



THE USE OF CONJOINT ANALYSIS TO SUPPLEMENT PRICING DECISIONS

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An Overview of Conjoint (Trade-off) Analysis

Estimates of customer price sensitivity and willingness-to-pay can sometimes substantially improve both price setting and segmentation. In some situations, research can provide very specific estimates of the impact of prices on sales volume. Other times estimates provide only a rough indication of a customer's willingness-to-pay given a set of circumstances. There are numerous procedures for measuring and estimating price sensitivity. Each procedure offers particular advantages over the others in terms of accuracy, cost, and applicability, so the choice is not arbitrary. Conjoint (or trade-off) analysis has become popular for measuring price sensitivity as well as sensitivity to other product attributes. The particular strength of conjoint analysis is its ability to disaggregate a product's price into the values consumers attach to each attribute. Consequently, conjoint analysis can help a company identify the differentiation value of unique product attributes and, more important, design new products that include only those attributes that consumers are willing to pay for. Currently, conjoint analysis aids in the design of a range of products, from automobiles and office equipment to household cleaners and vacation packages.

The basic data for conjoint analysis are consumers' answers to questions that reveal not their directly stated purchase intentions, but rather the underlying preferences that guide their purchase intentions. The researcher collects such data by asking respondents to make choices between pairs of fully described products or between different levels of just two product attributes. The products are typically designed to systematically vary in the levels of certain attributes that define the product. When multiple levels of price are included in the study design, it is possible to not only assess the value assigned to certain product attributes, but one can also arrive at an estimate of price elasticity.

After obtaining a consumer's preferences for a number of product or attribute pairs, the researcher then manipulates the data to impute the value (called utility) that each consumer attaches to each product attribute and the relative importance that each attribute plays in the consumer's purchase decision. With these data, the researcher can predict at what prices the consumer would purchase products containing various combinations of attributes, including combinations that do not currently exist in the marketplace. The researcher can also estimate how much of one attribute the consumer is willing to trade off in order to obtain more of another attribute—for

example, how much more price a consumer is willing to trade off in order to obtain more fuel efficiency in a new automobile.

With similar data from a number of consumers who are representative of a market segment, the researcher can develop a model to predict the share of a market that would prefer any particular brand to others at any particular price. Consumers' preferences can be predicted, or interpolated, even for levels of price and other attributes not specifically asked about in the questionnaire, providing the attributes are continuously measurable and bounded by the levels that were asked about in the survey. Segmentation in the sample of respondents is needed to understand how some groups of individuals have higher values for some attributes than others. Failure to segment the respondents into high- and low-value groups often hides the true nature of price and value sensitivity in the population.

However, conjoint analysis does have limitations and it is useful to contrast it with other direct questioning methods. By having respondents evaluate a product in its entirety rather than in the more abstract form of individual attributes, responses are more likely to mimic actual choices. For example, in a study of recent MBA graduates, when asked about individual job attributes, the most important was the people and culture of the company. Salaries were rated low on the list of attributes under consideration. However, when studied in an environment where respondents were given job descriptions to choose from, analysis revealed that salary was the most important job attribute, followed by the region and location of job; people and workplace culture only ranked fourth most important. Perhaps the respondents behaved more altruistically when attributes were evaluated—and recorded—separately, but when presented with more realistic job choices, conjoint combined with direct questioning allowed for a more accurate evaluation of preferences.

Of all methods used to estimate price sensitivity from preferences or intentions, conjoint analysis promises the most useful information for strategy formulation. The researchers can do more than simply identify the price sensitivity of the market as a whole; they can identify customer segments with different price sensitivities and, to the extent that those differences result from differences in the economic value of product attributes, can also identify the specific product attributes that evoke the differences. Consequently, researchers can describe the combination of attributes that can most profitably skim or penetrate a market. The economic value of a product can also be identified even when the product is not yet developed by presenting consumers with different experimental product combinations in the form of pictorial and descriptive product concepts, or new product prototypes. With the use of more advanced modeling techniques, researchers are able to use an adaptation of conjoint analysis, discrete choice analysis, in which consumers are given either a limited number of choices or a wide range of choices of different product packages from different competitors, all often at different prices. Based on the analysis of their choices, researchers are then able to form segments by grouping consumers based on the similarity of their responses and develop estimates of market share based on the size and responsiveness of the different segments. Given internal costs and external promotions, the models can predict likely levels of profitability given those customer and competitive responses.

Because conjoint analysis measures underlying preferences, the researcher has the ability to check if an individual consumer's responses are at least consistent. Consumers who are not taking the survey seriously, or who are basically irrational in their choice processes, are then easily identified and excluded from the sample. There are three separate studies that show a high degree of consistency, or reliability, when subjects are asked to repeat a trade-off

questionnaire a few days after having taken it initially. Since the subjects are unlikely to remember exactly how they answered the questions in the earlier session, the consistency of the answers over time strongly suggests that they do accurately reflect true underlying preferences. More comforting is the result of a study showing that the exclusion from the questionnaire of some product attributes a subject might consider important does not bias the subject's responses concerning the trade-offs among the attributes that are included. Although conjoint analysis is more costly than a simple survey, it also provides much more information. Given its relatively low cost and the fact that it has met at least some tests of reliability, it certainly warrants consideration when seeking to develop a product with features that can be priced most profitably.

Using Conjoint Appropriately

There are, however, a number of reasons why a prudent manager might suspect the reliability of this technique for some markets. Conjoint analysis is only as good as its ability to predict actual purchase behavior and because the analysis is an experimental (not actual) research technique, it introduces bias to the extent that it does not simulate the actual purchase environment. The respondent taking a conjoint test is encouraged to focus much more attention on price and price differences than may occur in a natural purchase environment. Thus, while conjoint analysis is still useful for studying non-price trade-offs, it should not be trusted in situations where there is little evidence that the purchaser evaluates prices when actually making a decision. For example, research companies have compared the predicted effects of price on physicians prescribing decisions with data on the actual price of the pharmaceuticals they prescribed. The conjoint tests predicted much higher price sensitivity than in fact was the case. Also, if respondents have little experience with the product as is usually the case with innovative product categories, the technique

poorly predicts the trade-offs that customers will make.

Numerical estimates of price sensitivity can either benefit or harm the effectiveness of a pricing strategy, depending on how management uses them. This is especially true when respondents have considerable experience with the use and purchase of a product. If managers better understand their buyers and use that knowledge to formulate judgments about buyers' price sensitivity, an attempt to measure price sensitivity can be very useful. It can give managers new, objective information that can either increase their confidence in their prior judgments or indicate that perhaps they need to study their buyers further. An understanding of price sensitivity also provides a reference by which to judge proposed price changes—how will sales respond as we increase or decrease prices? Combined with variable cost data, it is possible to judge whether proposed changes in price will have the desired effect on profits.

Integrating soft managerial judgments about buyers and purchase behavior with numerical estimates based on hard data is fundamental to successful pricing. Managerial judgments of price sensitivity are necessarily imprecise while empirical estimates are precise numbers that management can use for profit projections and planning. However, precision doesn't necessarily mean accuracy. Numerical estimates of price sensitivity may be far off the mark of true price sensitivity. Accuracy is a virtue in formulating pricing strategy; precision is only a convenience.

In Summary

No estimation technique can capture the full richness of the factors that enter a purchase decision. In fact, measurements of price sensitivity are precise, specifically because they exclude all the factors that are not conveniently measurable. Some estimation techniques enable the researcher to calculate a confidence interval around a precise

estimate, indicating a range within which we may have some degree of statistical certainty that the true estimate of price sensitivity lies. That range is frequently wider than the interval that a well-informed manager could specify with equal confidence simply from managerial judgment. Unfortunately, researchers often do not (or cannot) articulate such a range to indicate just how tenuous their estimates are. When they do, managers often ignore it. Consequently, managers deceive themselves into thinking that an estimate of price sensitivity based on hard data is accurate when in fact it is only a point estimate of something we can rarely predict with 100 percent accuracy. Fortunately, a manager does not have to make the choice between judgment and empirical estimation. Used effectively, they are complementary, with the information from each improving the information that the other provides.



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