	Public complainer, 0=no; 1=yes	D	32	
Y_4 RESOLVE	Complaint resolved, 0=no; 1=yes	D		
Y_5 BUYPUB	Purchased service, public complainer 0=no; 1=yes			
INDEPENDENT VARIABLES				
X_1 POSTPUR	Dissatisfied at post-purchase stage, 0=no; 1=yes	D	53	
X_2 DISAT	Level of dissatisfaction 0=other; 1=very dissatisfied	D	42	
X_3 EMPLOYED	Employment status 0=not employed; 1=employe	D	80	
X^4 COLL	College graduate, 0=no; 1=yes	D	64	
X_5 FEMALE	Female respondent, 0=no; 1=yes	D	37	
X^6 RURAL	Rural region, 0=no; 1=yes	D	49	
X_7 SIZE	Company dissatisfied with is large, 0=no; 1=yes	D	42	
X_8 URGE	Company offers some customer service, 0=no; 1=yes	D	43	
X_9 ATTVOICE	"If consumers voice their opinions sellers will change their ways," 0=other; 1=agree	D	74	
X_{10} ATTBUS	"Businesses are making it easier for consumers to voice their opinions," 0=other; 1=agree	D	36	
X_{11} PRICE	Price of item	C[b]	719.67	1960.2
X_{12} INCOME	Family income	C	40163	20716
X_{13} AGE	Age of respondent	C	47.5	12.8
X_{14} YNGKIDS	Number of children under age 6	C	.27	.53

N=94
[a]D = variable is dichotomous and frequency level for those respondents satisfying the condition are presented.
[b]C = variable is continuous and mean/standard deviations are presented.

Table 2
Results of 2SLS Estimation for
Private versus Non-Complainers

	PRIVATE	RESOLVE	INT	POSTPUT	DISAT	EMPLOYED	COLL	FEMALE	RURAL
PRI-VATE			7.18 (3.66)**		1.79 (.90)	-2.30 (2.01)	-2.79 (1.04)***	-.30 (1.0)	
BUY-PRI	-2.5 (1.29)**		-1.27 (1.70)	-161.74 (1762)					1.06 (1.10)

Table 2 (cont.)

	SIZE	URGE	AVOICE	ATTBUS	PRICE	INCOME	AGE	YNGKIDS
PRI-VATE	1.56 (.97)*	.78 (1.07)	1.66 (.13)	-.35 (.97)	.00016 (.0003)	.18E-04 (.223-04)	-.11 (.05)**	-1.7 (1.07)
BUY-PRI					.012 (.004)***	-.59E-04 (.32E-04)		

N=62
***Significant at <.01
** Significant at <.05
* Significant at <.10

LOG-LIKELIHOOD
PRIVATE -21.94
BUYPR -14.76

Table 3
Results 2SLS Logit Estimation for
Public versus Non-Complainers

	PUBLIC	RESOLVE	INT	POSTPUT	DISAT	EMPLOYED	COLL	FEMALE	RURAL
PUBLIC		3.2 (3.38)			.65 (.81)	-2.06 (1.2)*	-.93 (.91)	-.38 (-.79)	
RE-SOLVE	.35 (.25)		-1.2 (.05)**		-.61 (.53)				
BUYPUB		.14 (.20)	1.32 (1.2)	-108.21 (1343)					.60 (.90)

Table 3 (cont.)

	SIZE	URGE	AVOICE	ATTBUS	PRICE	INCOME	AGE	YNGKIDS
PUBLIC	1.52 (.74)**	1.25 (.78)*	-.36 (1.02)	.40 (.83)	.18E-03 (.2E-03)	.14E-04 (.18E-04	.037 (.04)	-.26 (.77)
RE-SOLVE	.38 (.58)	.10 (.55)	.37 (.64)		-.71E-04 (.14E-03)			
BUYPUB					.81E-02 (.003)**	-.57E-04 (33E-04)*		

N=56
***Significant at <.01
** Significant at <.05
* Significant at <.10

LIKELIHOOD
PUBLIC -30.52
RESOLVE -53.96
BUYPUB -16.97

Table 4
Quartile Comparisons of Predicted Probabilities

GROUP:	PUBLIC COMPLAINTS				PRIVATE COMPLAINTS			
QUARTILE:	1	2	3	4	1	2	3	4
ESTIMATED PROBABILITIES:	0-.25	.25-.50	.50-.75	>.75	0-.25	.25-.50	.50-.75	.75
INDEPENDENT VARIABLES:								
POSTPUR[A]	.75	.75	.48	.53	.59	.31	.71	.64
DISAT[A]	1.0	.16	.31	.57	.34	.56	.86	.64
EMPLOYED[A]	1.0	.92	.81	.85	.83	.19	1.0	.91
COLL[A]	1.0	.92	.81	.51	.86	.44	.57	.18
FEMALE[A]	.75	.34	.47	.36	.43	.50	0.0	.36
RURAL[A]	.50	.67	.65	.34	.59	.50	.71	.09
SIZE[A]	0.0	.16	.26	.60	.34	.56	.71	.82
URGE[A]	0.0	.16	.39	.53	.40	.50	.71	.64
AVOICE[A]	.50	.92	.77	.68	.88	.75	.71	.55
ATTBUS[A]	.50	.50	.25	.40	.40	.25	.43	.55
PRICE[B]	181.25	115.16	719.35	928.95	630.81	1008.06	1627.14	191.27
INCOME[B]	31500	28128	39548	44566	40000	40750	49357	34318
AGE[B]	43.25	47.8	48.48	47.3	49.67	46.75	44.42	39.9
YNGKIDS[B]	.25	.41	.32	.2	.34	.19	.28	.00
N=	4	12	31	45	58	16	7	11.

[A]Percentage of the sample fullfilling the condition is presented for these variables measured dichotomously.
[b]Mean value of the variable is presented.

APPENDIX A

I. GENERAL REPAIRS AND SERVICES

appliance/electronic repair
auto repairs
furniture/upholstery repair
heating/air conditioning/plumbing repair
laundry and dry cleaning
mail order companies
contractors
moving and storage
parcel delivery
yard and lawn service
clock/jewelry repair

II. PROFESSIONAL AND PERSONAL SERVICES

services of lawyers
veterinarian services
home security services/private detectives
architects
employment agencies
travel agencies
barber shops/beauty salons/spas
nursing or rest homes
real estate brokers or agents
dentists or dental technicians
income tax preparation
computer dating services
medical doctors/nurses
psychologists
optometrists or ophthalmologists
physical therapists

III. FINANCIAL SERVICES

services of banks or trusts
credit card services
services of savings and loans
services of small loan companies
services of credit unions
services of stock brokers
life insurance
homeowners or renters insurance
medical insurance
auto insurance