

DOES YOUR PRICING STUDY MAKE THIS COMMON MISTAKE?

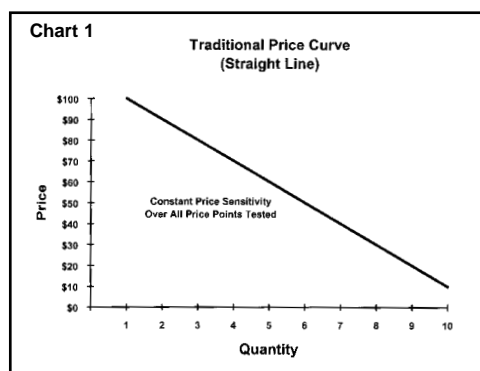
Advanced technology products follow Z-shaped price curves

By: **Albert Fitzgerald**

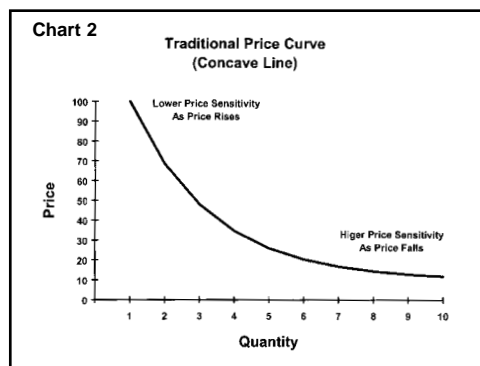
Editor's note: Albert Fitzgerald is president of Answers Research, Inc., Solana Beach, Calif. © Answers Research



Traditional price studies attempt to create a price curve so that, within a range of prices, we can determine the quantity sold (i.e., relative demand). Traditional economics texts have typically drawn price curves as either straight lines or as smooth, concave curves. I remember my first college economics class using Samuelson's economics book (the "bible" of freshman economics). All of the price curves had a wonderfully smooth shape. Many were drawn as straight lines showing the simple relationship that as price increases, the quantity that would be sold (i.e., demand) falls. (see chart 1)



But more typically, the price curves were drawn with a concave shape (chart 2) demonstrating that as price gets very low, demand gets disproportionately greater. Likewise, even at very high prices, some people (presumably those who are not price sensitive) will continue to purchase in similar quantities.



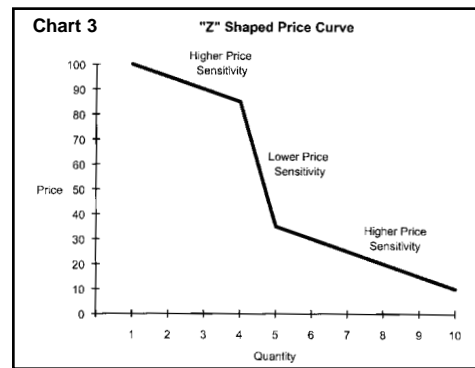
(Price Sensitivity) at Differing Price Points

A straight line or "flat" price curve indicates that for all prices tested, price sensitivity is constant. This means that as price increases, demand drops at a constant rate. In economics texts, price sensitivity is generally referred to as the "demand elasticity." A concave price curve shows that price sensitivity is less at higher price points and greater at lower price points. This can be seen in chart 2. As price drops from \$100 to \$70, the quantity demanded increases from one to two units, showing that for a relatively large price drop, few additional people buy. However, when price drops from \$20 to \$10, the number of units sold increases dramatically from six to 10 units, demonstrating that, in this price range, the market is highly sensitive to price. The logic behind this type of price curve is that at high prices, most of the price sensitive people have already stopped buying and that the few people left are not very price sensitive and are willing to pay a high price.

"Z"-Shaped Price Curves

For many business-to-business and advanced technology product purchases, the traditional flat or concave price

curves do not seem to fit empirical evidence. We have found in many quantitative studies that demand actually follows a Z-shaped price curve.



In chart 3 we show a hypothetical Z-shaped price curve. It shows three distinct sections. At lower prices (i.e., below \$30) it shows a high sensitivity to price, similar to what we would expect to see in a flat or concave price curve. At middle price points (i.e., between \$30 and \$80) we see a very low sensitivity to price changes. This differs from traditional price curves (i.e., flat or concave price curves) which would indicate that price sensitivity should be medium. At higher price points (i.e., above \$80) we see the exact opposite of what traditional economic theory would indicate. Instead of low price sensitivity, we see instead an area of very high price sensitivity.

We have both empirically derived this phenomenon in numerous quantitative studies as well as validated these results in qualitative studies. These findings indicate that there are, indeed, three distinct sections to the price curve -- high price sensitivity exists at both very low and very high prices while low price sensitivity exists over a range of prices we call "going prices."

Unique Purchase Process Explains "Z"-Shaped Price Curves

To understand why sensitivity to price varies over certain ranges of prices, it is first necessary to understand the purchase process for advanced technology and many business-to-business products. We can use as an example the purchase of a laptop computer. Business purchases, and especially advanced technology purchases, tend to be high risk purchases to buyers. Mistakes can have a high cost in terms of dollars and to one's career. In addition, the "true" cost of many high technology products can be much higher when intangibles such as training costs, potential down time, and installation costs are included. When all of these factors are taken into account, many advanced technology products and other business purchases follow a similar purchase process. In this purchase process, the typical buyer moves through four stages.

Stage 1 is the Awareness Stage. During this stage it is quite typical for a buyer to conduct a literature search (i.e., look at a review of notebook PCs in a computer magazine on the web), or ask a reseller or colleague for recommendations. The main purpose of this stage is to become educated about the alternatives and features available.

Stage 2 is the Consideration Stage. The purpose of this stage is to reduce the number of products evaluated. There are literally hundreds of possible notebook PCs available on the market. During this stage the buyer selects a small subset for evaluation. This process of reducing the alternatives is often brutal and quick. By now the buyer has decided on the key features required and typically has a solid idea of what the cost should be. We call this range of prices the "should-pay" prices. At this stage, price is often a key determinant in what products make the cut and the should-pay price range becomes extremely important. Products that exceed the should-pay ceiling often are automatically excluded. And

several products which are below the should-pay floor are often evaluated even though they would normally not be evaluated. For example, when reviewing available notebook PCs, the buyer may decide that for a given set of features he should pay between \$1,700 and \$2,500. Any product that exceeds the \$2,000 ceiling never makes it to the next stage. However, products that are less than the \$1,700 floor are quite often taken into the next stage even though they would not typically have been evaluated at expected prices (perhaps because they are from an unknown manufacturer). In other words, the product is evaluated because it is such a great deal.

In Stage 3 Products Are Evaluated. Only the few products that made the short list are seriously evaluated. But once a product makes it to this stage, price becomes much less important and features/benefits are key in the final purchase decision. I have seen this validated not only empirically through pricing studies, but also through myriad focus groups and one-on-one interviews. The bottom line is that price becomes disproportionately important in the consideration stage and is used primarily to eliminate products from consideration. Since only those products that are either within the should-pay range or have an unexpectedly low price are seriously evaluated, price takes on a unique role. Individual price points are subordinate to the should-pay prices, meaning that as long as the price is within an appropriate range, it does not matter if it is on the high or low end--resulting in low price sensitivity. In Stage 4 the actual purchase is made.

Reasons for the Kink in the Price Curve

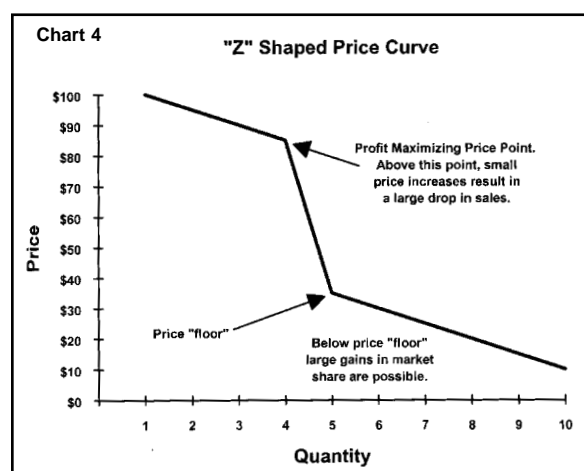
One could argue that there really should not be kinks in the demand curve because each individual determines their own unique should-pay price range. However, in many advanced technology product categories, we have found that the should-pay price range varies little between individuals. One of the main reasons is due to the dynamics of advanced technology markets. Advanced technology markets are often highly influenced by gurus -- a few, highly knowledgeable, highly respected people who influence entire markets.

We find that for most advanced technology product categories, there are several magazine editors who fit this description of a guru. Price ceilings and floors are often talked about in magazine reviews with many publications excluding products that exceed ceiling prices. Even when they include higher priced products, these products rarely win Editor's Choice awards, and magazines are clear in saying if they feel the price is too high. Likewise, floor prices are defined. Anyone familiar with the computer industry will certainly see plenty of magazine covers with headlines like "Pentium IV PCs break the \$1,000 price barrier."

The reason gurus become very influential is because it is difficult to stay abreast of rapidly changing technology. Business buyers rely on experts to guide their purchases. These experts set price expectations for entire markets. This is rarely true for consumer or commodity products. We would rarely see a Z-shaped demand curve if the product has become well understood and commodity-like. For example, desktop PCs have become so well understood that gurus are much less influential in establishing should-pay prices. Therefore, price curves will often follow traditional economic theory, with the market's "invisible hand" creating more traditional price curves.

Interpreting "Z"-Shaped Price Curves

Several important implications can be drawn from Z-shaped price curves.



1. The profit maximizing price point would typically be at the high end of the should-pay range. But caution must be exercised because pricing above the should-pay ceiling would result in a dramatic drop in sales.
2. Pricing below the "floor" has the effect of potentially

gaining significant market share. Loss leaders, sales, and introductory prices are all pragmatic examples of how many companies have -- if not theoretically, at least from experience -- recognized that going below the floor price has the effect of gaining significantly increased consideration, evaluation, and purchase.

Dangers of Smoothing Price Curves

Over the years, I have read numerous articles on market research pricing studies which automatically assume that resulting data will be "fit to a curve." However, very few articles ever discuss the caveats and pitfalls of smoothing pricing data. Perhaps it is the desire to eliminate "outliers" -- data that would look weird if a client actually saw the raw data -- or more likely it is due to pragmatic considerations of current software packages commonly used in the research community. Many packages require that results from pricing research be treated as continuous ratio data (as opposed to nominal data) in order to extrapolate demand at prices other than those explicitly measured. For example, SPSS's conjoint simulation module requires that utility scores for price be treated as continuous data (i.e., forcing all points to sit on a line) rather than discrete (data which is not forced to fit a line) in order to simulate prices between those actually measured. SPSS gives basically two options for continuous pricing data: linear, which forces all points to fit a straight line; or ideal/anti-ideal, which are quadratic models which can be used to generate a concave price curve.

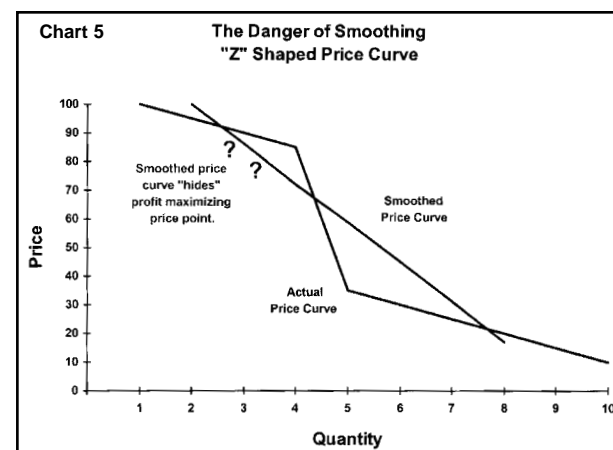


Chart 5 illustrates what might happen if a researcher were to smooth a Z-shaped price curve.

We can see that the inflection points would disappear. And it would be unlikely that an optimal price point would be chosen.

Here are some implications for pricing research:

1. The range of prices tested is very important. We recommend including prices which are higher and lower than the should-pay prices. Of course this leads to another important implication.
2. It is critical to understand both the purchase process for the product under study and the range of should-pay prices. Our staff typically accomplishes this using one-on-one interviews, focus groups or focused interviews (essentially telephone focus groups).
3. The number of price points tested is important. If too few price points are tested, it is unlikely that the inflection points (where the kinks appear) can be accurately predicted. We recommend testing a minimum of five price points. And those prices must also be carefully chosen. Therefore, test as many price points as is practical in order to accurately predict where the kinks are in the price curve.
4. Be cautious in smoothing price curves. A smoothed price curve could result in a serious miscalculation of the profit maximizing price point.
5. Price points do not have to be equidistant, as would likely be required if a smoothing algorithm were being used.

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