

# MODELING CUSTOMER CHOICE UNDER RETAIL COMPETITION

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## Introduction

Market share modeling is receiving growing attention as firms engaged in electricity markets look forward (some wistfully, others lustfully) to retail competition. This paper discusses the challenges of market share modeling and discusses some related insights gained from both the analysis of the Massachusetts Electric Company (MECo) residential/small commercial retail pilot and other experiences. As indicated by other papers presented in this session, retail pilots can provide useful information on the implementation of direct access. To some extent, they can also provide insights with respect to customer behavior under retail choice. However, given the unavoidably artificial environment of the retail pilot, conclusions relating to the behavior of customers and suppliers must be made carefully.

## The Need for Market Share Modeling

While many of the players in electricity markets have an interest in market shares, the relevance of market share modeling differs substantially across types of firms. To companies engaged in marketing electricity or affiliated services, market share modeling will play a key role in the development of marketing and pricing strategies. For these companies, which include both unregulated utility marketing affiliates and other non-utility marketers, market share will be a key driver of profitability. Under most institutional arrangements, the distribution company will be indifferent to the market shares of various energy providers. However, the need to act as the provider of last resort will make it necessary for distribution utilities to forecast the share of sales (e.g., standard offer power) for which they will be responsible. Generation companies will typically have the choice of selling directly to marketers under bilateral contracts or to a central pool under least-cost bid dispatch, and will not be directly concerned with retail market shares. Transmission companies, as regulated common carriers offering open access tariffs, will have no direct interest in retail market shares.

## The Challenge of Market Share Modeling

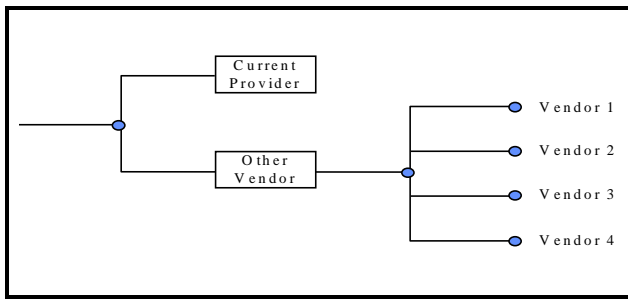
Developing market share models for use in emerging competitive electricity markets presents a serious challenge, for several reasons.

- First, product definitions may be more complex in a competitive setting. Under regulation, forecasting has focused on the sales of electricity, a homogeneous product. Under retail choice, however, products may consist of bundled value-added services including energy services, telecommunications, and entertainment.
- Second, market boundaries are not yet clearly defined. While sales forecasting has traditionally been done for distribution franchise areas, markets may ultimately be defined in terms of broader areas (e.g., regions) or market segments (e.g., retail chain stores).
- Third, the institutional rules for competitive markets are not yet known in many cases. While some states have defined these rules fairly clearly, others are still in the stage of philosophical and conceptual debates.
- Fourth, we have little or no historical data to use for calibrating these models. In order to develop models in anticipation of full retail choice, we are forced to use synthetic data, data from analogous markets, or data from retail access pilots.

In spite of these ambiguities and problems (or perhaps because of them), it is important to begin the process of designing a market share framework and a strategy for implementing it as competition unfolds.

## The Choice Process

Under retail competition, customers will be able to choose among many suppliers, including the local distribution company, which will offer standard power procured from a power pool or other wholesale markets, as well as other vendors. The customer's choice process is illustrated in Figure 1.

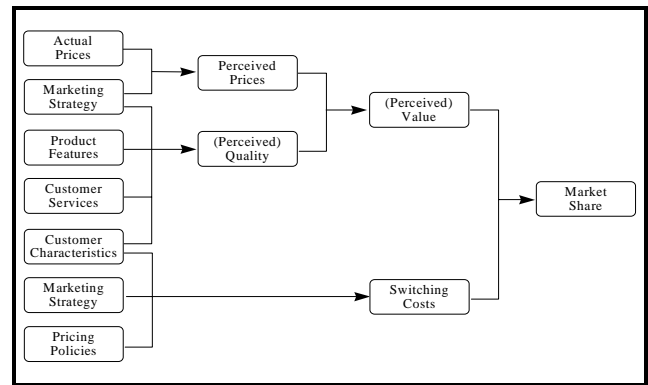


**Figure 1: Customer Choice Process**

As shown, the customer faces a nested choice problem. The higher order choice is to stay with the current supplier or to switch; the lower level choice is the selection of a specific alternative vendor. While these decisions are clearly related, the importance of specific influences may differ between them. In both retail access pilots and at the beginning of full retail choice, the current supplier will be the distribution company and the alternative suppliers will consist of a wide range of utility affiliates and independent marketers and aggregators. As time goes on and switching occurs, of course, the identity of the incumbent supplier will change. The retail pilots provide some information about both of these choices, although, as will be pointed out periodically below, some of the results of these pilots may provide a distorted view of life under full retail choice.

### Overview of a Market Share Model

Figure 2 presents an overview of a market share model. As shown, the two immediate determinants of a retailer's market share are the perceived value of its product and switching costs. Insofar as market shares depend upon customers' assessment of competing options, it should be understood that perceived value refers to perceptions of both the retailer's product and competing products. Perceived values are dependent upon two factors: perceived prices (again, for all competing products) and perceived quality. Price perceptions, in turn, are based on actual prices as well as marketing activity designed to shape these perceptions. Perceived quality, on the other hand, depends on product features, customer service, marketing activity, and customer characteristics (which are linked to the need for various product features as well as the assessment of these features and customer service). Switching costs, which represent a wide range of financial and psychological costs of changing from one provider to another, are affected by marketing and pricing policies, and may vary across customers with different characteristics.

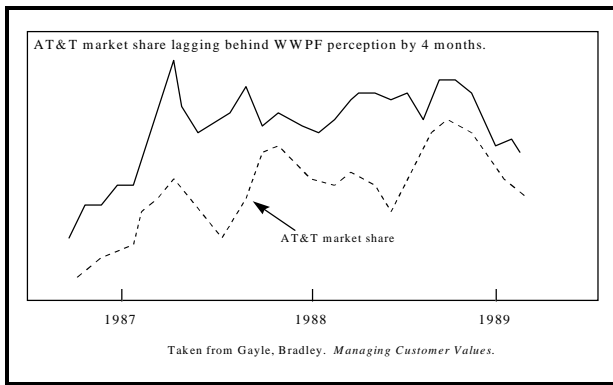


**Figure 2: Primary Determinants of Market Shares**

In what follows, we discuss this market share relationship in more detail. To the extent possible, we use some of the evidence collected from the MECo pilot to assess the importance of some of these factors in determining the participation decision and the choice of specific suppliers.

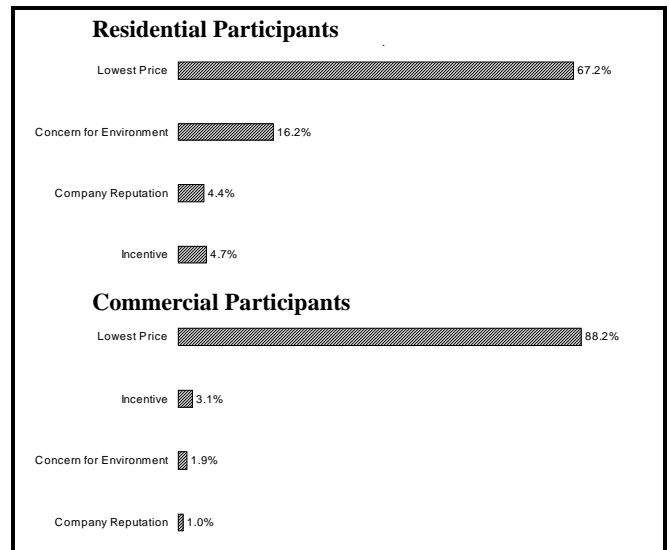
### Value, Quality and Price

Perhaps the most important long-run determinant of market shares will be customers' perception of value of competing options. In the early days of deregulation of the long-distance market, AT&T developed a value indicator called "worth what you paid for" (WWPF) (Gayle, Bradley). Figure 3 depicts the relationship between the average value of WWPF for AT&T's business products, as determined through frequent market surveys, and the company's share of the market four months later. The fit is remarkable, which indicates that perceived value is an important and immediate driver of supplier choice in the telecommunications industry. It is likely to be similarly important for the choice of energy suppliers.



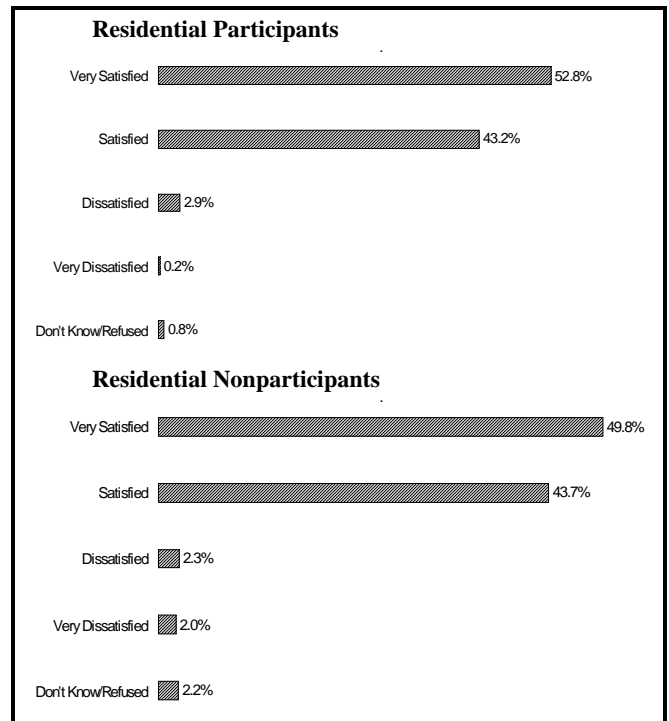
**Figure 3: Customer Value as Leading Indicator of Market Share**

It seems clear that market share modeling will entail the assessment of the key factors driving perceived value, but it is probably too early to tell how important price and quality will prove to be in this regard. However, we can get some insights from our survey of residential participants in the MECo pilot. Figure 4 indicates the primary reasons cited by residential and commercial participants for choosing a supplier. As shown, the lowest price was cited as the primary reason by over 67% of all participants and 88% of all commercial participants. Factors relating to quality of service were mentioned by relatively small percentages of participants. For residential customers, these factors included company reputation (4.7%), reliability and dependability (0.4%), and ease of obtaining information (0.4%). For commercial customers, they encompassed non-price incentives (3.1%), concern for environmental/social issues (1.9%), company reputation (1.0%) and recommendations from public organizations (1.0%). However, the relative unimportance of quality issues may be due to participants' lack of experience with alternative suppliers. Under full retail access, such factors may grow in importance as the base of experience broadens. Furthermore, the relative importance of price in the pilot may reflect the simplicity and transparency of suppliers' prices. It is unclear how complex price offers will be in a deregulated setting. On one hand, evidence suggests that customers will prefer simple price options (flat rates per kWh). On the other hand, it is not in sellers' collective interests to simplify price, insofar as this would tend to accentuate price competition and drive down margins. In spite of the attractiveness of simple prices to customers, customers may be faced with a wide range of price options, distinguished by time of use structures, contract length, and buyout/termination provisions. The more complex these pricing structures, the more important non-price issues will become and the looser the relationship between actual and perceived prices.



**Figure 4: Primary Reason for Choosing Supplier**

Many utilities are conducting satisfaction surveys in an attempt to assess perceptions about value. It is important to note that satisfaction with service offered by a customer's present supplier, by itself, is not a particularly good predictor of willingness to switch vendors. Figure 5 illustrates the level of satisfaction with MECo's electricity service expressed by residential participants and eligible nonparticipants. As shown, satisfaction levels were high in both groups; indeed, participants were actually slightly more likely to be very satisfied or satisfied with MECo's service than nonparticipants.

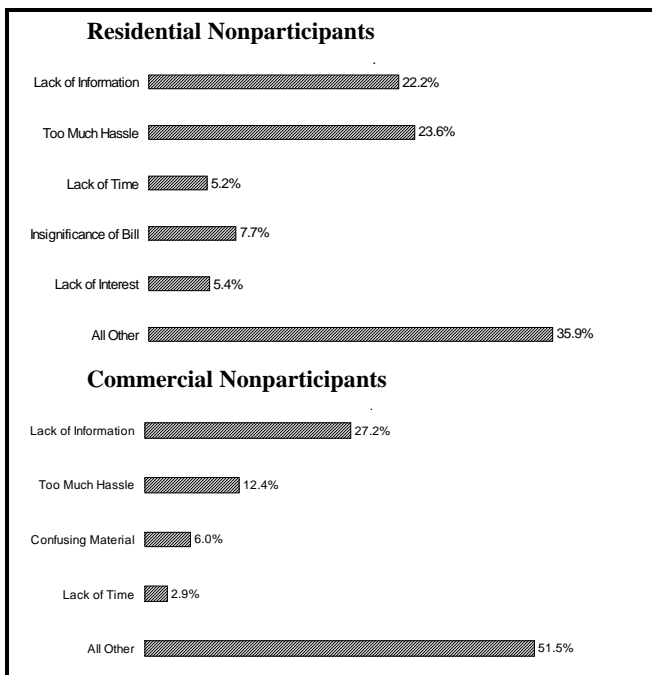


**Figure 5: Program Satisfaction**

## Switching Costs

Switching costs play a strong role in market share analysis in a wide range of industries. In general, these costs relate to the decision to switch from a current vendor, rather than to the selection of a specific alternative supplier. These costs can be one-time costs associated with the first instance of switching (e.g., the costs of collecting information about alternative suppliers), or recurrent costs incurred with every switch (e.g., paperwork). Switching costs can be exogenous (i.e., unaffected by supplier behavior) or endogenous (created by sellers). Examples of endogenous switching costs include contractual penalties for early termination as well as a variety of inducements for remaining with the supplier. In the MECo pilot, MECo made no attempt to impose switching costs; however, time costs may have acted as barriers to both the initial decision to participate and the ultimate choice of a vendor.

Figure 6 presents the primary reasons cited by nonparticipants for not participating in the pilot. For residential customers, many of these reasons qualify as switching costs, including lack of information (22.2%), too much hassle (23.6%), lack of time (5.2%), insignificance of the bill (7.7%), and lack of interest (5.4%). Commercial customers were somewhat less concerned with switching costs as a whole, but a significant percentage did list lack of information (27.2%), too much hassle (12.4%), confusing material (6.0%) and lack of time (2.9%) the primary reason for not participating.



**Figure 6: Reasons for Not Participating**

To overcome switching costs and to influence their selection as an alternative vendor, suppliers may provide switching inducements. Long-distance firms, for instance, are notorious for engaging in this practice. In the MECo pilot, a variety of inducements were offered to customers, including charitable donations, conservation measures, electric vehicle raffle tickets and free business promotional services.

## Implementation of the Market Share Model

Several steps are necessary for the implementation of a market share model. These steps are considered below.

### Model Specification

First, the market share model must be specified in conceptual terms. This entails the definition of the product and the market of interest, as well as the stipulation of the key determinants of market shares. Second, the model must be designed to reflect the specific customer choice under consideration. This may entail the use of a nested choice model (which would characterize the choice problem shown in Figure 1), a binary choice model (which could be used if a single binary choice were being modeled), or a multinomial choice framework (applicable to a situation where choices among many highly substitutable options are being analyzed). It also includes the stipulation of dynamics, since market changes are a dynamic process. Dynamics can be captured through a variety of specifications, including distributed lags, partial adjustment processes, or transition probability frameworks.

### Segmentation

Segmentation is an important step in the implementation of a market share analysis. In the context of this kind of analysis, segmentation is needed for two reasons. First, customers may have very different needs, so product features and marketing strategies may differ sharply across segments. Second, different customer classes may face different options. For instance, large industrials or chain accounts may be offered more desirable price packages than small commercial customers. Third, model parameters may differ across segments. For instance, some segments may be more price sensitive than others, or more susceptible to certain marketing approaches. While other approaches are possible, it probably makes sense to develop separate market share models for individual segments.

### Data Collection

Once the key variables have been identified, data collection will have to begin. This is not as easy as one might think, for several reasons. First, competitors' prices, which should be important determinants of market share, may not be readily available. Indeed, except for the distribution company, firms will not generally have access to information on competitors' market shares. Second, to the

extent that perceptions are important drivers of customer behavior, frequent market research may be necessary to track these perceptions.

### **Parameterization**

At this point, parameterization is a particularly difficult process. The estimation of model parameters typically entails the use of some type of regression analysis, but this technique requires data on the variables in the model. Insofar as retail access is not yet a reality in the U.S., historical data have not yet been generated to support the estimation process. Three admittedly imperfect options are available prior to the advent of retail access:

*Synthetic Data.* One option is to collect survey data on hypothetical customer choices under alternative market conditions. Discrete choice techniques can be applied to these data can be used to develop choice models. While survey-based exercises can be extremely useful in revealing tradeoffs across product characteristics (e.g., price and environmental effects, or price and reliability), they suffer from a variety of problems. First, they assume full awareness of market conditions, something that is seldom if ever achieved in reality. For example, our assessment of the MECo pilot suggested that only 39% of eligible commercial customers and 40% of eligible residential customers were aware of the pilot. Second, they may be biased by the hypothetical nature of the survey setting. And third, they may be affected by strategic bias if respondents feel that their responses may affect market options.

*Analogous Markets.* Data on customer behavior in analogous competitive markets (e.g., telecommunications, gas, British electricity) can also be analyzed to obtain some insights with respect to customer choice behavior. Clearly, the evolution of market shares in other recently deregulated markets provides some insights about the likely transition that will occur in power markets, and this kind of information can be used to “bound” the predictions of a market share model and to benchmark some key parameters. However, these markets do not yield the kinds of data that can be used to fully parameterize a market share model.

*Retail Pilots.* As noted earlier, customer actions under retail pilots may provide a preview of behavior under full retail choice. However, we need to be cautious in our interpretation of the data from these pilots. By design, pilots tend to be artificial settings. In the MECo pilot, for instance, awareness was limited in spite of the attempts of both MECo and other players to inform eligible customers. Moreover, the range of participating suppliers was limited, as were the types of price offers. Further, price offers may be artificially low if suppliers view the pilot as a testing ground and/or an opportunity to establish themselves as players.

### **Application**

The application of the market share model is different in some respects from the use of typical forecasting models. The first difference relates to competitors’ behavior. In a traditional forecast setting, we treat our drivers (explanatory variables) as given. In market share modeling, however, our assumptions with respect to competitors’ prices and marketing intensities cannot be treated as exogenous. Instead, these values will depend upon our own behavior. This interdependence of competitive strategies make take us into the realm of game theory. Clearly, it will complicate the forecasting process. The second difference relates to auxiliary issues raised in the market share modeling process. If the model is designed to predict share on the basis of customer perceptions of value, it will also be necessary to model the impacts of actual prices, product features and marketing efforts on these perceptions. Clearly, market share modeling will present a challenge to those who are charged with the responsibility.

## **The Research Agenda**

Retail competition is only a few months away in some states. Developing a market share framework to use in this setting will require an action plan with the following steps:

- First, identify the relevant business units, objectives, and products/services.
- Second, define the specific role of market share analysis for each potential application
- Design a market share modeling framework, including segmentation design, specification of key factors, representation of market dynamics, and other features.
- Develop preliminary parameters, using survey research, analysis of pilot data, examination of other industries, or pure old fashioned judgment.
- Develop a strategy for refining these parameters, including data collection and analysis techniques.

The long-run research agenda, of course, will require the continual refinement of the framework and its application to the development of marketing strategies. While a variety of data sources like retail access pilots can provide insights into some aspects of customer choice, the true test of a market share model will be its ability to describe customer behavior in a fully competitive strategy.