

Strategic pricing using discrete choice models

Technote

Pricing decisions are difficult

Pricing a new product or service, or deciding whether to adjust the price up or down, is one of the most important decisions made in business. Price too low, and you give up revenue. Price too high, and your customers leave.

Many use trial and error approaches to pricing. Watch the inventory: if it disappears quickly, you may have priced it too low. In a restaurant, empty tables may mean prices are too high; conversely, it could also mean poor food and service. Others follow the leader, either out of habit or because they fear customers will switch instantaneously if competitors cut prices.

In reality, most markets are more complex, and research can help clarify the options. Discrete choice modeling (DCM) offers a tool to improve understanding about pricing options.

Market research can offer a rigorous approach to pricing decisions

Several market research methods exist to evaluate pricing. Conjoint analysis can be used to evaluate the demand for a good or service, using price as one of the attributes. See our related “Technote” at <http://www.pra.ca/> Another approach is to use survey questions that probe for consumer opinion on “the most he/she would pay for X,” and “the lowest price that the consumer would pay and still believe that a quality product was being delivered.” Some questions involve a form of auction, where willingness to purchase is tested at progressively higher prices. DCM represents a very effective price testing process that is easy to implement.

Pricing using DCM

DCM uses a standard self-administered survey design, such as conventional mail, e-mail, or telephone. The key idea is to randomly allocate the sample to at least three subsets. A common approach in a mail survey is to create as many questionnaire versions as price subsets. Each questionnaire version is identical except for the price-testing question, “would you buy X for \$Y dollars?” with the typical response being a simple “yes/no.” The analysts must select the price points to be tested, which requires some subtlety, as explained below. A more complex approach is to ask “how much of X would you buy for \$Y?” where “none” is a possible response. In the latter approach, the analyst collects data on price and quantity purchased.

Typically, the price testing occurs within a larger survey, as shown in Figure 1. All respondents start the questionnaire; each subset then responds to a different price test, and finally, all respondents complete the remaining questions. This subsetting is easy to accomplish in a telephone (CATI) interview. In a mailed questionnaire, one needs to number (or otherwise distinguish) the questionnaires to randomly allocate the versions to each subset. Ensuring a minimum number of respondents needed for each subset is also important. In practice, a minimum of 100 completions offers some reliability; reaching 250 per subset provides improved reliability of the results.

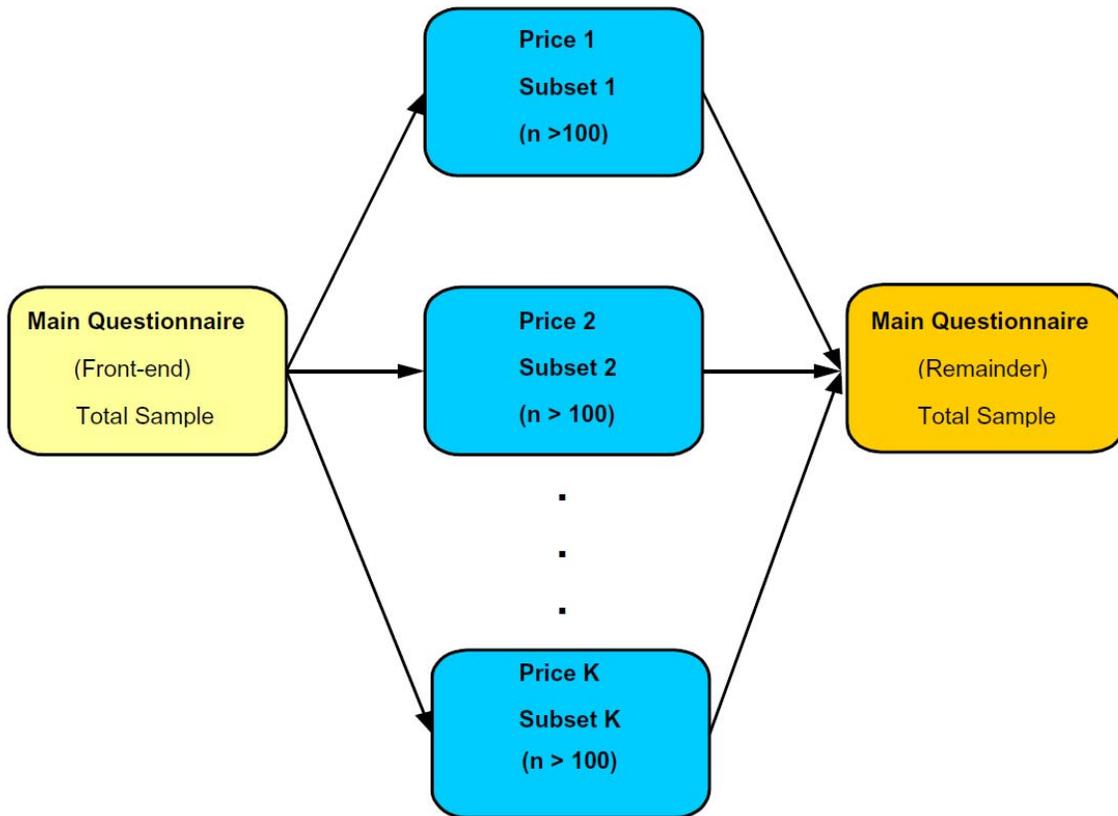


FIGURE 1

By simply recording the percentage of “yes” responses at each price, a standard demand relationship emerges (as shown in Figure 2). The higher the price, the fewer the number of “yes” responses.

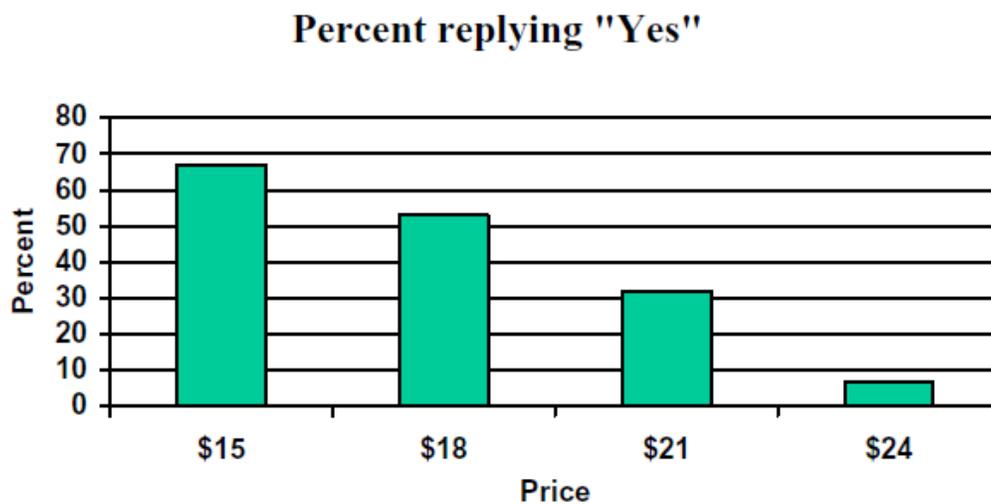


FIGURE 2

A next step is to multiply the numbers who commit to buy at a given price by this price, to show how price relates to total revenue, as shown in Figure 3.

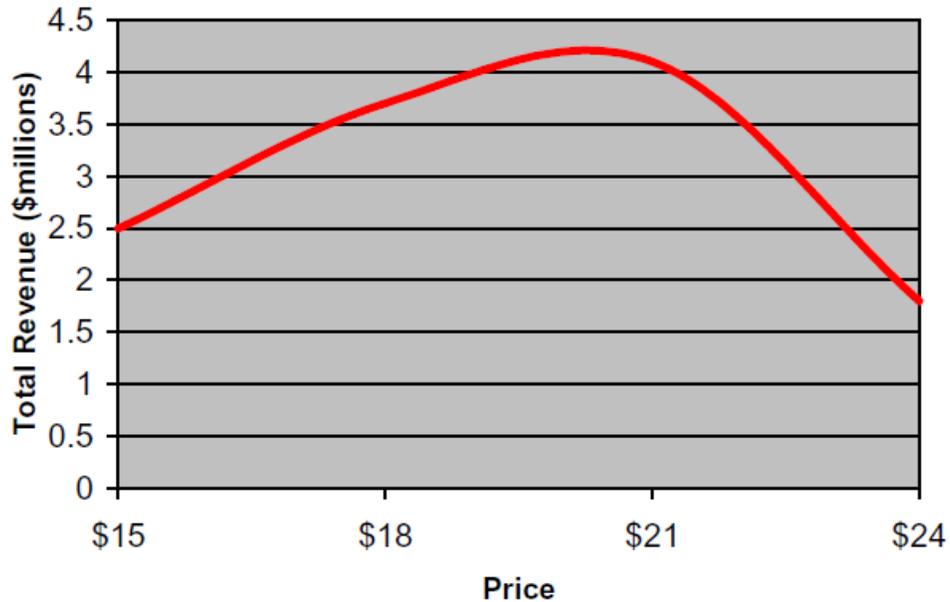


FIGURE 3

The peak of total revenue is the optimum price.

Potential pitfalls in DCM approaches to pricing

DCM offers considerable potential in pricing decision, but some caveats are important:

1. The consumer must be familiar with the general product area. Frequent purchasers can offer very precise reactions to potential price changes. When the researcher wishes to test a new product, or even new features of an established product, consumers become less able to indicate whether they will purchase. Much of the research effort goes into increasing the “salience” of the choices.
2. The optimal price may not be the point of maximum profitability, or even the breakeven point. Further, this experiment does not include strategic reactions from the competition. For Figure 3, the optimum price (about \$20) needs careful interpretation. One can increase the complexity of the experiment by using a question such as “would you purchase ‘X’ at \$15 if ‘Y’ were offered at \$17?”
3. DCM offers a powerful way of reducing strategic bias, where the respondent guesses the purpose of the survey and “bids” low in the hopes of influencing the decision of the researcher. If respondents are very knowledgeable, they can still refuse “reasonable” prices in the hopes of upsetting the research.

4. Perhaps the most difficult feature of DCM is to select proper price ranges. Figure 4 shows what happens when one fails to include a sufficiently low option. No optimal price is apparent, and the researcher should have offered a lower price range. However, suspiciously low prices may raise questions about quality, particularly among well informed consumers (i.e., farmers rating the price of herbicides, or technologists rating the price of computers). This is why pre-tests are so important.

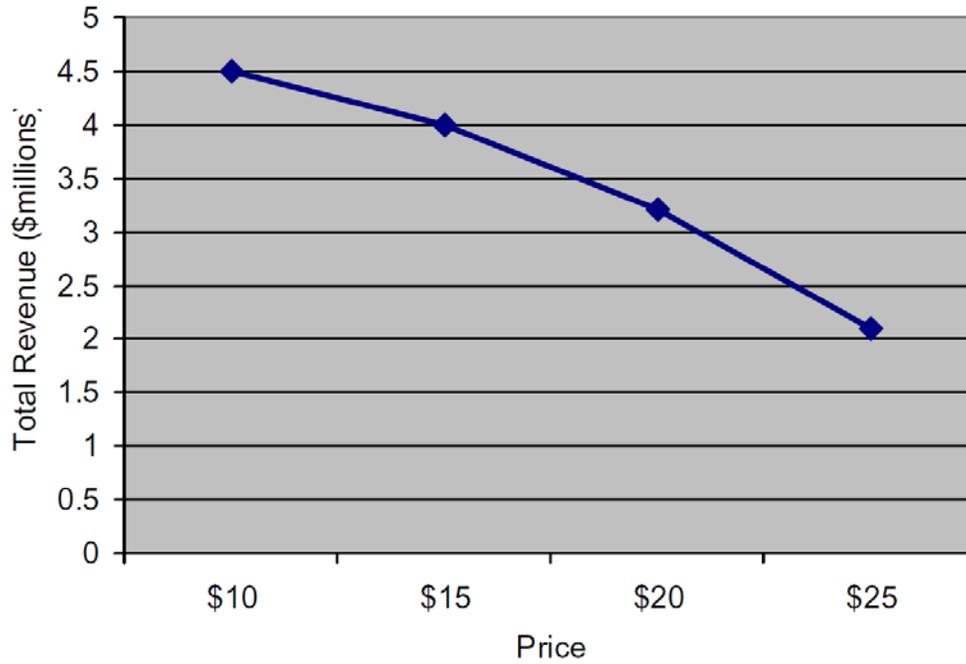


FIGURE 4

**For additional information, please contact
admin@pra.ca**