

Modeling Consumer Distribution Channel Switching Behavior: The Case of Direct Vs. Traditional Channels

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Based on Becker's (1965) theory of time allocation, this paper develops a formal model to explain consumers' distribution channel switching behavior. Our model suggests that consumers choose among alternative distribution channels on the basis of the relative opportunity costs of time, costs of the goods, pleasure derived from shopping, perceived value of the goods, and relative risk of each channel.

Introduction

With the phenomenal growth of direct marketing and alternative channels, particularly Internet retailing, customers increasingly face the choice of where to purchase goods and services. Despite the large body of research investigating consumers' store patronage behavior, there has been a lack of theoretical development to adequately explain consumers' channel switching behavior between traditional store and non-store direct marketing channels (Dardian 1987; Gehrt and Carter 1992). In light of this knowledge gap and future potentials of non-store retailing, this study attempts to build a theoretical model which explains consumers' choice of distribution channels by extending Becker's time allocation model (1965).

Literature Review

Despite early recognition that retailers may shift work to consumers as vital participants in the transaction process (Barnard 1948; Hollander 1964), there is still relatively little research on the area of work shifting between consumers and channel members. One exception is the model of consumer socialization (Kelley, Donnelly and Skinner 1990) in which the consumer is expected to assume some of the work involved in the retail transaction. The most influential work related to the work of consumers, other than labor force participation (market work), was conducted by Nobel Laureate Gary S. Becker (1965) who developed the theory of time allocation, whereby he formally recognized and modeled the household's role as a producer.

Becker's (1965) theory of time allocation is referred as an integration of the theory of the

consumer with that of the firm (Deaton and Muellbauer 1980). Mathematically, a household obtains utility from the underlying commodities (Z), which are produced using market goods and time as inputs (Michael and Becker 1973). $U = u(Z)$ (1) The technology, by which market goods (X) are used in combination with capital (K) and household's time (L_O) spent in producing Z , is represented as a household production function: $Z = z(X, L_O; K)$ (2) The utility function (1) is maximized subject to the production function constraints (2) and a constraint on the household's available time and income: $T = L_W + L_O$ (3) and $I = PX$ (4) where T is total time available, and L_W is the household's time spent in the labor market; I denotes income and P is a vector of the price of market goods. According to Becker (1965), the time and money income constraints can be collapsed into a single resource constraint on the household's 'full income' (S) $S = W_O T + V = W_O(L_W + L_O) + V = I + W_O L_O$ (5) where W_O is a vector of wage rate of the household member and V is unearned income.

Hence, the utility function (1) is maximized subject to the constraints of the production functions (2) and full income (5). In solving this optimization problem, Deaton and Muellbauer (1980) proposed a two stage approach. At the lower stage, the cost of producing the vector Z is minimized, just as for the firm. The objective is to minimize costs (C) at given technology K and Z . The solution is a function: $C = c(P, W_O, Z; K)$ (6) The upper stage of the household optimization problem is then to choose Z to maximize utility $U = u(Z)$ such that $C = c(P, W_O, Z; K)$ (7) Then, demand function for household produced commodities, Z , can be derived as follows: $Z = z(S, P, W_O; K)$ (8) One of the first models of a person's consumption that build upon Becker's theory in marketing was developed by Etgar (1978). His model indicates that households expend time, effort, and inputs into a production process which determines household consumption through originating activities (i.e., leisure), processing activities (i.e., HP), and the retail purchase of final goods. Nickols and Fox (1983) utilized Strober and Weinberg's (1980) earlier model of time-buying strategies, and found that employed wives tend

to reduce HP and leisure time in response to working. Lusch, Brown and Brunswick (1992) developed a broader model suggesting that both firms and households face the same variables when confronted with the 'make or buy' decision, including the expertise, resource capacity, time capacity, economic rewards, psychic rewards, trust, and control. The first five constructs have also been prevalent in the economics literature, namely human capital, capital, time, economic utility, and psychic income.

Development of an Extended Model

When making purchases, consumers often substitute one distribution channel with another because of the relative household time and effort involved (Dardian 1987; Eastlick and Feinberg 1994). According to Kelley et al. (1990), consumers actually participate in the transaction process at the retail level by acting as 'partial employees', i.e., consumers trade off time and energy to achieve better quality or lower prices at the retail level. Based on the fact that entertainment is an integral part of the shopping experience, many malls are increasing expenditures to encourage customers to drive further and stay longer within the mall. Similarly, consumers utilize many of today's direct marketing catalogs for leisure reading, serving as much more than order expedition devices (Shim and Mahoney 1992).

Although not separately modeled, Becker (1965) suggested that consumers obtain process value from conducting household activities in the form of psychic income as consumers also obtain pleasure, or psychic income, from the shopping experience. Parallel to Deaton and Muellbauer's (1980) optimization, the cost function of shopping involves the opportunity cost of time, the price of the product, quantity of products and it is subject to some capital usage.

The choice of a consumer to utilize one distribution channel over another can be viewed as an optimization problem. Assuming a two channel system, one traditional retailer (i) and one direct marketer (j), it can be shown that consumers will switch between channels when the utilities derived from using one channel relative to costs involved outweigh the same utilities relative to costs for an alternative channel, subject to the full income and capital constraints. Following Becker's logic, the utilities derived from shopping at a traditional retailer versus a direct marketer include the

relative pleasure obtained from shopping experiences, relative prices and quantity purchased as well as differentials in the time involved in the shopping process. These utilities are maximized at a given income, wage rate and available capital, assuming wage rate as an opportunity cost of time (Becker 1965).

If capital is freely available or a low cost viable substitute is available, the capital constraint will not be considered in a marginal decision. However, if there are capital constraints on the shopping process (e.g., lack of transportation to the store) these are likely to have a considerable differential effect. For analytical simplicity, we assume that there is no marginal effect of capital on the choice of channels. Likewise, since full income is relatively constant in both instances (traditional retailer vs. direct marketer), we can assume no marginal effect of the full income variable except that price and time spent might have potential impact on future behavior. For example, if a consumer buys from a direct retailer and saves two hours of time, this time can then be allocated to leisure or work. The value of this time is taken into consideration in the time costs associated with the model.

Since consumer decisions are made at the margin, we can model channel choice by optimizing the marginal benefit subject to costs. The relative marginal costs (RMC) of using one channel to the exclusion of the other is: $RMC = Q(P_i - P_j) + wage(T_i - T_j)$ (9) given that the customer is buying Q number of products at P price levels and inputting T amount of time in the shopping process. The first part of the equation, $[Q(P_i - P_j)]$, represents the direct money cost to the consumer, while the second part, $[wage(T_i - T_j)]$, represents the indirect opportunity cost of the consumer's time. Similarly, if we assume that the same commodities are purchased through either channel, the relative marginal benefit (RMB) to the consumer can be shown to be: $RMB = P_{li} - P_{lj}$ (10) where P_i indicates psychic income. With the assumption of exogenous demand, the only difference in benefit between the distribution channels becomes the psychic income or the pleasure component derived from shopping. The indifference curve between the two shopping channels can be constructed at a point where the relative difference in the net gain between the two channels is zero. Hence, consumers will be indifferent to the channel choice at: $(P_{li} - P_{lj}) - [Q(P_i - P_j) + wage(T_i - T_j)] = 0$ (11) Although this model provides a good start to examining the

process of distribution channel choice, it is restrictive in that the products purchased are assumed to be singular commodities. Furthermore, the previous model does not allow differential risks between channels to be considered, although the shape of the utility function (strictly quasi-concave) assumes a risk adverse consumer. The model becomes more accurate and practical by relaxing these assumptions.

If we first relax the assumption that the products are merely commodities, allowing for product differences such as brands and quality perceptions, we extend the benefit side to include any differential perceptions of value (V) and integrate this into the indifference curve: $[Q(V_i - V_j) + (P_{li} - P_{lj})] - [Q(P_i - P_j) + \text{wage}(T_i - T_j)] = 0$ (12) Moreover, it can be also shown that customers may perceive different risk levels in shopping through different channels. This risk can be modeled by including a risk of loss of the price of a product through the perceived probability of product failure (R) or non-delivery: $[Q(V_i - V_j) + (P_{li} - P_{lj})] - [Q(P_i - P_j) + \text{wage}(T_i - T_j) + (R_i(P_i) - R_j(P_j))] = 0$ (13).

And finally, the assumption that only a single good is bought on a shopping trip is somewhat limiting. Instead, a comparative bundle of goods (1...k) can be integrated to make the model more realistic. Since we still assume a single shopping trip for comparison, the psychic income and opportunity cost components do not change. These two components denote the value or cost of the transaction process as a whole, including access time (e.g., travel time) and shopping time. Hence, the resultant indifference curve of integrating a basket purchase is: $\{[Q_k(V_{ik} - V_{jk}) + (P_{li} - P_{lj})] - \{[Q_k(P_{ik} - P_{jk}) + \text{wage}(T_i - T_j) + (R_{ik}(P_{ik}) - R_{jk}(P_{jk}))]\} = 0$ (14) where the subscript *i* represents a traditional retailer and the subscript *j* a direct marketer. The first component in square brackets is the relative marginal benefits and the second the marginal relative costs to the consumer. The relative marginal benefits include differences in perceived value in purchasing a basket of goods $\{Q_k(V_{ik} - V_{jk})\}$ and psychic income $(P_{li} - P_{lj})$. The relative marginal costs include the cost of the goods $\{Q_k(P_{ik} - P_{jk})\}$, the opportunity cost of the consumers time $(\text{wage}(T_i - T_j))$, and the relative risk of loss $\{(R_{ik}(P_{ik}) - R_{jk}(P_{jk}))\}$.

Implications and Discussion

Two major sets of implications emanate from this model, theoretical and managerial.

While the theory of time allocation has proven quite robust across situations, it does need further examination in the current context. However, further extensions are not limited to the ones presented above. The goal was to provide a basic model which can be adapted to specific situations, rather than a model that is specific to a given situation.

A number of managerial implications can be inferred from our model. Inherently, direct channels have the advantages of lower prices due to shorter channels and lower overhead costs, of consuming less of the customer's time in the transaction process. Moreover, direct marketers also have the advantage of offering nearly unlimited product selection (Darian 1987; Klassen and Glynn 1992). This does not necessarily have to be done by a single direct marketer, but rather the customer should be given the option of buying their ideal basket of goods during a single shopping experience, whether from one or more direct marketers. For instance, if the customer uses the Internet as a shopping medium, time savings in travel alone could be significant. Utilizing on-line shopping, the search and page download time is shorter relative to travel time between stores, particularly when coupled with the latest technology and utilization of search engine or intelligent agent (e.g., BargainFinder) software to customize shopping experience and make efficient price comparisons. The advantage of psychic income from shopping is dependent upon the customer segment, i.e., direct channels tend to attract customers who do not obtain social enjoyment from shopping in a store. Many consumers browse direct channels for fun, deriving additional psychic income from shopping activity (Gehrt and Carter 1992; Shim and Mahoney 1992). On the other hand, direct retailers have the inherent disadvantage in the perceived risk of product failure or non-delivery (Darian 1987; Klassen and Glynn 1992; Schiffman et al. 1976). The perceived risk is correlated with the negative image of the direct marketing industry as many customers still perceive higher levels of fraud and privacy violations from direct marketers than they do from traditional retailers (Garman 1996).

Considering the impact of technological advances on future growth in consumer utilization of direct marketing channels, further examinations of issues pertaining to consumer switching behavior are warranted. As Alba et al. (1997) noted, the lack of understanding of consumer and channel behavior is far more

likely to impede the growth of electronic retailing than the constraints in technology.

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