WhitePaper

Pricing New-to-Market Technologies: An Evaluation of Applied Pricing Research Techniques

Jay L. Weiner, Ph.D.
Senior Vice President, Director of Marketing Sciences,
Ipsos Insight, Services Division

Barry Zacharias
Vice President, Marketing Sciences, Ipsos Novaction & Vantis

Ipsos Insight • Ipsos Novaction & Vantis

About this Issue

The pressure to gain market share and revenue with new-to-market technology services and products is unrelenting. With millions of dollars and hundreds of jobs potentially on the line, it is imperative that the product marketer is equipped with the best information available to determine the optimal pricing strategy for a new service or product. But with the variety of pricing research techniques to choose from, how does the product marketer know which is best? This paper reviews commonly used pricing research techniques and discusses when it is best to use each so that the product marketer can make better choices in determining pricing strategies.

Editorial Board

Research Team

Top Tuangsithtanon
Warren Vandale

Design and Production

Roland Clifford
Barbara Day
Erin Williams

About Ipsos Insight

Ipsos Insight, the flagship marketing research division of Ipsos in the U.S., has industry specialists serving companies in the following categories: consumer products; technology and communications; health and pharmaceuticals; financial services; cable, media and entertainment; agrifood; energy and utilities; and lottery and gaming.

Ipsos Insight provides custom and tracking research services to domestic clients, as well as U.S.-based multinationals. It offers concept and product testing, package testing, attitude and usage studies, omnibuses, tracking systems, brand equity, price optimization and segmentation, marketing models, advanced analytics, and global research. Ipsos Insight is an Ipsos company, a leading global survey-based market research group. To learn more, please visit **www.ipsosinsight.com.**

About Ipsos Novaction & Vantis

Ipsos Novaction & Vantis is a leading international forecasting, modeling, and consulting group for FMCG (fast moving consumer goods), durable goods, and service sectors. The company's survey-based research offerings are designed to help clients in four key areas: new product development (needs identification, concept screening, and forecasting sales); feature optimization and pricing; brand and market management; and sales and marketing effectiveness. Ipsos Novaction & Vantis is an Ipsos company, a leading global survey-based market research group. To learn more, visit **www.ipsosnv.com.**

Abstract

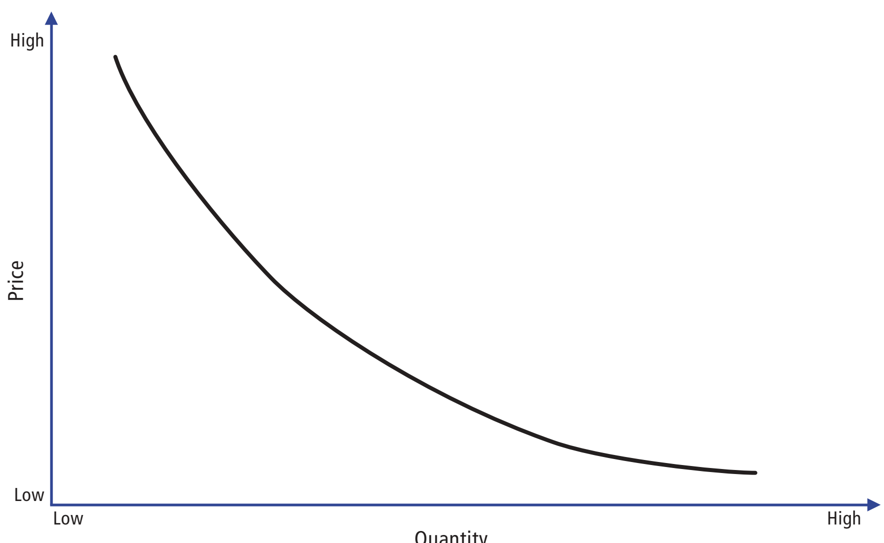
The lifeblood of many organizations is to introduce new services and products to the marketplace. One of the commonly asked questions in the area of new product development is “What price should we charge?” For new-to-market technology products, this is a particularly imposing challenge because there are limited precedents on pricing expectations among potential buyers. There are several techniques available to answer the question, and for a variety of reasons each yields unique results. This paper discusses four commonly applied methods of conducting pricing research for new-to-market technologies and when it is appropriate to use each technique. Experience proves that the answer is not necessarily in the data. Key factors in determining the most appropriate method are the product’s position in the development process, the competitive situation, and other market dynamics. The four methods discussed in this paper include: monadic concept testing, the Price Sensitivity Meter (PSM), conjoint modeling, and discrete choice modeling.

Choosing a Pricing Strategy

The basic economic course presents a competitive marketplace for goods and services in a classic supply and demand environment. A demand curve for normal products slopes downward, showing an inverse relationship between price charged and quantity demanded. As the price is raised, the quantity demanded drops, and total revenue falls.

Demand Curve

In the classical supply and demand environment, demand decreases as price increases



In fact, this relationship is oversimplified because most products exhibit a range of *inelasticity.* That is, there is a range where demand may fall, but total revenue increases. It is this range of inelasticity that is of interest in determining the optimal price to charge for the product. Consider the following question: If the price of an inkjet cartridge were raised by $1.00, would you print fewer photos? If the answer is no, then the product marketer might raise the price of cartridges such that the quantity demanded is relatively unchanged, but total revenue increases.

The range of inelasticity begins at the point where the maximum number of people is willing to try the product, and ends when total revenue begins to fall. Where the marketer chooses to price the product or service depends upon the pricing strategy.

There are two basic pricing strategies:

Price skimming, which sets the initial price high to maximize revenue. As the product moves through the product life cycle, the price typically drops. This strategy is often used for technology-based or patent-protected products. Technology companies, for example, often introduce new products at high prices, and as competitors match performance characteristics, they lower prices. This approach may also be used when capacity constraints limit the volume potential that can be obtained at the beginning of a product's life cycle, such as the early launch of flat panel TVs.

Penetration pricing, which sets the initial price low to maximize penetration, or early sales. This pricing strategy tends to discourage competition, as economies of scale are often needed to make a profit and the first to market is at a distinct advantage. Penetration pricing may also apply when the profit model is driven from sales that support a product with a large installed base. Such examples include printers and ink cartridges, cell phones and service plans, and game consoles and software.

Beyond skimming and penetration, pricing strategies can get more complex. Product and service combinations involving multiple vendors are common to the technology industry; digital video recorders, for example, require a stand-alone or embedded device as well as a subscription, and are available through a variety of channels. The pricing research techniques studied in this paper can apply to such scenarios.

Ultimately, the goal of the product marketer is to understand the whole range of prices so as to make good strategic pricing decisions.

Approaches to Pricing Research

There are five commonly used research techniques for obtaining data used to determine prices for new products:

1. The direct approach, where you simply ask a representative sample of your target market "How much would you be willing to pay for this product or service?" It is widely recognized that this technique is not reliable, and it will not be discussed further in this paper.[1]
2. The monadic concept test, where you ask, "How likely would you be to buy this product or service at $250?" You would likely do this at three price points with matched but different groups of respondents.
3. The Price Sensitivity Meter (PSM), where you ask a series of questions that target the upper and lower price boundaries. For example, "At what price would you consider the product too expensive and you would not consider buying it?" Purchase intent questions follow price perception questions at respondent-stated price points.
4. Conjoint analysis and choice-based conjoint, where you ask the representative sample to choose among a set of versions of the product or service, or to indicate purchase intent of individual versions.
5. Discrete choice, where you ask the sample to choose between numerous product scenarios varied by feature set, price, and brand.

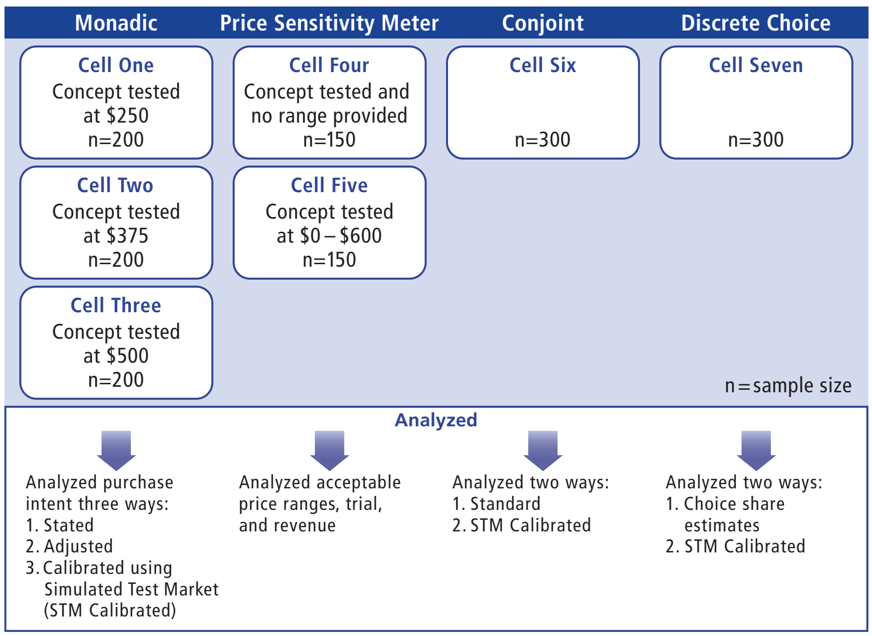
[1] There are other commonly used techniques for arriving at price, such as using Delphi groups or taking direction from sales reps; because they are not driven by research data, they are not discussed in this paper.

To provide an example for comparing the techniques, we conducted parallel monadic, PSM, conjoint, and discrete choice studies using a DVD recorder concept (see Appendix). The research design (figure 1) involved a total of seven test cells: three monadic cells, one each testing the DVD recorder at $250, $375, and $500; two PSM cells, one with no mention of competition and market prices, the other with examples of competitive DVD recorders and prices; a conjoint cell, and a discrete choice cell. Each cell included a unique but matching set of respondents, all screened for the same basic affinity for technology by their current household ownership of certain technologies or near-term purchase intent of such products.[2]

Figure 1

Research Design

Seven test cells



Monadic Concept Testing: Simple, Effective, and Expensive

Monadic concept testing gained popularity with consumer packaged goods manufacturers early in the marketing research movement. However, monadic tests results are traditionally flat; that is, there is little drop in purchase intent over the price range tested. This is likely due to the narrow range of prices tested, as the price ranges in typical packaged goods concept tests range by only 10% to 20%. While this seems large, it is often less than 80 cents (for example, a box of macaroni and cheese at $.79, $.89, or $.99). In technology products, 20% can represent hundreds, even thousands of dollars (for example, a plasma TV at $2,999, $5,999, or $7,999). Still, this technique can provide value if it used at the right time in the development process and the data is analyzed properly.

Using our DVD recorder example, we analyzed the monadic purchase intent data three ways: stated, adjusted, and calibrated with a simulated test market.

[2]U.S. only. Data collected Spring 2004.

Table 1: Purchase Intent Results of Monadic Approach[3]

Price	Self Stated Purchase Intent	Widely Used Adjusted Purchase Intent	STM Calibrated Purchase Probability
$250.00	35.40%	16.80%	9.08%
$375.00	22.10%	12.70%	6.46%
$500.00	17.40%	11.50%	5.18%

Self-Stated Purchase Intent

Stated purchase intent is often used to determine the general appeal of the concept, but not price alone. It's a good starting point but it is well documented in literature and common practice that this is not sufficient to set reliable pricing strategies.

In the DVD recorder test, there is a significant drop between price points: 35.4% of the representative sample claims they "definitely" or "probably" would purchase the product at $250, while only 17.4% say the same at $500 (See Table 1). With this wide range, it is difficult for the product marketer to zero in on a good price.

Widely Adjusted Purchase Intent

A common practice to compensate for this is to probabilistically weight purchase intent to better represent the potential buying population. Many researchers use a 0.8 weight for "definitely would buy," 0.3 for "probably would buy," and 0.1 for "might or might not buy." Although these weights may work in many categories – say, consumer packaged goods where the price is not very high and the risk when purchasing is not very great – our experience shows that as this price range increases, other weights and calibrations yield more reliable results. In the DVD Recorder example, the purchase intent appears more realistic, and may be acceptable for basic price checking, but would need further adjustment for more precise needs like demand estimation.

Simulated Test Market and Purchase Probability

Finally, we modeled the monadic purchase intent data using a research-based simulated test market (STM). This technique uses a large survey results base from consumer new product evaluations to help predict demand. The model for estimating potential demand incorporates stated interest, value perceptions, product pricing, data collection methodology, competitive environment, country of origin, and other factors.[4] By adjusting the monadic survey data with actual in-market results for similar products and services, the product marketer can move beyond weighted purchase intent and obtain an estimate of purchase probability, or demand, which can then be used to estimate price elasticity and profitability. The results show lower figures, but are realistic to in-market expectations.

When to Use Monadic Concept Testing

With the numerous options available for analyzing monadic data, it is no wonder that monadic testing is a commonly used technique. In the technology environment, monadic testing is most useful at two distinct points in the development process:

1. During the middle stage of development, when the product is well-defined and the product marketer wants to know how the product will perform at one or two specific prices. If the product performs well at the prices tested, it is usually considered a green light to continue with the product; if it performs poorly, it is a sign to go back and re-tool.

[3] Purchase intent is measured on a 5-point scale, with Top 2 Box equaling the sum of responses of the two highest points, in this case "definitely" and "probably" would purchase.

[4] The model relies on the Ipsos Vantis database of nearly 6,000 concepts in the area of durables, consumer electronics, technology, telecommunications, financial services, health, and alcohol. Over 100 validations have resulted in accuracy levels of ±20% in over 90% of validations conducted.

2. Later in the development cycle, when the product is closer to launch and the product marketer wants to measure potential performance against past tested concepts for a more precise understanding of demand potential.

For practical purposes, monadic tests are simple and easy to execute. However, testing a range of price points requires a large sample, which drives up costs and often extends the time needed to collect data. Other, more flexible techniques require smaller sample sizes.

Finally, although consumers may plan to buy a particular product eventually, their responses are often overstated in the survey environment.

Price Sensitivity Meter: Accuracy Meets Economy

In order to better understand the price consumers are willing to pay for a particular product or service, Dutch economist Peter van Westendorp developed the Price Sensitivity Meter (PSM). The underlying premise of this model is that there is a relationship between price and quality based on the theory that you get what you pay for. That is, if you buy a better quality product, it will have a longer life and be cheaper to own over its useful life, and that a proportion of consumers is willing to pay more for such a product. The PSM is based on data from four questions:

- At what price would you consider the product to be getting expensive, but you would still consider buying it?
- At what price would you consider the product too expensive, and you would not consider buying it?
- At what price would you consider the product to be getting inexpensive, and you would consider it to be a bargain?
- At what price would you consider the product to be so inexpensive that you would doubt its quality, and would not consider buying it?

Figure 2

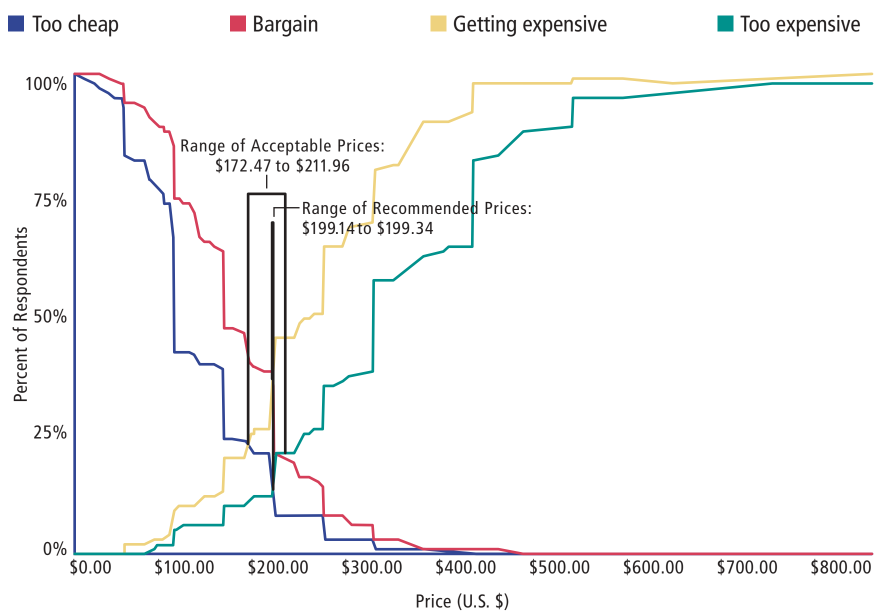
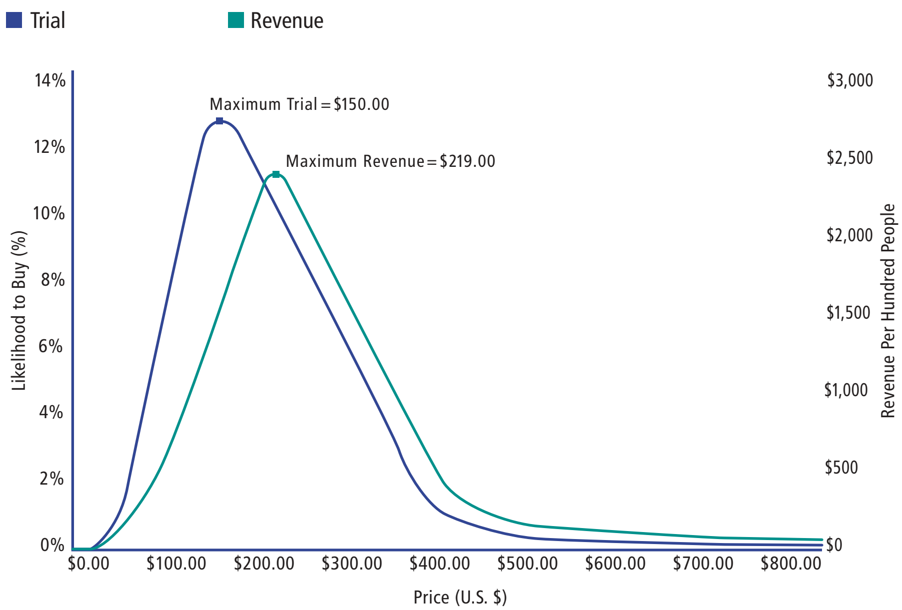


Figure 2 shows the acceptable range of prices and the recommended pricing range that results from the four PSM questions (data represents the PSM Cell with price range provided). The lower boundary for an acceptable price for the DVD recorder test concept is $172.47, and the upper boundary is $211.96. The recommended pricing range is bound on the lower end by $199.14 and on the upper end by $199.34. Pricing the product less than $199.14 forfeits profits. Pricing the product in excess of the $199.34 causes the sales volume to decline.

To frame the range of inelasticity and plot trial and revenue curves, we add two purchase probability questions after the PSM "bargain" and "getting expensive" price point questions. (We do not ask the questions at the "too cheap" and "too expensive" price point questions because we assume that the probability of purchase at these two points is nil.) The resulting curves indicate the price that will stimulate maximum consumer trial and the price that maximizes revenue.

The trial and revenue curves offer additional insight into the pricing question. By plotting the probability of purchase at each price point, we can identify the price that will stimulate maximum trial. By multiplying the proportion of people who would purchase the product at each price by the price of the product, we generate the revenue curve.

Figure 3



The difference between the point of maximum trial ($150) and the point of maximum revenue ($219) represents the relative inelasticity of the DVD recorder concept. Again, this is where there is a small decrease in sales if the price were increased within this zone. If we choose to price the product at the point of maximum revenue, we may lose a few customers, but depending on production, marketing, and distribution costs, the incremental revenue may more than offset the decline in sales.

There were no notable differences in the results for the PSM cell in which respondents were not provided with competitive DVD recorders and prices.

When to Use the Price Sensitivity Meter (PSM)

The PSM technique is most relevant when the product marketer needs the flexibility of evaluating how the product will perform along a range of prices. If the acceptable range of prices, according to the marketplace, fits with the expectation of the product marketer, it is interpreted as a sign to move forward with product development. This technique also allows the product marketer to experiment with trial and revenue along a range of prices, whereas the monadic approach restricts the product marketer to the two or three a priori prices tested.

Another key advantage of the PSM approach is cost. Although the analysis is more involved, fewer respondents are needed than with the monadic test: in our DVD recorder study, we had 150 respondents in one PSM cell, and we were able to predict trial across a wider range than that tested by the 600 respondents in the monadic cells. The low incremental cost of the PSM analysis is far more attractive than the high incremental cost of additional sample required for the monadic approach.

With the PSM and purchase probability extension, the product marketer also obtains trial and revenue information. An accompanying simulator to test what-if scenarios allows the marketer the flexibility to test each price within the range.

A possible disadvantage is that, given the price range tested, this method may have over-predicted the loss in sales at higher price points. While the PSM approach has the nice property of forcing the consumer to think about rational price ranges, it may artificially make them overly price sensitive by forcing internally rational responses. That is, consumers might think $500 is too much, when in reality they might defer payment by using a credit card.

Further, this technique works well when testing products consumers have experience with, but modifications to the technique may be useful when the product is a new-to-the-world idea and consumers do not have a precedent for determining what price would be reasonable.

Conjoint Analysis: Complexity for Accuracy

Conjoint analysis, a form of choice modeling, involves a more complex measurement instrument than monadic concept testing or the PSM. But the results allow the product marketer even greater flexibility in determining the optimal price. In a conjoint analysis survey, the respondent is exposed to a series of pairs of product profiles based on an experimental design; in a choice-based conjoint, the respondent is exposed to a series of scenarios with two or more full product profiles. The design is constructed such that a model can be developed that allows for the estimation of all possible combinations of attribute levels. Conjoint is typically used in product optimization. For example, we can determine how much more attractive a DVD recorder is to people if we include a universal remote. At the same time, we learn how the universal remote affects the price of the product. By doing this with the product attributes, the product marketer can evaluate the numerous combinations of features and price and determine which is the optimal go-to-market scenario.

In the DVD recorder example, we analyzed the data using a standard conjoint analysis approach, as well as a calibrated approach, which employed the market simulator modeling approach on the monadic data. To compare the results across techniques, we elected to show the output – choice share – at three price points ($250, $375, $500) used in the monadic test; in reality we can evaluate a variety of price points in the conjoint and discrete choice approaches.

Table 2: Purchase Intent Results of Conjoint Approach

	$250	$375	$500
Standard	20.90%	15.20%	9.50%
Calibrated	8.88%	6.93%	4.98%

Calibrated Adjustment to Conjoint Analysis Test Results

We commonly use the monadic approach mentioned above to forecast sales for specific scenarios. However there are usually too many scenarios to test monadically and therefore a trade-off exercise is necessary to assure that sample sizes do not get out of hand. As mentioned earlier, sales volume can be overstated in survey data. We compensate by using a regression technique to fit a curve between the conjoint estimation and the forecasting model prediction for the same scenarios, and then use that curve to project results from the conjoint that were not tested monadically.

When to Use the Conjoint Approach

The conjoint is most useful when the product marketer needs to isolate the value of each feature tested to learn the premium, if any, that the target market is willing to pay. Here too, the product marketer is able to run what-if scenarios with all combinations of features and prices to see the trial and revenue potential. This technique is therefore used further along the development path, typically when the developing company needs to finalize the product configuration for manufacturing and investment purposes.

Compared to the monadic and PSM approaches, the conjoint offers two key advantages: precision and economy. Conjoint typically requires the same base size as a single cell in a monadic concept test, so it is less expensive than a monadic test. It also permits the prediction of all possible combinations of attributes. In this study, we had four brands, three price points, two levels of parental control, and two levels of type of remote, resulting in 48 possible combinations. This would have required 48 monadic cells – a cost and time prohibitive undertaking.

While the conjoint approach focuses on the attributes and features of the test concept, discrete choice adds another factor: competition.

Discrete Choice Analysis: Brands, Features, and What They Are Worth

Discrete choice, like conjoint, requires an experimental design and permits the estimation of all possible combinations of attributes. The key difference between conjoint and discrete choice is that the latter presents respondents with a competitive shelf from which to choose. It also allows the respondent to say that they would not purchase any of the products shown. The competitive set comes close to mimicking the types of decisions that respondents actually make in the market. Typically, the results are presented in an Excel-based simulator that permits the user to simulate not only changes to the primary brand, but also to simulate possible competitive response.

We analyzed the discrete choice data set in four ways. In the first two analyses, we ran simulations at each of the three price points we have discussed in this paper – once with the product in a competitive set, and once as though it were the only product on the shelf. We ran the same two competitive scenarios a second time, calibrated to the data-base-based market simulation model used to analyze the conjoint and monadic results.

The calibrated results are remarkably consistent for both scenarios, attesting to the value of the database-backed model.

Table 3: Choice Share Results for Discrete Choice Approach

	Survey Data Only		Data Calibrated to STM	
%	With Competition	Without Competition	With Competition	Without Competition
$250	30.44%	40.73%	9.17%	8.85%
$375	10.96%	28.04%	6.15%	6.99%
$500	6.64%	14.28%	5.48%	4.97%

When to Use the Discrete Choice Approach

Similar to the conjoint approach, the discrete choice approach is best used when the product marketer needs to isolate the value of each feature tested to learn the premium, if any, that the target market is willing to pay. The added benefit of the discrete choice approach is that it also shows the premium, if any, that one brand tested can charge over the other brands tested. Here too, the product marketer is able to run what-if scenarios with all combinations of features, prices, and brands to evaluate trial and revenue potential.

Discrete choice is often employed to test product line extensions and potential cannibalization because the approach allows the respondent to choose from a variety of products or services that may be available. Flexibility in testing a variety of pricing scenarios makes discrete choice an ideal candidate to test a variety of pricing strategies.

This modeling technique is appropriate further along the development path, when the developing company is solidifying the product configuration for manufacturing, investment, and marketing purposes.

Much like the PSM and conjoint models, most discrete choice studies require smaller samples than multi-cell monadic concept tests, making the discrete choice a more economical choice.

Summary

Monadic Concept Testing

Monadic concept tests tend to over-estimate trial and do not seem to have a reasonable estimate of elasticity. This may be because prices given to respondents in a monadic concept test do not adequately reflect sales promotion activities or competitive products and prices. Also, consumers tend to overstate more at higher price points, so while purchase intent may be similar, different adjustment factors should be applied to different prices to determine price elasticity.

When data is modeled using the proper adjustment factors, the purchase intent levels are dialed down and other factors such as value are incorporated to create more realistic levels of demand at alternative price points.

Further, monadic concept tests require a higher base size. A typical concept test would require 200 to 300 respondents per cell, although per cell sample size may be smaller if the overall sample size is large enough. The number of test cells required would depend on the prices tested, but from the results, it appears that three cells tend to over-estimate the range of inelasticity. Providing a competitive price frame might improve the results of monadic concept tests. This pricing technique is recommended once the concept is fairly well developed and some prior research has been conducted to narrow the possible price range.

Price Sensitivity Meter (PSM)

The PSM does a reasonable job at the lowest price point, but seems to be too severe across the relevant range of prices, of predicting trial from a concept test without the need for multiple cells.

The PSM approach reduces the cost of pricing research, but also the likelihood of not testing a low enough price. The prices given by respondents are believed to represent the actual out-of-pocket expenses. This permits the product marketer some understanding of the effects of promotional activities (on shelf price discounts or coupons). The PSM approach will also permit the marketer to understand the potential trial at price points higher than those that might be tested in a monadic test. In this study, the PSM predicts a significant drop in sales as the price is raised. The loss in sales as the price is raised may be over-predicted with this model. PSM is used throughout the concept development process, but is particularly useful at the early stages of development.

Conjoint and Discrete Choice Modeling

Conjoint analysis tends to over-estimate trial, as does the discrete choice with only one product on the shelf, but the competitive shelf discrete choice model does a more realistic job of predicting sales. In the non-calibrated competitive shelf scenario, the impact of the price of competition plays a major role in the sharp decline in sales as the price is raised.

The simulated test market approach paired with either discrete choice or conjoint provides the most appealing solution for a concept that is further along in the development process. The model used to derive demand appears to incorporate enough price sensitivity so that revenue curves seem reasonable compared to what one would expect for price sensitivity for a premium brand. Furthermore, the incorporation of conjoint or discrete choice calibrations can help provide better value for research dollars. This technique can also be used to model the outcome of pricing and marketing strategies; the product marketer can determine the outcome of all pricing-related decisions through the simulator. For example, across the range of $250 to $500, different consumer awareness and channel strategies might apply, thus resulting in even lower sales at high price points than would be expected by just considering consumer pricing thresholds.

Which to Choose?

With a variety of pricing research choices and potential outcomes, how does the researcher choose the best approach?

It depends on where the product is in the development process. For early stage products or lower risk situations, often the marketing team simply needs to know if the target market values the product at a reasonable price – say, $149 for a cell phone – in order to move forward. Monadic testing will suffice.

If the marketing team needs a more accurate read on trial and revenue potential, and consumers are familiar with the product category and price levels, the Price Sensitivity Meter is the most economic approach.

If the determining price for a number of possible feature sets is the objective, then a conjoint or discrete choice is most appropriate. Discrete choice is also useful for determining how to price a line of products in order to minimize cannibalization. It also depends on the degree of risk.

The Simulated Test Market results are consistent across all methods tested; if a company is ready to invest millions of dollars in developing and launching a product, then the more precise measurement tools involving simulated test markets are recommended.

Summary of Pricing Research Techniques

Approach	This approach is most suitable when the marketer wants to...	Typical Outcome	Next Steps
Monadic	• Test specific price points • Compare to results of prior concepts tested	• Purchase intent scores	• Move forward with further R&D or re-tool, depending on test results
	If using STM model:		
	• Obtain a volumetric forecast		
Price Sensitivity Meter	• Understand the target market's perception of the acceptable range of prices	• Acceptable range of prices • Trial and revenue estimations	• Move forward with further R&D or re-tool, depending on test results
Conjoint	• Identify the optimal price for all possible configurations	• Price for each possible configuration • Simulator to test what-if scenarios	• Finalize product configuration • Fine tune marketing plan • Adjust revenue expectations
	If using STM model:	If using STM model:	
	• Understand the impact of price on sales • Obtain a volumetric forecast	• Identify sales and revenue potential for each possible configuration	
Discrete Choice	• Identify the optimal price for all possible configurations • Determine the premium the market or segments of the market are willing to pay for specific features or brands	• Price for each possible configuration • Premium, if any, for each feature and brand • Simulator to test what-if scenarios	• Finalize product configuration • Fine tune marketing plan • Adjust revenue expectations
	If using STM model:	If using STM model:	
	• Understand the impact of price on sales • Obtain a volumetric forecast	• Identify sales and revenue potential for each possible configuration	

Appendix

DVD Recorder Concept Description

The following concept provides information about DVD recorders. These DVD recorders are hooked up specifically to a TV set, and resemble and function very much like a VCR, but with better audio and visual quality. All DVD recorders can record from any analog video source. They can record video in resolutions ranging from DVD quality to VHS quality depending on the recording speed used. You can use this product to watch and record DVDs at home.

[Picture of branded DVD recorder shown.] It is of average thickness (3.4 to 3.6 inches) and can:

- Digitally record, edit, store, and play back a wealth of audio and video formats, including DVD+R, DVD-R, DVD+RW, DVD-RW, MP3 CDs, JPEG image CDs, audio CDs, video CDs (VCDs), and S-VHS tape (at VHS resolution).
- Offer component video output that enables DVDs to create sharper images than VCRs, by using the best method for transferring a video signal from a DVD recorder to a TV. The jacks themselves are colored red, green, and blue and carry the brightness (the black-and-white portion of the signal) and the blue and red color signals separately.
- Provide progressive scan, which is found on DVD recorders, computer monitors, and digital TVs, which creates a picture as a single image, scanning all the lines in succession (1, 2, 3, etc.). As a result, pictures created using the progressive scan technique look sharp and crisp.
- Produce audio quality, which is similar to playing audio CDs, but is dependent upon the type of speakers and surround sound system.
- Offer parental control.
- Include a universal remote control.
- Offer a standard 12-month warranty on labor and parts.

References

Lyon, David W. (2000). Pricing Research. In Chuck Chakrapani (Ed.), *Marketing Research: State-of-the-Art Perspectives* (pp. 551–582). Chicago, IL: American Marketing Association.

Newton, Dennis (1997). Simulated Test Market Validation: A Nextel Communication Example, PDMA/Sarnoff Research Center presentation *"Linking Emerging Technologies to New Markets"*

Newton, Dennis, Miller, Jeff, & Smith, Paul (1993). A Market Acceptance Extension to Traditions Price Sensitivity Measurement. Place: AMA ART Forum.

van Westendorp, Peter H. (1976). NSS – Price Sensitivity Meter (PSM) – A New Approach to Study Consumer Perception of Price in Venice Congress Main Sessions (pp. 139–167). Amsterdam: European Marketing Research Society (ESOMAR)

Weiner, Jay L. & Markowitz, Lee (2000). Calibrating/Validating an adaptation of the van Westendorp model. Monterey, CA: AMA ART Forum Poster Session.

Zacharias, Barry (2002). A Validated Approach to Accurate and Reliable Sales Forecast. Vail, CO: AMA ART Forum Poster Session.

About the Contributors

Jay Weiner, Ph.D., Senior Vice President, Marketing Sciences, Ipsos Insight

Jay consults with many leading corporations on marketing and market research issues. He specializes in applying advanced methods to help companies make better marketing and business decisions both domestically and globally. Jay has expertise in pricing, segmentation, customer and employee loyalty, conjoint analysis, and discrete choice analysis, in addition to solid multivariate statistical skills.

Jay has his doctorate in marketing research from the University of Texas at Arlington, as well as an MBA in finance and commercial banking and a BBA in marketing. Jay has published and presented numerous papers on conjoint, choice, and pricing research in conference proceedings.

Barry Zacharias, Ph.D., Vice President, Marketing Sciences, Ipsos Vantis

Barry is responsible for the models and statistical quality standards of the research designs and analyses at Ipsos Vantis. His experience includes work in the telecommunications, financial services, utilities, software, large and small durables, and high-technology industries.

Barry has considerable experience in a wide variety of research techniques. In particular, he has made significant contributions to the calibration of choice models within the Ipsos Vantis forecasting methods, development of many aspects of the forecasting models, and management of the Ipsos Vantis Key Measures and Validation Databases.

Before joining Ipsos Vantis, Barry worked in the area of business research with Eastman Kodak for six years. He was responsible for data analysis and project management for both consumer and business-to-business research applications. Prior to working in business research, Barry served as a statistician, responsible for implementing statistical process control and experimental design in a manufacturing setting. Barry earned a master of science degree in statistics from the University of Rochester and a bachelor of science in mathematics from Rochester Institute of Technology.

North America

Europe

Latin America

Asia-Pacific

Middle East

w w w . i p s o s - n a . c o m

1 . 8 8 8 . 2 1 0 . 7 4 2 5