A Strategic Model of Price, Quality and Value

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Abstract

"How do we gain market share?" is a critical question, and the answer is usually anything but obvious. The ability to answer the question correctly is the hallmark of a growing and profitable company. This article presents a model of price, quality and value that can be used to explore answers to the question of market-share gain. The model is strategic in the sense that all measures are defined relative to the competition.

Introduction

Many business strategists advise clients to "get market share and the profits will follow." Hard evidence to support this view comes from the PIMS database of 2500 strategic business units supplied by a blue-chip list of United States and European companies. According to Buzzell and Gale (1987), in the PIMS database, businesses with over 60% market share earn a ROI of 42% versus a ROI of 12% for businesses with market shares under 10%. The link between share and profitability is confirmed by research on other databases by Marshall and Buzzell (1990) and by research on other countries by Kotabe, Duhan, Smith and Wilson (1991).

The drive for market share is most compulsive in new ventures and high-technology markets, where steep experience curves magnify the cost advantages of the dominant player. In fact, some experts believe that small players cannot survive in this environment. To quote Bruce Henderson (1979, p.90), the founder of the Boston Consulting Group, "any competitor with less than one-quarter the share of the largest competitor cannot be an effective competitor and ... if there are large number of competitors, a shakeout is nearly inevitable."

However, the respect for market share is not universal. Porter (1980) and Hax and Majluf (1984) point out that in fragmented industries (e.g., restaurants) or specialty industries (e.g., consulting) market share is not an important performance driver. Moreover, as discussed by Schoeffler (1977) and by Woo and Cooper (1981), even in industries where market share does pay off, it may be too costly for a business to gain share and the right strategy may be to hold or harvest market share.

Nevertheless for many businesses, the question "How do we gain market share?" is a correct and important

one to ask.

There are a wide range of modeling approaches to answering that question. One common approach is to develop a regression equation in which market share is regressed against such variables as advertising, promotion, and relative price. Another approach is to survey customers to identify how quality can be improved and share gained.

The survey approach is popular in practice. A survey can explore "soft" emerging trends and attitudes. A survey is also well suited to investigating such nitty-gritty questions as: "Should we add a new color of phone?" And it is on these little things that market-share battles are often fought and won.

The price, quality and value (PQV) model presented in this article belongs in the survey category. The PQV model provides an overarching logic that can integrate survey insights into a framework for strategic analysis. The model will be described, after a brief review of the literature on quality. Then in the concluding section, I will identify some limitations of the PQV model and discuss alternative approaches.

Review of Quality Literature

Quality is a cost-effective way to build market share. At a minimum, by providing a high-quality product, a company can effectively lock-in existing customers. According to Rose (1991), Ford Motors estimates that it costs four times as much to attract a new customer as it does to retain an old one. It is also clear that disappointed customers rarely complain about poor quality; they just walk away. A study of 2,500 families by the consulting firm of TARP found that only one out of six major quality problems reach headquarters and 9 out of

10 disappointed buyers do not repurchase from offending companies (Goodman, 1981).

One sign of the new emphasis on quality is the Malcolm Baldrige National Quality Award, awarded each year by the U.S. Department of Commerce (1991). Four years ago it didn't exist. Now it has become a most sought after award -- a sort of "Oscar" for business, whose winners include IBM, Xerox and Federal Express. Simply applying for a Baldrige can reveal holes in a company's quality program, because of a grueling application process that covers: 1) leadership; 2) information and analysis; 3) strategic quality planning; 4) human resource utilization; 5) quality assurance of products and services; 6) quality results; and 7) customer satisfaction.

As the Baldrige application shows, there are multiple definitions of quality and this makes it useful to review the developments that have given rise to our current understanding of this concept.

Manufacturing-Driven Quality

According to manufacturing expert, Philip Crosby (1979), a former Vice President of IT&T, quality is a defect-free product and a defect is a failure to "meet management specifications."

In the early part of the century, quality management consisted of inspection to screen out defective products. In 1931, statistical quality control (SQC) was introduced by Walter Shewhart of Bell Labs as a way to prevent defects by identifying the root causes. The premise of SQC is that most defects are due to systemic factors and statistical charting can help to flag these factors. Incidentally, also at Bell Labs was W. Edwards Deming who extended SQC and introduced it in Japan in 1950.

In the 1960s, the cost of quality (COQ) system was introduced as a tool to prioritize defects by measuring the costs they create. The COQ identifies all costs that do not exist in a "zero-defects" environment. Thus COQ pinpoints the most costly defects for elimination. The COQ system is fully described by the American Society for Quality Control (1971).

During the 1980s, United States companies began to adopt Japanese practices like just-in-time inventory control (kanban), quality circles, and continuous quality improvement (kaizen). The reported improvements have been dramatic. At one General Motor's plant, defects were reduced 90% and factory floor space reduced 46% by borrowing Japanese techniques (White and Stertz, 1991).

Consumer Utility

The concept of utility, or consumer satisfaction, dates back to the work of Walras in 1874 and Marshall in 1890 (for a review, see Stigler, 1968). Walras and Marshall both assumed utility was cardinal -- that is, measurable -- and Walras used subjective units called utils, to measure utility. The utility model assumes a rational customer who seeks to maximize utility in the same way that a firm seeks to maximize profits.

Utility theory has been extended by mathematicians, economists and marketing scientists. Most notably, Von Neumann and Morgenstern (1944) used game-theory to incorporate risk into the utility model. These days, we see utility models that incorporate risk and multi-attribute scales -- such as the model by Hauser and Urban (1979) -- as well as models with non-linear functions -- for example, the model by Schlee (1991). Utility models have been applied to a variety of issues, including the process used by consumers to select between competing brands.

The utility-maximizing approach is not without its critics. For example, Nobel Laureate, Herbert Simon (1987) is critical of the premise that the consumer always acts rationally. He writes, "Economics has almost uniformly treated human behavior as rational. Psychology, on the other hand, has always been concerned with both the irrational and rational aspects of behavior." Simon has proposed a less restrictive model based on "bounded rationality" and "satisficing" behavior.

Strategic or Market-Driven Quality

The terms market-driven quality and strategic quality have become popular in the last decade. However, in many ways these terms are really analogous to the familiar concept of utility. For example, the Marketing Science Institute (1991, p.1) states that "market-driven quality achieves total customer satisfaction through the timely marketing and delivery of products and services offering value to the customers that is superior to competitors."

Companies are integrating market-driven quality measures into their operations. This phenomenon is typified by Xerox, whose share of U.S. copier revenues fell from 96% in 1970 to 46% by 1980. Says David Kearns (1990, p.87), the former Chairman and CEO, "Xerox entered the 1980s with a new vision I told our employees that customer satisfaction would be our top priority and that it would change the culture of our company. We redefined quality as meeting the requirements of our customers. It may have been the most significant strategy Xerox had ever embarked upon."

To measure market-driven quality, some researchers

such as Garvin (1988) have proposed that a common set of attributes, such as "reliability", be used for every industry, while others like Thompson, DeSouza and Gale (1985) have argued that the attributes should be custom selected by market.

Measuring Strategic Quality

The literature suggests that a useful measure of quality will be customer-based, competitively-focussed, and integrable with programs to improve manufacturing quality. The definition I use tries to meet these sometimes conflicting objectives.

First, quality is as defined by the customer. Second, price is excluded from the definition of quality. Third, quality is defined to include everything that influences the customer's purchase decision -- product features, delivery, installation, warranty, prestige etc. Fourth, quality is measured using a multiattribute utility model, with the assumption of weighted-additive utilities. Fifth, quality is measured within the served market -- that is for companies that sell directly competitive products. Sixth, the quality attributes are market specific -- no single schema can meaningfully represent products as diverse as \$20 calculators and \$20 million jets. Seventh, the quality attributes are actionable (e.g., delivery time) not abstract (e.g., responsiveness). Eighth, risk is integrated into the process, not handled separately. Risk-averse customers can reflect their fears by heavily weighing attributes that can go wrong and by rating highly those companies with solid reputations. Ninth, the quality data are collected "blind" to ensure that customer's responses are not contaminated by their desire to send a message to management. Tenth, the quality data are collected from random samples drawn from the following mutually exclusive strata: 1) new customers, 2) long-time customers, 3) recently lost customers, and 4) long-time competitor's customers.

To illustrate the process used to calculate strategic quality, I will use a disguised case study of the key telephone systems market. Detailed information on this market is published by Northern Business Information Inc., (1991). Key systems are bought by small businesses with between 5 and 50 employees. Typical customers include medical clinics, travel agencies, and furniture stores. Key systems cost between \$10,000 and \$40,000 and contain such standard features as intercom, conferencing, paging and least-cost routing.

Not surprisingly, the key systems market is still dominated by the relics of the old Bell system. Customers generally buy their phone system from ATTIS (AT&T Information Systems) or from the local Bell Operating Company (e.g., Southwest Bell in St Louis). But there are many independent dealers in the market who offer excellent imported systems (Toshiba, NEC,

and Isoetec are the most well known) at very competitive prices.

Quality weights

As a first step, customers were asked to weight the attributes to satisfy the following condition:

$$\sum_j W_j = 100 \quad (1)$$

where

W_j is the weight placed on attribute j

The attribute weights for key systems, which are presented in Figure 1, indicate that customers are highly risk-averse. This risk aversion is reflected in the priority they attach to emergency service, warranty, and corporate continuity. Buying a \$20,000 telephone system that will be at the heart of a business is a major risk. Customers are filled with worries: Will the dealer provide prompt service? Can new lines be added later? Will the dealer go out of business? These are all legitimate concerns.

Figure 1
Quality Attribute Weightings
Key Telephone Systems

Quality ratings

Next, the customers were asked to rate the companies on each quality attribute on a 0 to 10 scale. Typically, a rating of 6 or lower signifies a problem and a rating above 8 signifies a strength. The ratings, which are presented in Table 1, indicate that ATTIS' great strength is its "continuity", while the independent's have superior phone systems and sales force.

Raw quality score

For company k, the raw quality score is calculated as the product of the weights from Table 1 and the ratings from Figure 1.

$$RQ_k = \sum_j W_j * K_{jk} \quad (2)$$

where

RQ_k is the raw quality score for company k
 W_j is the weight for attribute j
 K_{jk} is the rating on attribute j for company k

Market quality score

This score is calculated as the market-share weighted average of the raw quality scores. The formula is

$$MQ = \sum_k RQ_k * MS_k \quad (3)$$

where

MQ is the market quality score
 RQ_k is the raw quality score of company k
 MS_k is the market share of company k

Strategic quality index

The index (Q_k) is calculated as the ratio of a company's raw quality score to the market quality score. Note that there will be an index value for each observation i.

$$Q_k = \frac{RQ_k}{MQ} \quad (4)$$

Table 1
Competitive Quality Ratings
(Disguised Data on Key Telephone Systems)

Attributes	ATTIS	KeyTel	Davis
Ease of Use	6	8	9
Durability	8	7	7
Standard Features	6	8	8
Optional Features	5	5	7
Sales Representation	4	7	6
Installation	7	6	4
User Training	4	4	2
Emergency Service	8	7	4
Routine Service	7	6	3
Warranty	6	6	6
Continuity	10	4	2

Strata means

We next calculate the strategic quality index for each sample strata. If we have m strata, then for each strata the mean index for company k can be calculated by:

$$\overline{Q}_{km} = \frac{\sum_i Q_{kmi}}{n_i} \quad (5)$$

where

Q_{km} is the quality index for company k for strata m

Q_{kmi} is observation i on Q_{km}

n_i is the strata sample size

General mean

The overall mean index for company k can be calculated as a weighted average of the strata means. The formula to do this is:

$$\overline{Q}_k = \sum_m N_m * \overline{Q}_{km} \quad (6)$$

where

Q_k is the general sample mean

N_m is the share of the population accounted by strata m

Strata confidence intervals

If the sample is randomly selected within each strata, we can calculate a confidence interval for the strata means using the central-limit theorem, which states that there is a 95% probability that the true mean lies between approximately 2 standard deviations of the sample mean. Additionally, if, the number of customers is small, we must apply a finite population correction factor $(N_i - n_i)/N_i$. If we designate the standard deviation of strata m by s_m , then the 95% confidence interval for the strata mean is written as:

$$\overline{Q}_{km} \pm 2 * \sqrt{\frac{s_m^2}{n_m} \left(\frac{N_i - n_i}{N_i} \right)} \quad (7)$$

General confidence interval

The formula to calculate the 95% confidence interval for the general mean is:

$$\overline{Q}_k \pm 2 * \sqrt{\frac{1}{N^2} \sum_i \left(\frac{N_i - n_i}{N_i} \right) \frac{s_i^2}{n_i}} \quad (8)$$

Measuring Strategic Price

Customers often do not know how much they have paid for a product. This is especially true for small items like cereals or toothpaste. This raises the question whether actual or perceived price should be used in the model. I suggest using actual price because it is usually an unbiased estimator of perceived price.

In any event, it is important to use transactions prices, not list prices to compare competitors. For consumer markets, getting a competitor's transaction prices can be as simple as reading the advertisements or visiting a supermarket or dealer showroom. In industrial markets, the list price is often a fiction because of flexible discounts. Nevertheless, even in industrial markets, it is possible to obtain readings on competitor's transactions prices by talking to mutual customers.

Preferential financing can complicate the comparison of prices for products that are usually bought on credit. For example, automobile companies, via their leasing subsidiaries, often provide very low interest financing. In these markets, it is appropriate to calculate the price for each competitor as the net present value of the payments, discounted using the market interest rate.

Once the pricing data have been collected, the strategic price index for a company is calculated in two steps: first we calculate the market price and second, we calculate the strategic index. The market transactions price (MP) is calculated as a weighted average of the prices of the individual competitors. The formula to do this is:

$$MP = \sum_k IP_k * MS_k \quad (9)$$

where

MP is the market price

IP_k is the actual transactions price for company k

MS_k is the market share for company k

For company k , the strategic price index (P_k) is calculated as the ratio of its price (IP_k) to the market price (MP):

$$P_k = \frac{IP_k}{MP} \quad (10)$$

Measuring and Mapping Value

Many years ago Drucker (1974, p. 84) spoke to the centrality of value when he said "the customer never

buys a product. By definition the customer buys satisfaction of a want. He buys value."

But what exactly is value? There are few words in the English language that are as ambiguous as value. Webster's, for example, defines "value" as "that quality of a thing according to which it is thought of as being more or less desirable, useful, estimable, important, etc." This definition seems to say value is quality.

Marketing experts, however, agree that while value must include some consideration of quality, value goes beyond quality. For example, Tellis and Gaeth (1990, p. 34) state that "best value is choosing the brand with the lowest total expected cost." Zeithaml (1988) asked consumers what "value" meant to them and found that consumers define value in four basic ways: 1) value is low price; 2) value is whatever I want in a product; 3) value is the quality I get for the price I pay; and 4) value is what I get for what I give.

In the PQV model, value is defined as "the quality I get for the price I pay." This definition is analogous to the economists notion of consumer surplus. The formula to measure value is:

$$V_k = \frac{Q_k}{P_k} \quad (11)$$

where

V_k is the value index for company k

Q_k is the strategic quality index for company k

P_k is the strategic price index for company k

In the model, market demand is exogenous -- the consumer has decided to buy the product (e.g., automobile) and the only question is which brand to select. If we designate $P_{\max}$ as the maximum amount the consumer would be willing to pay, then the economic set consists of all brands i for which $P_i < P_{\max}$. The rational set is developed by excluding from the economic set any non-dominant options. If one product is better than another in one dimension, such as high quality, and at least as good on other dimensions, such as low price, then it has dominance. The optimal choice is made by selecting from the rational set, the brand with the highest value ratio.

Figure 2 presents a value map for the key systems market. In the figure, the "value line" separates the high-value participants from those who offer low value. Those players, like Davis, positioned below the value line offer better-than-average quality for the price and are in a gain-share zone. By contrast, KeyTel and ATTIS are positioned above the value line in the loss-share zone,

because, although both companies offer higher quality than Davis, their quality advantage does not fully justify their price premium.

To reposition itself on the value map, a company can improve quality or cut price. As a general rule, improving quality is a surer way to gain share than cutting price. An improvement in quality is less likely to provoke a direct matching response from the competition. It takes time, effort and investment for a competitor to match a quality change. In effect, the share earned through higher quality is more likely to be permanent than the share bought by lower price. Also, a small player can often do things on quality that are impractical or unfeasible for the majors to match. For example, putting in a two-year warranty is feasible for a start-up business, but not for a business with a huge installed base.

Extending the Model

So far it has been assumed that the customer will always select the highest-value option. This, of course, is the economically rational and optimal choice. But because of distorting influences, customers may not select the brand that they believe offers the highest value.

In a "quality-seeking" market, customers place a disproportionate weight on quality. Quality-seeking behavior is likely in markets where the customer is not paying the bill and/or the product or service meets a critical need. For instance, a person will select the very best doctor, irrespective of cost, if the fees are being paid entirely by his or her insurance policy.

In a "price-seeking" market, customers place a disproportionate weight on price. Price-seeking behavior is likely in markets where the person paying the bill is not using the product. This behavior is common in government procurement. For example, a jail warden will likely select the lowest cost vendor for the prison food supply.

To identify the behavior that characterizes the market, it is necessary to fit the following regression equation:

$$MS_k = a + (b * Q_k) - (c * P_k) \quad (12)$$

where

MS_k is market share of company k

Q_k is the strategic quality index of company k

P_k is the strategic price index of company k

The equation's coefficients identify the impact of quality and price on share. Now, the value line is

Figure 2
Value Map

defined as all points where there is no change in share - in other words, the value line is an indifference curve along which the changes in quality and price cancel each other out to leave the customer with the same value. This means that the slope of the value line is the ratio of the quality coefficient "b" to the (absolute value) of the price coefficient "c". If $b > c$ the market is quality seeking, if $b < c$ the market is price seeking and if $b = c$ the market is value seeking. Figure 3 presents three value lines. For a given quality level (Q) the price-seekers will pay P3, the value seekers P2, and the quality seekers P1; where $P3 < P2 < P1$. Note that $P2 = Q$, because the value line has a slope of 1.0, since $b = c$.

Equation (12) assumes a linear relationship; a reasonable choice given that the independent variables are indices. It is useful to experiment with other functional forms. For example, it may be interesting to fit a log-log relationship, in which case the coefficients are interpreted as elasticities. Yet another popular possibility is to fit a logit model, which is suited to market-share analysis,

because the dependent variable is constrained between 0.0 and 1.0. There is, however, a unique expository advantage, in staying with the linear model -- its coefficients directly define the value line.

Conclusions

Market share is an important goal. There is a substantial body of evidence -- theoretical, statistical and anecdotal -- to indicate that high-share businesses enjoy superior profitability. Therefore, the question, "How do we gain market share?" is an important one to ask.

This article has presented a model of price, quality and value (PQV) that can be used to explore answers to that question. The model has a strategic and policy focus and evolved through consulting assignments with clients who wanted to identify policies to gain market share. The PQV model has been applied to the markets for telecommunications, restaurant supplies, oilfield equipment, and industrial batteries.

Figure 3

Alternative Behavioral Models

The PQV model assumes rational consumer behavior. It assumes that the customer can identify and weight the specific attributes that a product represents. This assumption is most valid in industrial markets; or other markets, where the purchase decision is made after a careful consideration of needs and alternatives.

A limitation of the PQV model is that it is not well suited to markets where image and emotion play a dominant role. In such markets, it is useful to take into account, psychological and sociological considerations (Kotler, 1965; Wells and Beard, 1973). In such markets, it is useful to recognize that the customer may see the product as a means to fulfill an emotional end. To capture this dynamic, a means-end model can be used. To quote, Gutman and Alden (1985, p. 101), "the means-end model seeks to explain how a person's choice of a product or service enables him or her to achieve his or her desired end states."

A key premise of the means-end model is that "product information is retained in memory at several levels of abstraction. The simplest level is a product attribute; the most complex level is the value or payoff of the product to the consumer" (Zeithaml, 1988, p. 5). To link means to ends, a qualitative "laddering" process can be used (e.g., Olson and Reynolds, 1983) or the links can be modeled by the use of cues and benefits (e.g., Mehrotra and Palmer, 1985). The cue is a factual thing from which the customer can infer a benefit that may result.

A second limitation of the PQV model is that it assumes that price and quality are independent. In other words, it assumes that customers can evaluate the quality of a product without considering the price it carries. However, it has long been argued that customers may use price as a way to judge quality, especially if they lack technical knowledge. For example, Gardner

(1970) found that in mens clothing, a high price is used by customer to infer high quality. In markets like this, it will not be appropriate to use the PQV model.

A third limitation of the PQV model is that it requires the collection of primary data; a process which may be expensive. If excellent secondary data exists, it is a simple exercise to fit an econometric model by regressing market share against the variables that determine share. Secondary data may come from government agencies, trade associations, private research firms and scanners. For example, Bajic (1988) has developed a market share model of the automobile industry using data such as the quality ratings published in *Consumer Reports*. Similarly, Bechtel (1990) has developed a model of the cereal industry using data on market shares for 54 cold cereals from *Advertising Age* and data on advertising expenses from the BAR/LNA Multi-Media Service. Yet another interesting example is provided by Waarts, Caree and Wieraranga (1991), who use supermarket scanner data to develop market share models for grocery products.

The limitations of the PQV model result from its use of survey data and its assumption of rational consumer behavior. At the same time, these methodological characteristics of the PQV model offer significant advantages. It is possible that in the next few years we will see the development of truly, interdisciplinary, market share models. These models would integrate in a seamless manner, methodologies from a variety of disciplines. The challenge will be to do this while keeping the model simple and flexible enough to meet the needs of business managers.

Ultimately, developing a successful strategy for gaining market share is an exercise in intuition, judgement and creativity. A model can, at best, guide and stimulate the choice of strategy. The PQV model presented in this article can be helpful in that context; especially for companies that sell industrial products. The PQV model provides a framework that can help management explore within a competitive context, options for gaining market share by managing quality, price and value.

Suggestions For Future Research

There is an enormous body of research on market share. Moreover, the issue of market share has been studied by specialists in marketing, econometrics, engineering and strategic planning. For fresh insights into market share dynamics, we need research that integrates the perspective of the different disciplines. In this context, two areas offer particular promise.

First, future studies should consider incorporating psychological and sociological considerations into the

quality tableau that was presented in this article. The tableau is based on the premise of a rational customer who carefully evaluates performance attributes. However, in the real world, some customers are driven by emotion, as often as reason. Therefore, it would be interesting to include another dimension which captures the manner in which the performance-attributes impact emotional-attributes.

Second, engineering concepts should be integrated into the model. This ensures that customer needs find their way down to the new product development department in a systematic way. Some work has already been done in this regard in the form of quality functional deployment (QFD), an approach, which uses a grid that links customer needs into engineering/design requirements.

In building an interdisciplinary model, it may be helpful to take a team approach. It is difficult, to say the least, for someone trained in economics to manipulate psycho-social constructs or design engineering grids. With a team approach it will be easier to resolve the conflicts and overlaps between the different disciplines.

References

1. American Society for Quality Control. (1971). *Quality costs - what & how*. Milwaukee: Author.
2. Bajic, V. (1988). Market shares and price-quality relationships: An econometric investigation of the U.S. automobile market. *Southern Economic Journal*, 54, 888-900.
3. Bechtel, G. G. (1990). Share-ratio estimation of the nested multinomial logit model. *Journal of Marketing Research*, 27, 232-237.
4. Buzzell, R. D., & Gale, B.T. (1987). *The PIMS principles: linking strategy to performance*. New York: The Free Press.
5. Crosby, P. B. (1979). *Quality is free*. New York: New American Library.
6. Drucker, P. (1974). *Management: tasks, responsibilities and practices*. New York: Harper & Row Publishers.
7. Gardner, D. M. (1970). An experimental investigation of the price-quality relationship. *Journal of Retailing*, 46, 24-41.
8. Garvin, D. A. (1988). *Managing quality*. New York: The Free Press.
9. Goodman, J. (1981). *Consumer complaint seminar presented for Nippon Cultural Broadcasting Company: Summary of White-House complaint handling study*, Tokyo, Japan.
10. Gutman, J. & Alden S.D. (1985). Adolescents' cognitive structures of retail stores and fashion consumption: A means-end chain analysis of quality. In J. Jacoby & J. Olson (Eds.), *Perceived Quality*

- (pp. 99-114). Lexington, MA: Lexington Books.
11. Hauser, J. & Urban G. (1979). Assessment of attribute importance and consumer utility functions: Von-Neumann-Morganstern theory applied to consumer behavior. *Journal of Consumer Research*, 5, 252-262.
 12. Hax A.C. & Majluf, N. S. (1984). *Strategic management: an integrated perspective*. Englewood Cliffs, NJ: Prentice Hall.
 13. Henderson, B. (1979). *Henderson on corporate strategy*, Cambridge, MA: Abt Books.
 14. Kearns, D. T. (1990). Leadership through quality. *Academy of Management Executive*, 4 86-89.
 15. Kotabe, M., Duhan, D.F., Smith, D.K., & Wilson, D.R. (1991). The perceived veracity of PIMS strategy principles in Japan: An empirical inquiry. *Journal of Marketing*, 15, 26-41.
 16. Kotler, P. (1965). Behavioral models for analyzing buyers. *Journal of Marketing*, 29, 37-45.
 17. Marketing Science Institute. (1991). *Managing market-driven quality*. Cambridge, MA: Author.
 18. Marshall, C. T. & Buzzell R.D. (1990). PIMS and FTC line-of-business data: a comparison. *Strategic Management Journal*, 11, 269-282.
 19. Mehrotra, S. & Palmer J. (1985). Relating product features to perceptions of quality: appliances. In J. Jacoby & J. Olson (Eds.), *Perceived Quality* (pp. 81-96). Lexington, MA: Lexington Books.
 20. Northern Business Information Inc. (1991). *Key telephone systems market: 1991 edition*. New York: Author.
 21. Porter, M. E. (1980). *Competitive strategy: techniques for analyzing industries and competitors*. New York: The Free Press.
 22. Rose, F. (1991, April 22). Now quality means service too. *Fortune*, pp. 97-112.
 23. Schlee, E. E. (1990). Multivariate risk aversion and consumer choice. *International Economic Review*, 31, 737-745.
 24. Schoeffler, S. (1977). *Market position: build, hold or harvest*. Cambridge, MA: The Strategic Planning Institute.
 25. Simon, H. A. (1987). Rationality in psychology and economics. In R. M. Hogarth & M.W. Reder (Eds.), *Rational choice: the contrast between economics and psychology* (pp. 25-40). The University of Chicago Press.
 26. Stigler, G. (1968). The development of utility theory. In A. N. Page (Ed.) *Utility theory: a book of readings* (pp. 55-119). New York: John Wiley & Sons Inc.
 27. Tellis, G. J. & Gaeth, G. (1990). Best value, price-seeking, and price aversion: The impact of information and learning on consumer choices. *Journal of Marketing*, 54, 34-45.
 28. Thompson, P., DeSouza G., & Gale, B. (1985, June). Strategic management of service quality. *Quality Progress*, 20-25.
 29. U.S. Department of Commerce, National Institute of Standards and Technology. (1991). *1991 Application guidelines: Malcolm Baldrige National Quality Award*. Gaithersburg, MD: Author.
 30. Von Neumann, J., & Morganstern, O. (1944). *The theory of games and economic behavior*. Princeton, NJ: Princeton University Press.
 31. Waarts, E., Caree, M., & Wierenga, B. (1991). Full information maximum likelihood estimation of brand positioning maps using supermarket scanning data. *Journal of Marketing Research*, 28, 483-490.
 32. Wells, W.D., & Beard, A.D. (1973). Personality and consumer behavior. In S. Ward & T.S. Robertson (Eds.), *Consumer behavior: theoretical sources* (pp. 141-199). Englewood Cliffs, N.J.: Prentice Hall.
 33. White, J. B., & Stertz, B.A. (1991, May 2). Crisis is galvanizing Detroit's big three. *Wall Street Journal*, pp. B1, B9.
 34. Woo, C. & Cooper A.C. (1981). Strategies of effective low share businesses. *Strategic Management Journal*, 2, 301-318.
 35. Zeithaml, V. A. (1988). Consumer perceptions of price, quality and value: a means-end model and synthesis of evidence. *Journal of Marketing*, 52, 2-22.