Abstract

Price Sensitivity Meter (PSM), developed by Peter H. van Westendorp provides algorithms to determine various pricing points for a given product. Van Westendorp's PSM algorithms have been implemented in SAS. SAS GRAPH is used to display the results. PROC GPLOT with cubic splines is used to smooth and display the various price curves. ANNOTATE is used to label the price curves, and to highlight various theoretical pricing points.

PSM Description

The implementation of PSM involves collecting respondents perceptions of product/service prices. Each respondent must provide a response to each of the following four questions:

A. Print the letter "A" next to the price where it is so expensive that you wouldn't even consider it.

B. Print the letter "B" next the price where it is so cheap that you feel the quality couldn't be very good.

C. Print the letter "C" next to the price where it is starting to become expensive...it's not out of the question but you'd really have to give it some thought.

D. Print the letter "D" next to the price where it is really a bargain.

Responses to these questions should be indicated, one at a time, on a thermometer-like scale ranging from appropriate minimum and maximum price levels. For example, a scale going from $0 at the bottom to $5 at the top with four $1 line increments could be employed.

Analysis and SAS Implementation

A data set should be constructed consisting of responses to the four price questions (A-D) and any additional relevant variables. Use PROC FREQ to examine the data set. An output data set generated on the valid responses is needed to obtain cumulative frequency distributions. The resulting cumulative distribution to price question A is referred to as "too high". The cumulative distribution of valid responses to price question B must be subtracted from 100 at each unique response value. This results in an inverse cumulative distribution referred to as "too low". The same procedure is employed to price question C, resulting in an inverse cumulative distribution called "not high". The resulting cumulative distribution to price question D is referred to as "not low".

The computer code used to generate these cumulative and inverse cumulative frequency distributions and their resulting curves is presented at the conclusion of the paper.

Proc GPLOT is used to depict the four distributions as curves where price serves as the abscissa and percentage of respondents as the ordinate. The PLOT statement controls the overlay of curves and the attributes of axes. The SYMBOL statements control the curve color selection, and utilize cubic splines to smooth the curves. The degree of smoothing must be determined by visual inspection in an iterative fashion.

The intersection of these smoothed curves yields the pricing points of interest. Specifically, the optimal pricing point (OPP) is the intersection of the "too low" and "too high" curves. It is the point at which an equal percentage of respondents perceive the price as either too low or too high. This point represents the price at which...
resistance against price is low. The intersection of the "not high" and "not low" curves yields the point of indifference (POI). This is the point at which an equal percentage of respondents perceive the price as either low or high. This price generally represents the median price actually paid.

The last two price points form a band called the "range of acceptable prices". The lower end of this range is called the point of marginal inexpensiveness (PMI). This point occurs at the intersection of the "too low" and "not low" curves. This can be thought of as a theoretical minimum price. At the other end of the range is the point of marginal expensiveness (PME). This is the point at which an equal percentage of respondents perceive the price as "too high" and "high". It occurs at the intersection of the "too high" and "not high" curves, and indicates a theoretical maximum price.

ANNOTATE should be used within Proc GPLOT to highlight the range of acceptable prices, and to label pricing points of interest. The functions MOVE, DRAW, and LABEL control the annotation. XSYS and YSYS values of "2" are used to designate annotation in terms of the data axes: Values of "3" designate annotation in terms of absolute percent of the screen.

Conclusions

Of primary importance is the opportunity for market research professionals to collect their own consumer price perceptions, then apply the computer code described and provided in this paper to obtain meaningful product pricing information. These techniques are best suited for products/services with which respondents have some former familiarity. A black and white illustration of the output from this procedure follows.

DATA ANNO;
LENGTH FUNCTION S 8. COLOR S 8. TEXT S 25.;
FUNCTION='MOVE'; X= ; Y= ; XSYS='2'; YSYS='3'; OUTPUT;
FUNCTION='DRAW'; X= ; Y= ; XSYS='2'; YSYS='2'; COLOR='RED'; LINE=3; SIZE=2; WHEN='A'; OUTPUT;
FUNCTION='LABEL'; SIZE=1; X= ; Y= ; COLOR='BLUE'; TEXT='TOO HIGH'; XSYS='2'; YSYS='2'; OUTPUT;

DATA ONE;
INFILE INDATA;
INPUT PRICE D
PRICE_C
PRICE_A
PRICE_B
5 - 7
8 -10
11 -13
14 -16;
LABEL PRICE D='PRICE'
PRICE_C='PRICE'
PRICE_A='PRICE'
PRICE_B='PRICE';

DATA THREE;
SET PRICE_D;
RETAIN NOT_LOW 0;
NOT_LOW = NOT_LOW
+ PERCENT;
LABEL NOT_LOW='PERCENT';

DATA FOUR;
SET PRICE_B;
RETAIN CUM_B 0;
CUM_B = CUM_B + PERCENT;
TOO_LOW = 100 - CUM_B;
LABEL TOO_LOW='PERCENT';

DATA FIVE;
SET PRICE_C;
RETAIN HIGH 0;
HIGH = HIGH
+ PERCENT;
NOT_HIGH = 100 - HIGH;
LABEL NOT_HIGH='PERCENT';

DATA SIX;
SET PRICE_A;
RETAIN TOO_HIGH 0;
TOO_HIGH = TOO_HIGH
+ PERCENT;
LABEL TOO_HIGH='PERCENT';

PROC GPLOT DATA=SEVEN ANNOTATE=ANNO GOUT=SAVE.PRICE;

SYMBOL I=SM60 C=GREEN;
SYMBOL I=SM60 C=VIOLET;
SYMBOL I=SM60 C=CYAN;
SYMBOL I=SM60 C=ORANGE;

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Note: The actual price values have been suppressed.

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