Pricing Fundamentals

Price is a pivotal "P" in the marketing mix since it pegs value in the marketplace and bounds company profitability.

That is, customers calibrate 'value' by balancing the level of benefits they receive from a product with its price. And importantly, companies are usually able to retain some of the value they create (over their costs to produce) as profits

From a customer / buyer's perspective, simply stated, value is the relationship between a product's monetized benefits and its price.

"Price" is the full economic consideration expended to acquire and use a product. The expenditure can be cash at the time of acquisition, interest paid to finance the purchase, operating costs over the life of the product, imputed opportunity costs for time spent searching, etc.

A lower price - holding the level of product benefits constant – translates to more value; a higher price means less value. Similarly, increasing the level of benefits while holding price constant increases value.

From a company / supplier's perspective, price is a key determinant of profitability. Profit margins are the difference between prices and costs. So, higher prices mean higher margins per unit sold; lower prices mean lower margins.

But, total profits (i.e. dollars to the bottom line) depend on both unit margins and sales volume, and sales volume is driven by demand, which is tightly linked to price.

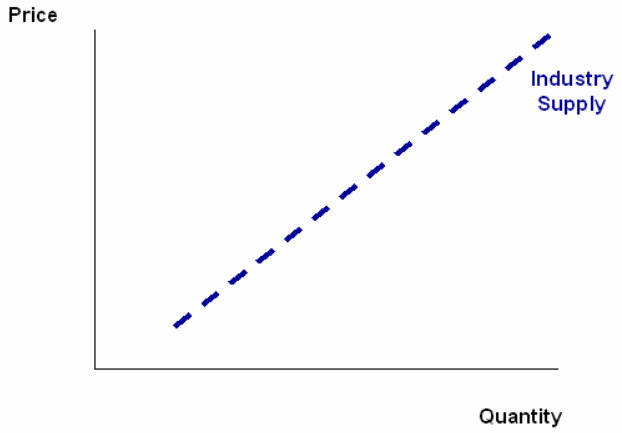
Lower prices stimulate demand since they increase value and affordability. If demand increases (on a percentage basis) more than prices decrease, then total revenues (price times sales volume) will go up.[1] . But, lower prices cut unit margins unless volume increases drive lower costs (through scale or learning effects). So, total profits may increase or decrease, depending on the specifics of the situation.

Again, from the microeconomic perspective of individual companies and customers, price is the mechanism for balancing the value delivered to customers with the profits retained by companies.

Supply and Demand

Taking a broader industrywide macroeconomic perspective, price is the mechanism for balancing aggregate supply and demand in the market.

In general, industry supply curves are upward sloping, indicating that aggregate quantities supplied increase as price goes up.[2]



Intuitively, it seems reasonable to expect that higher prices would induce more companies to supply greater volumes of goods to the market since:

(a) The most cost-effective companies are positioned to earn greater profits as prices move up, and may expand capacity

(b) Less cost-effective companies may enter the market if they are able to eek out a satisfactory profit at higher prices despite their disadvantaged cost positions.

Conversely, lower prices depress supplies as producers become economically demotivated. Profits erode as prices fall, eventually leading suppliers to reduce output or abandon the market entirely (with profit-oriented, higher cost producers being the first ones out).

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This note was developed by Prof. Ken Homa as background for class discussions and is incomplete without extensive supplemental oral elaboration.

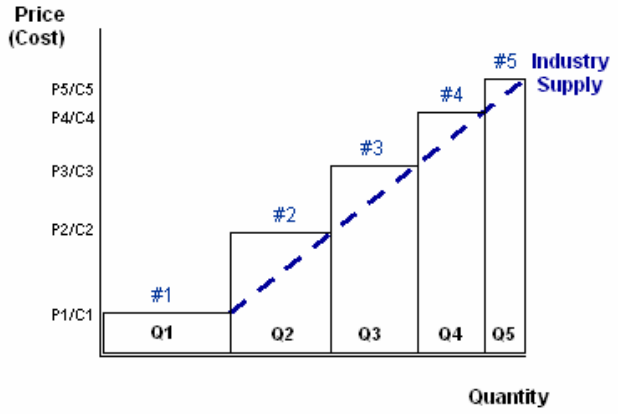
[1] This relationship - called price elasticity – is discussed in more detail later in this note.

[2] The conventional way of displaying supply and demand curves is to have quantity on the horizontal axis and price on the vertical axis. To be technically correct, such a curve is an "inverse supply curve" or "inverse demand curve". A true supply or demand curve has price (the independent variable) on the horizontal axis and quantity (the dependent variable) on the vertical axis. The price-quantity relationship is, of course, unaffected.

Analytical Note

*A standard strategic analysis is to determine the **relative cost positions** and capacities of all competitors in a market. When the capacities are aggregated sequentially based on cost positions (low to high), the result is a strategically relevant industry supply curve, since companies should be willing to supply the market if price is greater than their cost (plus a satisfactory level of profit)*

Industry Supply



For example (exhibit above), if C1 is competitor #1's cost to produce and the going price is equal to or greater than C1, then #1 will supply its full capacity (Q1) to the market. At a price level (P1) corresponding to C1, no other manufacturers would supply the market since the price is less than their profit-loaded cost to produce. If prices were to rise to a level P3 (equal to C3), then competitors #2 and #3 would be induced into the market (since price is now greater than or equal to their costs). At price P3, #1's profits are obviously greater than they were at P1.

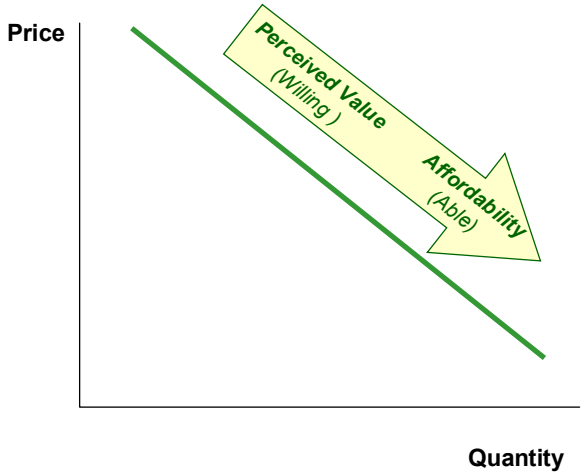
While lower prices usually depress supply, they tend to stimulate greater demand since:

(a) Lower priced products (that deliver a comparable level of benefits) offer a better value to all customers, more of whom will be interested in buying the product (i.e. they are more ***willing to buy***), and

(b) Lower priced products are more affordable to customers who are willing to buy (i.e. more people are both willing and ***able to buy***).

So, the typical industry demand curve (illustrated below) is downward sloping: the higher the price, the lower the quantity demanded; the lower the price, the higher the quantity demanded

Industry Demand



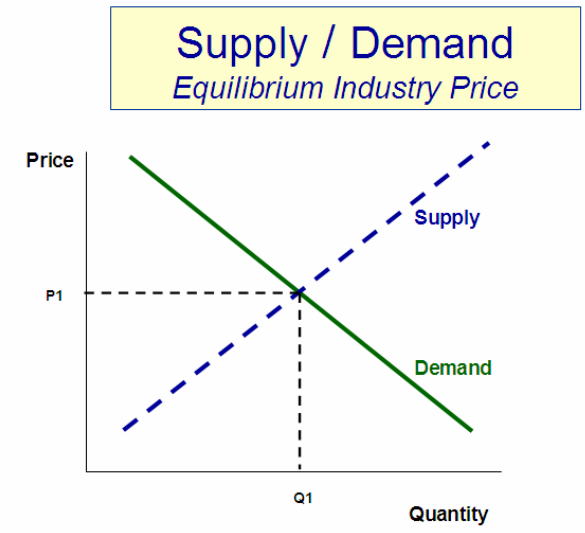
Analytical Note

Estimating demand curves is a formidable challenge. Catalogers and online retailers sometimes test alternative price points to, in effect, calibrate their products' demand curves. For example, in September 2000, Amazon was "busted" varying prices to customers (or to the same customer logging in at different times). When accused of intentional price discrimination, the company responded: "Amazon varied the discount levels on a totally random basis, not with respect to customer demographic information. The purpose of the test was to determine how much sales are affected by lower prices." [3]

More conventional test marketing and other research techniques (e.g. semantic scaling, conjoint measurement) can provide valuable insight, but sometimes render a level of precision that is more apparent than real.

Managers must often make decisions based on experientially-formed subjective judgments regarding the demand curve's shape and slope. These subjective estimates are usually "better than nothing" since, at a minimum, they provide a conceptual framework for decision-making and, in many cases, the judgmental calibration is "good enough" for framing pricing decisions.

The intersection of the upward sloping supply curve and the downward sloping demand curve is the market's ***equilibrium price:*** the price that "clears the market" by balancing aggregate supply and demand.



Perfectly Competitive Markets

The practical relevance of the equilibrium price depends on the competitive structure of specific markets.

At one extreme, from an economist's conceptual perspective, are so-called ***perfectly competitive markets.***

Perfectly competitive markets (also referred to as ***perfect markets*** or ***efficient markets***) are characterized by:

(a) Identical or fundamentally undifferentiated products that are mutually substitutable

(b) No barriers to competitive entry

(c) No "natural" constraints on supplies (such as raw material shortages)

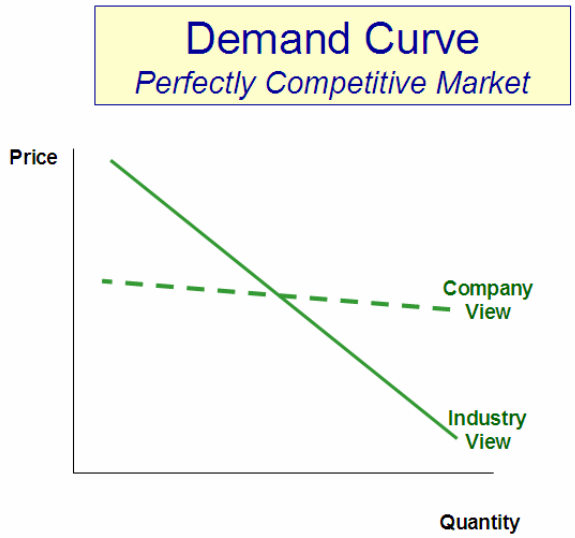
(d) Many relatively small buyers and sellers, none with sufficient clout to individually impact prices

(e) Broad-scale availability of relevant, accurate, and easy-to-access information

(f) Rational decision-making by both buyers and sellers

Under these perfect market conditions the equilibrium price is the prevailing market price.

The aggregate industry demand curve in perfect markets has the familiar downward slope, suggesting a variety of price options are available. But, individual competitors, who are, by definition, relatively small, face horizontally flat demand curves, and what amounts to a single price choice.



[3] Dow Jones Business Wire, September 27, 2000.

That is, while the industry demand curve may be downward sloping (most are!), the demand curve relevant to each competitor in perfect markets is essentially horizontal, and price is a given.

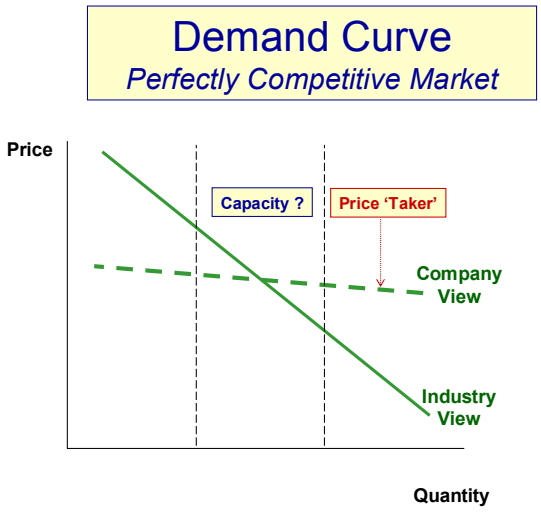
More specifically, all competitors in a perfectly competitive market can:

(a) Sell whatever quantity they wish at the market-determined equilibrium price (subject to their capacity constraints)

(b) Sell at lower prices and unnecessarily forego profits (since buyers are willing to pay more).

(c) Attempt to sell at prices higher than the equilibrium, recognizing that they are unlikely to attract many buyers since there is – by definition - a plentiful supply at the equilibrium price.

In other words, companies in perfect markets are ***price-takers*** who "read" the market price and make a fundamental decision: how much capacity (if any) to dedicate to the product / market. That is, what quantity to supply.



The capacity decision can be analytically determined based on core profitability factors: price, revenue, costs, and investment.

Short-run, companies will supply the market up to the limits of their in-place capacity (assuming that they are already in the business) if the prevailing price is greater than their marginal cost (i.e. the cost of the next unit to be produced).

Longer-run, companies will appropriately expand or contract capacity (perhaps even dropping a product entirely) based on products' financial attractiveness versus internal profitability 'hurdles', or relative to other products or other investment options.

Monopolies and Imperfect Markets

The conceptual opposites to perfect markets are ***monopolies*** – which are ***imperfect markets*** dominated by a single supplier.[4]

Monopolists face a downward sloping demand curve since, by definition, they are the industry. The major implication is that monopolists are able to constrain supplies and set prices based on their unique financial goals and cost structures.

In theory, monopolists maximize profitability by supplying quantities up to the point that their marginal revenue is equal to their marginal costs.[5]

Since a monopolist's prices are not established by "the market", but rather are set (or at least substantially influenced) by a single company (the monopolist) to optimize its economics, objections are frequently raised that the resulting price may be inefficient from a broad economic perspective (resources are not efficiently allocated) or "unfair" from a social viewpoint (i.e. prices are unnecessarily high).

Accordingly, monopolies are sometimes legally challenged (e.g. the Microsoft case) and often highly regulated (e.g. many utilities).

Between the Extremes

While many markets are intensely competitive – with several companies aggressively vying for customers and sales -- few markets pass the economists' tests as "perfectly competitive". Though some commodity markets may come close to passing the definitional criteria, most (i.e. virtually all) markets have imperfections that violate one or more of the perfect market conditions.

Said differently, *"No firm of any consequence in this country or, for that matter, the world meets the requirements for the absence of market power under the market structure that economists call perfect competition."* [6]

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[4] Between the extremes, closer to monopolies, are ***oligopolies*** with a relatively few substantial competitors.

[5] This "rule" assumes that the monopolist eventually faces diminishing returns and increasing marginal costs. In the "new" digital economy, this condition may not always hold.

[6] McKenzie, Richard, Trust on Trial, Perseus Publishing, 2000, page 19

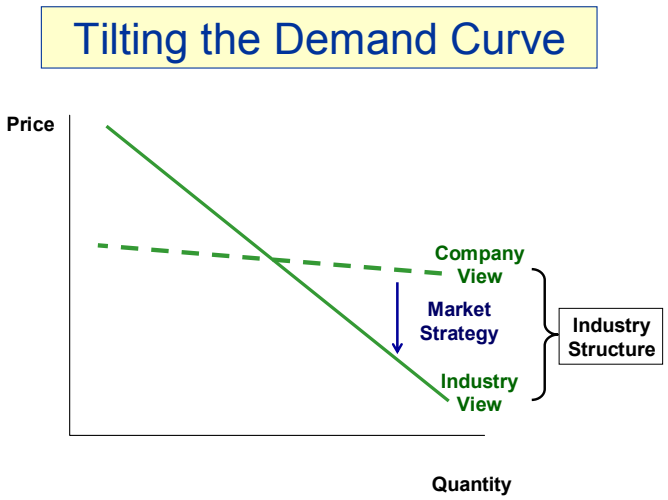
These market imperfections may be natural or, can be induced by effective strategies that, for example:

(a) Capitalize on a company's tight "fit" with specific customers (i.e. targeting markets to "own a segment")

(b) Build and leverage brand equity (i.e. getting more than "full" credit for benefits delivered)

(c) Lock customers into the company's offerings (e.g. quantity discounts, multi-year contracts, loyalty programs)

(d) Make direct product comparisons difficult (e.g. by substantially differentiating the offering from competitive products)



Market Structure Implications

Again, all competitors are simply price-takers in perfectly competitive markets. So, from a strategic marketing perspective, it is important to recognize that:

(a) Most markets are at least somewhat "imperfect"

(b) The degree of market imperfection can be, and usually is, strategically induced

(c) In imperfect markets, individual firms face downward sloping demand curves

(d) Downward sloping demand curves provide leeway in setting prices

(e) The more imperfect the market, the greater the available pricing leeway.

So, oversimplifying somewhat, the objective of most marketing strategy is to identify or induce marketing inefficiencies that "tilt the demand curve" downward so a company can leverage the economic-based benefits of a monopoly-like downward sloping demand curve.[7]

The implications of an imperfect market's downward sloping demand curve can be illustrated by a typical new product pricing decision: should a product be launched with an aggressively low price from the start (***penetration strategy***), or should the product be introduced at a high initial price with subsequent price reductions as the market matures (a ***skimming strategy***).

Again, if the product were being launched into a perfectly competitive market, there would be no pricing decision to make per se. The prevailing market price would be the price. So, the company's decision would be whether or not to launch the product.

But, a substantially new product is, in effect, an isolated or ***local monopoly***. That is, for at least some target market segments, the new product is initially unique with no substitutes. So, the innovating company has pricing leeway. The more the product is unique (i.e. differentiated) and strategically targeted to the most willing buyers, the greater the monopoly effect and the broader the pricing leeway.

[7] This strategic objective is generally stated more euphemistically as "developing strong market positions"

Penetration Strategy

From a strategic perspective, focusing on market share with a penetration strategy is most appropriate when it is important to exploit a potentially transient first mover advantage, or to quickly establish a broad installed base in anticipation of:

(a) Cost improvements from scale, scope or experience (learning curve)

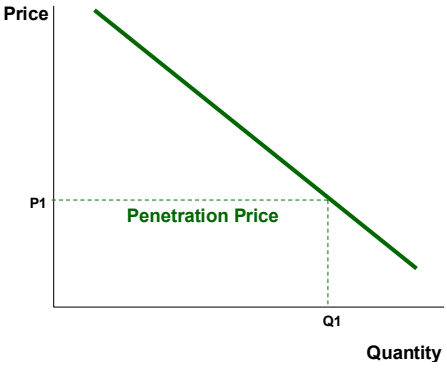
(b) Substantial complementary product sales (e.g. razors and blades, toner cartridges for printers and copiers)

(c) Subsequent upgrade cycles (e.g. software)

(d) ***Network effects*** that provide increasing benefits as more customers buy the product (e.g. fax machines) [8]

The conceptual essence of a penetration strategy is illustrated below.

Penetration Pricing



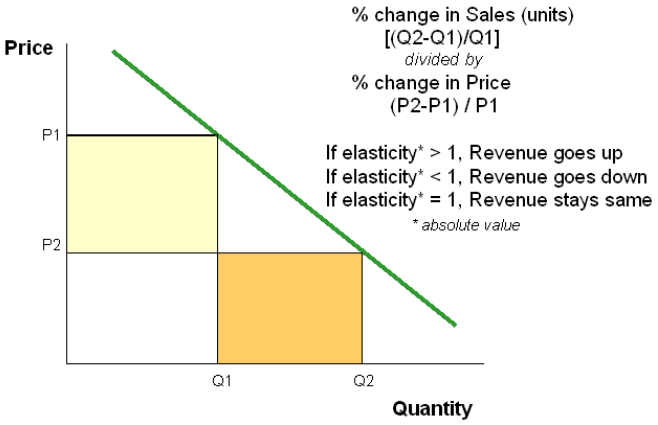
To quickly penetrate the market, the company launches the product at relatively low price (P1), expecting to sell quantity Q1, and generate revenues equal to P1 times Q1 (the area of the dash-lined box). The penetration strategy capitalizes on the downward sloping demand curve since the company can pick the price and, within some reasonable bounds, optimize the resulting short-run sales quantity.

The penetration price selected (P1 in this case) will typically be driven by two factors: ***price elasticity*** and ***marginal cost***.

[8] Another example: Microsoft's Windows operating system benefits from ***regenerative network effects***. With a large and prospectively growing installation base, applications developers are motivated to develop Windows-based software. As more applications become available, more customers are inclined to adopt the Windows operating system, and so on, and so on.

Price elasticity is a measure of the market's responsiveness to a price change. If the quantity demanded increases (in percentage terms) more than a price decreases (also in percentage terms), then revenue goes up and demand is said to be price elastic at that point. Conversely, if quantity increases less than price decreases, then revenue goes down and demand is inelastic. [9]

Price (Demand) Elasticity



In most instances, companies will only consider a lower price if revenue is projected to increase, i.e. demand is elastic with respect to price. But, since the ultimate objective is profitability, a revenue increase is necessary but not sufficient: profits may decrease even if revenues increase since unit margins (price less costs) decline, unless scale economies or experience effects are sufficiently large that costs per unit decline. So, the decision hinges on both price elasticity and marginal costs.

More specifically, the penetration price is usually set higher than the firm's marginal cost to bolster profitability. In some special cases, though, the penetration price may actually be lower than marginal cost. For example, a firm may be willing to incur initial losses (i.e. price below cost) if substantial future-related profitable sales are expected from complementary sales, upgrades, or price increases. [10]

[9] Elasticity can be a confusing concept because of multiple meanings and nuances. Sometimes, an entire demand curve will be characterized as inelastic (price changes induce no changes in quantity demanded) or elastic (small price changes result in near-infinite increases or zeroing of demand). More commonly, though, a demand curve will be elastic over some price range (typically the higher prices) and inelastic at other prices. The implication is that the elasticity of demand curves must be evaluated at specific price points.

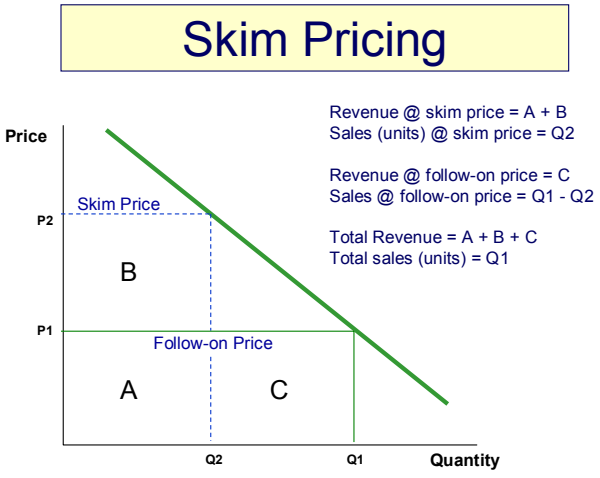
[10] Again, this futures-oriented dynamic partially explains why software companies willingly provide initial versions for free.

For example, HP tries to sell as many printers as it can, even at slim margins, and then make money from ink and other consumables. According to Fortune, "*Every second of every day, HP makes one new printer and ten new ink-jet cartridges. The company controls 60% of the ink-jet-printer market and 55% of the laser business. Last year, HP sold about $9 billion of ink and supplies, or nearly as much as it took in from printers. But while printers carry gross profit margins of 15% to 20%, the margins on ink are 50%. Indeed, ink accounts for most of the company's profits. Call it HP's black gold.*" [11]

Skimming Strategy

A skimming strategy is a radically different approach from penetration pricing. When skimming, a company initially sets a relatively high price (well above costs) that will be acceptable to only a portion of potential customers, namely those who value the product highly and have the means to buy it. After the "high end" market is saturated, the price is lowered to attract potential customers who value the product lower or have lesser means.

Conceptually (illustration below), the skim price (P2) generates initial sales of Q2, and revenues P2 times Q2 (the sum of squares A and B). When the price is subsequently reduced to P1, additional sales are generated equal to Q1 minus Q2 (since Q2 sales were made at the higher skim price). The second round revenues are depicted by box C. So, total revenue under the skim strategy is the sum of the boxes A + B + C.



[11] Fortune, "Open Season on Carly Fiorina", July 23, 2001

Assuming that P1 is equal to a penetration price alternative, skimming revenues in this case exceed initial penetration revenues by an amount represented graphically as box B.

A skim strategy clearly exploits the downward sloping demand curve by sequentially targeting different market segments to maximize initial revenues,[12] and is most appropriate when groups of customers value the product's benefits differently, when time is not of the essence (e.g. competition is not imminent), and when futures-related benefits from an installed base are minimal.

Price Floors & Ceilings

Skim and penetration pricing of new products are specific cases of strategic pricing leeway stemming from market imperfections and downward sloping demand curves.

In a broader context, pricing decisions (i.e. how much to charge for specific products) are typically "bracketed" between a ***price floor*** (the lowest price acceptable to the company) and a ***price ceiling*** (the highest price that "the market will bear" without jeopardizing a firm's competitive position).

More specifically, a ***price floor*** is the lowest price that achieves the firm's profit objectives. For so-called ***normal goods*** with no significant complementary or futures-related profit-generating sales to consider, the price floor is a function of appropriately determined, relevant ***product costs*** (see analytical note below) and the firm's ***profit objectives***[13]. A firm's profit objectives may be set on various metrics: percentage ***profit margins*** (ratio of profit to sales), total profit dollars, ***return on investment (ROI)***, etc. In general, ROI-based measures are most appropriate, though other measures may be adequate operational proxies.

Under perfect market conditions (many substitutes, highly fragmented, full information, rational decisions), the ***price ceiling*** is the equilibrium (or prevailing) market price, which is determined in the market by the industry's supply and demand characteristics.

In theory, no sales will materialize in a perfect market at prices set higher than the market price. So the market price is a ***hard price ceiling***.

[12] A similar line of logic provides the basis for ***price customization*** (a.k.a. ***price discrimination***) with simultaneous multiple prices in the market and ***price fences*** that separate market segments with differing willingness and ability to buy..

[13] When there are related profitable sales expected, a company may be willing to price below cost (i.e. incur a loss) provided that the complementary sales are sufficiently profitable.

Analytical Note

There are several characteristics of "cost" that should be considered:

***Total costs** can be split between **fixed costs** (relatively constant regardless of volume) and **variable costs** (which vary directionally with respect to volume[14]). While long-run decisions are set based on total costs (plus targeted profit), short-term pricing decisions are typically based on variable costs (or more precisely, **incremental costs** or **marginal costs**). A breakeven analysis determines the sales quantity that is required to cover all fixed costs. In most basic cases, a **breakeven point** is simply calculated by dividing the fixed costs by the profit margin (price minus variable cost).*

*Costs can be **static** (i.e. based on specific conditions at a specific point in time) or **dynamic** (varying over time and under changed conditions). Among the more critical dynamic cost factors to be considered are **inflation** (increased prices for factor inputs), **scale economics** (decreasing unit costs as periodic volume increases), and **experience effects** (systematic cost reductions accruing from the "**learning curve**" as volume accumulates over time).*

*Costs can be extracted directly from **standard cost** accounting systems (that are primarily intended for reporting and managing aggregated costs) or more precisely estimated by applying **activity-based costing** (a rigorous procedure that attempts to assign costs to individual products and customers based on specific **cost drivers** and usage rates)*

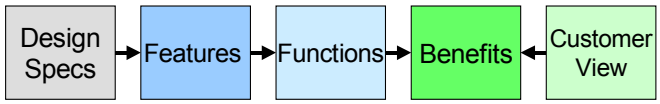
[14] Variable costs do not necessarily increase at a constant rate with volume. Variable costs per unit may decrease as volume increases due to experience effects (e.g. greater efficiency through specialization) or scale effects (e.g. able to run equipment at the most efficient rate or buy inputs in more economical lot sizes); or variable unit costs may increase (e.g. if premium overtime labor rates must be paid).

Relative Perceived Value

More generally, a price ceiling is a function of the ***relative perceived value*** that a customer receives from a product.

Relative perceived value is centered on three fundamental premises:

(1) Customers buy products not for their features (e.g. Pentium chip) or their specific functionalities (e.g. pc processor speed), but rather for the ***perceived benefits*** that the products deliver. A product's features and functions - which are often the focus of product design specifications - are simply the mechanisms that deliver the benefits that customers want.



Customer perceptions are ultimately what matters! A product may meet objective performance criteria (i.e. validated by internal laboratory tests), but a company only 'gets credit' if the customers recognize (i.e. "perceive") that the product delivers the benefits.

(2) Similarly, potential customers make purchase decisions considering a product's ***perceived price***. That is, how much a customer thinks that a product will cost them. These perceptions may or may not accurately reflect reality. In fact, surveys often reveal most people to be remarkably inaccurate when queried on the prices of common, frequently bought products.

And, though rational buyers should consider a product's ***fully-loaded lifetime cost***, some may be swayed by simpler measures like ***shelf price***, which may not be appropriately inclusive.

(3) ***Perceived value*** is a consolidated measure: either the difference between the ***perceived benefits*** that a product delivers and its ***perceived price***, or the ratio of the perceived benefits and the perceived price.

As a ratio, value translates to "***benefits per dollar***", a relatively standardized metric that enables comparison:

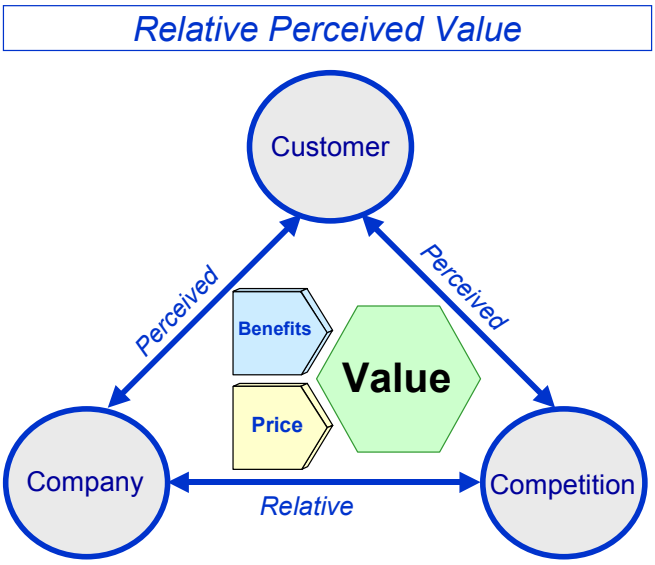
(a) Against a specific customer's requirements (e.g. not to pay more than a certain price)

(b) Across a set of reference products used explicitly or implicitly for perceptual benchmarking (e.g. this type of product should cost roughly this amount)

(c) Among substitutable products that may be directly or indirectly competitive. For example, Coke and Pepsi are directly competitive. Coke and bottled water are indirectly competitive (since both are beverages). Coke and potato chips compete very indirectly for "share of stomach".

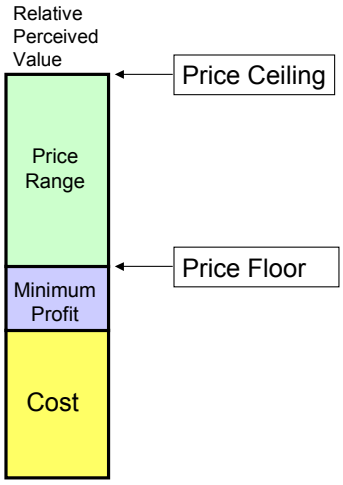
Put in the classic ***3Cs framework***, relative perceived value can be defined as:

> A standardized measure that matches benefits to price (***value***), as ***perceived*** by customers, ***relative*** to comparable competitive products and a customer's specific buying criteria.



Pricing Range

Again, ***relative perceived value*** sets the theoretical ***ceiling*** for pricing decisions, and costs (plus minimum acceptable profits) set the ***floor.***



The actual price selected, while confined to the range between the floor and the ceiling, is specific to a company's strategic objectives (e.g. skim or penetrate) and the competitive landscape, which may limit the viability and sustainability of prices substantially above the floor since competitors may undercut prices and still earn acceptable profits.

Finding the "sweet spot" between the floor and the ceiling is critically important because of the ***profit leverage*** from pricing. Given a typical company's cost structure, a price difference of 1% can often impact net income by 10 to 15%.

Cost-based Pricing

While some companies adhere to mechanical ***cost-based pricing*** rules (e.g. cost plus a constant margin), the most effective profit-maximizers set prices "to the market", with cost (plus minimum profit) merely serving as a minimum pricing threshold.

If market-based prices are below the price floor, a firm may price at the floor (and suffer the sales volume consequences) or may abandon the market (since the product loses money at the market price).

If a firm is able to reduce its product costs, the price floor is lowered, but the company is under no commercial, statutory, or ethical requirement to commensurately reduce its product prices! Doing so may increase sales, but the gain may be temporary and may be sub-optimal from a profit perspective.

Similarly, if a firm incurs a product cost increase, it may or may not be able to pass along the cost increase in its product prices, depending on competitive market prices. If competitors hold their product prices - either because they do not face the same product cost increases or because they are willing to accept lower profitability levels – then the firm must either absorb the cost increase (and lower profits), or give up some sales at increased price levels. The optimal approach is strictly situational, and analytically determinable.

Market-based pricing is the profit-maximizing rule. Nonetheless, some companies follow cost-based pricing procedures that may appear to be uncoupled from market prices. For example:

(a) Many retailers set item prices based on target margins. This retail practice, which is functionally equivalent to cost-plus pricing, is simply a matter of practical heuristics since it would be difficult operationally to set individual market prices for thousands of specific items.

Some state-of-the-art retailers electronically input competitive prices that can be used to calibrate market prices via computer-based systems.

(b) Some large construction projects (e.g. ships, roads, buildings) are priced on a cost-plus basis. Using a so-called "percentage of completion" method, as portions of the projects are completed, an agreed-to profit margin is added-on to the appropriately determined costs.

For complex projects, the rationale for cost-plus pricing is that there is too much uncertainty at the onset of the project to determine an appropriate final price.

(c) Many government contracts are priced on a cost-plus basis. These traditional procedures were probably devised to contain profits at generally accepted "fair" levels that protect the government from apparent price gouging.

Cost-plus Pricing: Disadvantages

Cost-plus pricing schemes have two major disadvantages:

(1) There may be a diminished incentive to control costs since total dollar profits increase as costs rise. So buyers may actually end up paying inflated prices.

(2) From the firm's perspective, money may be "left on the table" since customers may actually value the product highly and might have paid more for it.

So on balance, while cost-based pricing systems may be operationally efficient, they are unlikely to be financially optimal (i.e. from a profitability perspective).

And eventually, even cost-based approaches are subject to market forces. For example, if internally focused, cost-based prices are non-competitive (i.e. too high), a company will be forced to adjust its mark-up factors or suffer lost sales.

Market-based Pricing

For market-based pricers, the pivotal question is: how does the market value a product?

The answer is contextual (i.e. it depends on the specific product category and set of reference products} and is conceptually-based.

At its core, "market value" is a fundamentally straightforward - though hardly simple - economic notion.

Economic Value to Customers

In some product categories, value can be expressed as monetized costs and benefits, and calibrated in purely economic terms. The underlying concept is ***economic value to the customer (EVC)***.[15] In essence, rational buyers add up the anticipated benefits, relate them to the associated costs, and buy the product if it offers enough benefits to justify the price (***absolute EVC***), and the most favorable economics relative to other spending options (***relative EVC***).

To illustrate EVC, consider an industrial product like a machine that is required for production and has already satisfied finance-based investment criteria (i.e. absolute EVC is satisfactory).

[15] EVC is also referred to as ***value in use*** and ***end-benefit value.***

Assume that the supplier's cost to make the machine is $100,000, that the current fair market price is $125,000, and that the buyer incurs $75,000 of operating costs over the life of the machine (say, 3 years).

Further assume that the supplier redesigns the machine, and that the replacement machine is functionally equivalent (i.e. performs essentially the same tasks as the original machine), that the redesigned machine can be made at a lower cost ($90,000), that the product life stays the same, and that customers incur $50,000 in operating costs over the life of the redesigned machine (a $25,000 cost savings).

Economic Value to Customer

- Current product
  - Mfg. Costs $100,000
  - Selling/purchase price $125,000
  - Cust. lifetime op costs $75,000
- New product
  - Mfg. Costs $90,000
  - Selling/purchase price ??????
  - Cust. lifetime op costs $50,000

How should the new machine be priced? Start by asking: what is the price ceiling, or highest price that the product might command in the market

A customer is likely to have one or more ***reference prices*** in mind, such as their subjective "fair" price for this and similar products, the price they last paid, and, most important, the price of competitive products.

From the customer's perspective, the original product provides a clear point of reference. It had a total lifetime cost of $200,000 (the $125,000 purchase price plus the $75,000 lifetime operating costs).

Ignoring any time value of money, rational customers should be indifferent if their total lifetime costs stay the same. Since the redesigned product's operating costs are $25,000 lower ($75,000 less $50,000), customers might be willing to pay at most $150,000 for the new machine ($150,000 purchase price plus $50,000 operating costs equals the original $200,000 total lifetime costs).

Of course, in order to establish the high price, the company (i.e. marketing) must convince the customer that product performance has not been compromised, and that the operating cost savings will actually materialize. The company might substantiate the savings with objective data (e.g. from engineering or clinical tests) or have high credibility endorsers (such as technical or industry experts) provide testimonials. To minimize the customer's risk, the company might even offer performance-based guarantees that offer a refund if the savings are not attained.

At this high price ($150,000), the company should be able to maintain its market share (since the customer's lifetime cost remains the same), and would increase its profits by $35,000 (the $10,000 manufacturing cost improvement plus the $25,000 price increase).

In other words, $35,000 of value has been created and the company has captured (or "retained") all of it. Customers are no better or no worse off than they were before.

What is the lowest price that the company might consider?

The original product yielded a profit of $25,000 per machine (the selling price of $125,000 less the manufacturing cost of $100,000), or in percentage terms, 20% (the $25,000 profit divided by the $125,000 selling price).

The product could be priced at $115,000 and still preserve the dollar profits per machine ($90,000 manufacturing cost plus a $25,000 profit), or it could be priced at $112,500 to preserve the 20% profit margin ($112,500 less 20% equals the new manufacturing cost of $90,000).

So the rough-cut price floor is $112,500 to $115,000.

At the low price of $112,500, the company is likely to gain market share, at least in the short-run, until competitors react.[16] At this lowest price, the company maintains its percentage margins, but dollar profits per machine actually decline $2,500 (from $25,000 to $22,500). Lifetime costs to the customer decline by $37,500 (a purchase price savings of $12,500 plus the $25,000 in operating cost savings). Again, $35,000 of value has been created with the new product.

At $112,500, more than 100% of the created value is ceded to the customer and the company captures none of the added value. A price of $115,000 would preserve the company's profit per machine and cede precisely 100% of the created value to customers.

[16] To be technically precise, a price lower than $112,500 might maximize short-run profits if additional sales volume is generated. But, longer-run, competitors will typically respond with lowered pricing and/or modified products. So, the $112,500 price floor is a reasonable long-run planning approximation.

So why might a value advantaged company adopt this pricing strategy? Again, the product should accrue share gains. If competitors are willing and able to respond, the gains may be transitory. But, if the company has a competitive cost advantage with the new product, competitors may be unable to respond and the gains may be more long lasting. Or, if the product accrues meaningful first-mover advantages (say, building a large, leveragable installed base), the lower price may be critical to establishing a market position.

Most often, a company will elect to price somewhere between the price floor and the price ceiling. Doing so captures some of the value created as increased profits, and cedes a portion to customers, improving the product's competitive position.

For example, the current market price ($125,000) is between the floor ($112,500 to $115,000) and the ceiling ($150,000).

By pricing the product at $125,000, the company would cede $25,000 of created value to customers (the lifetime operating cost savings) and would retain $10,000 of added profits (the lower manufacturing costs).

And, at the prevailing market price, the company has a less challenging sales proposition for customers: the full $25,000 in operating savings does not need to be proven to justify the price.

So, the answer to the 'what price' question is 'it depends'.

If the company is satisfied with its current market share, and is confident that the operating cost savings are real and can be credibly communicated to customers, then a price close to the price ceiling is appropriate.

If the company believes that the manufacturing cost savings provide a sustainable competitive advantage, or that meaningful strategic benefits could accrue from a short-term share gain, then a price closer to the price floor might be appropriate.

Most often though, a company is likely to price between the price floor and the price ceiling, retaining some of the created value and ceding some portion to customers. In doing so, the company hedges its bets, eases the selling challenge, and provides some 'wiggle room' to cut prices in the future.

Value – More Broadly Defined

When all costs and benefits can be monetized, and buyers are economically rational - as in the preceding illustration - a pricing analysis is conceptually straightforward.

More typically, though, firms make pricing decisions in a context where the economic value of a product's benefits is more implicit than explicit, or where economic value may be enhanced or diminished by non-economic factors (tangible or intangible).

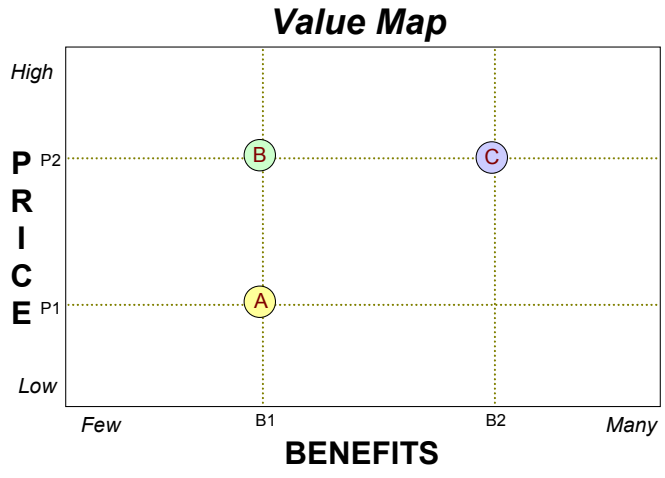
That is, buyers make decisions by weighing a multitude of factors that are important to them. Their decision may be a composite of both economic and non-economic factors that can be either objective or subjective.

In this more general case, the starting point for a pricing decision is a calibration of the implied worth of a product's delivered benefits that is matched against the product's price, and compared to competitive products.

An analytical technique for framing the price-benefits relationship is called Value Mapping.[17]

Value Maps

In essence, a Value Map relates the aggregate perceived benefits (on the horizontal axis) delivered by a set of comparable products (the circled letters) against their respective prices (on the vertical axis).



[17] Various sources have presented similar concepts to the Value Maps that will be described. The earliest versions that the author is aware of trace back to McKinsey strategic analyses used in the late 1970s.

The more benefits that a product is perceived to deliver, the further to the right it appears on the value map. For example, product C (above) delivers more benefits than product B (B2 is greater than B1); and product B delivers the same level of benefits as product A (B1).

Similarly, the higher a product's price, the higher it appears on the map. For example, product B is higher priced than product A (P2 is greater than P1), and is equally priced with product C (P2).

Even in this simple hypothetical illustration, some logical inferences can be drawn with respect to the value delivered by the products. Product A delivers more value than product B (same benefits at a lower price).

Similarly, product C delivers more value than product B (more benefits at the same price). In other words, Product B is in an unequivocally disadvantaged value position.

But, the relative value of products A and C is less obvious. Product C delivers more benefits, but it has a higher price. So which offers greater value?

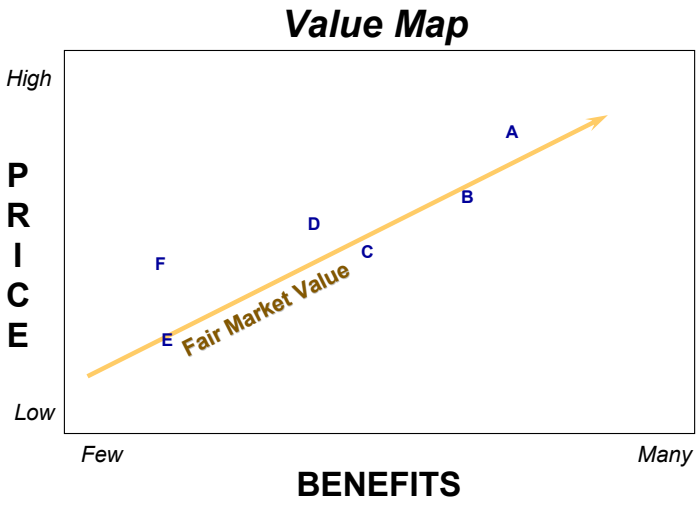
A more relevant and appropriate question is whether A or C or both offer value that is considered "fair" by potential customers.

For example, product A may be a "stripped down" model that is priced just right for economy-oriented buyers and C may be a "step up" model that is suited for performance-oriented customers.

In theory, customers have, at least implicitly if not explicitly, a relationship in mind that balances products' benefits with their prices.

For a given set of known product offerings, at specific points in time, customers are likely to internalize a perspective as to what constitutes a fair value.

This relationship can be conceptualized as a ***fair market value line*** [18] -- based on an evaluation of competitive offerings -- with each point on the line representing a specific combination of benefits and price that is considered a fair value by the market.

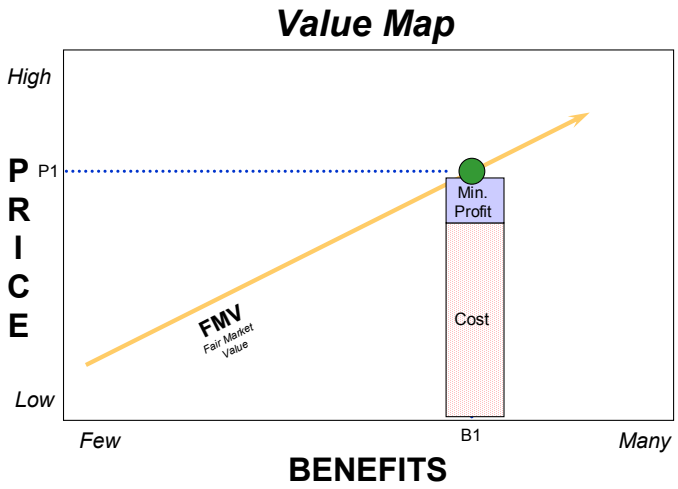


(Note that the FMV line is not simply a least squares fit of the observations. Rather, it is defined by the products apparently offering "best value". Further, FMV is not necessarily a continuous straight line.)

Value Map Implications

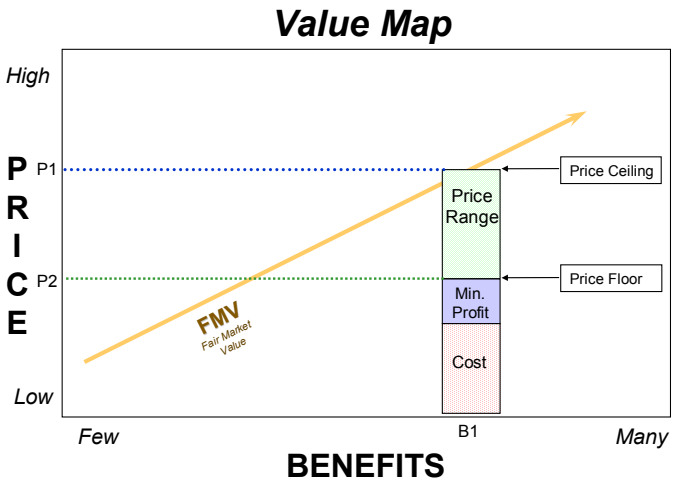
The important nuances and dynamics of the value map can be illustrated with a hypothetical new product introduction.

Assume that a company currently has a product in the market that offers a level of benefits B1 and is priced at P1. The product is on the fair value line, has a stable market share position, and just meets the company's minimum acceptable profit level.

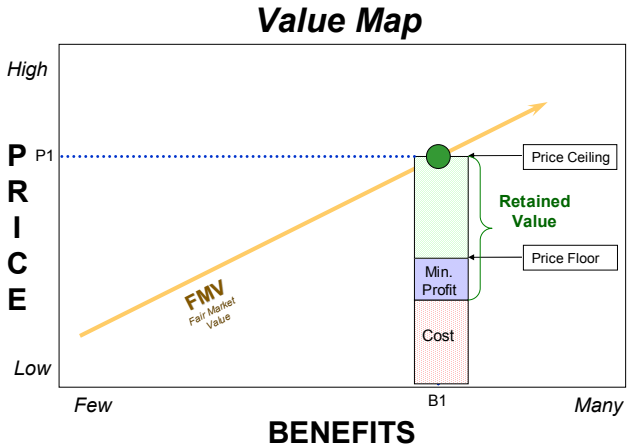


[18] The fair market value line is sometimes referred to as a "value equivalence line", and is sometimes represented as a "value indifference zone" - an area between parallel lines that "bound" a range of perceptually equivalent values.

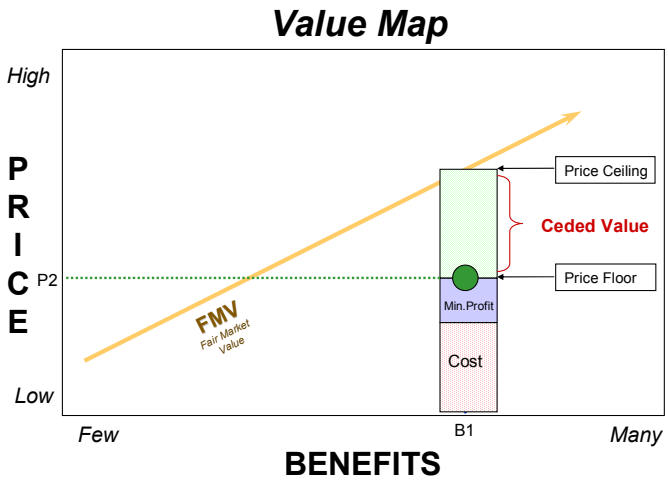
Further assume that the company has a redesigned product that offers the same level of benefits (B1) and has lower manufacturing costs. The company has a minimum profit target for the product, so the relevant price range for the new product is from P1 (the old product's price – a "fair" price for B1 of benefits) and P2 (the price that just meets the company's profit objectives). The price range is the direct result of the cost reduction which has "created" value.



If the new product is priced at P1, market share should remain the same (since the product is on the fair value line), and profits should increase (since product costs are lower). Said differently, the product is being priced at the ceiling, and all value that has been created is being retained as profits.



What if the company were to introduce the product at price P2? Assume that P2 is the "floor" price that enables the company to maintain the old product's profitability rates, and pass along the new product's cost savings to customers.

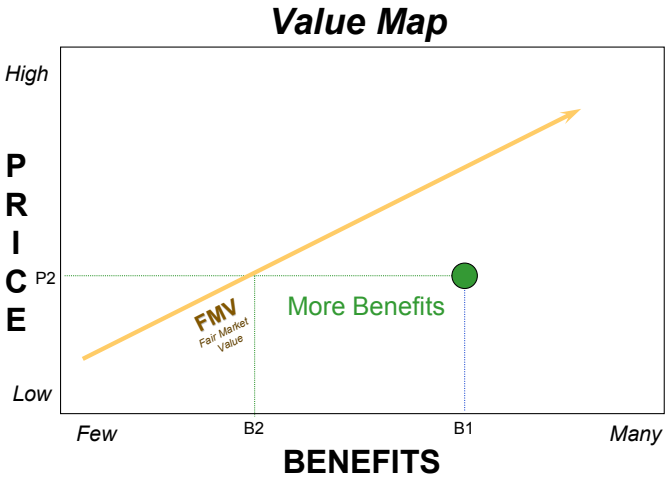


In essence, the product is being priced at the floor, and all value that has been created (over the product's cost) is being ceded to customers.

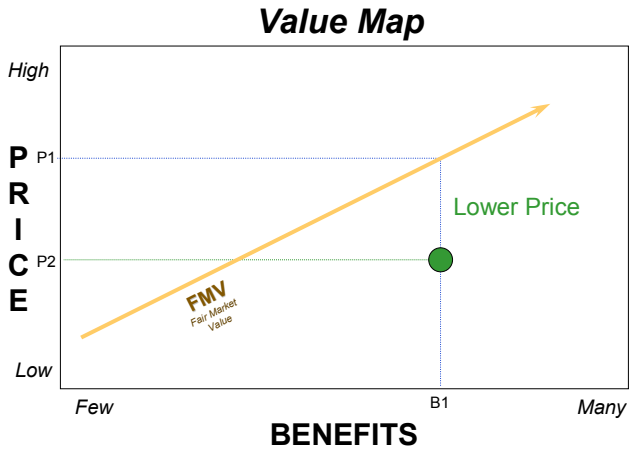
What is likely to happen in the market short and long-run?

At price P2, the new product exceeds the market's value expectations. The additional value is evident from two perspectives.

First, the product offers more benefits (B1 versus B2) than the market expects at price P2.



Similarly, the product offers a level of benefits (B1) at a lower price than the market expects (P2 versus P1).

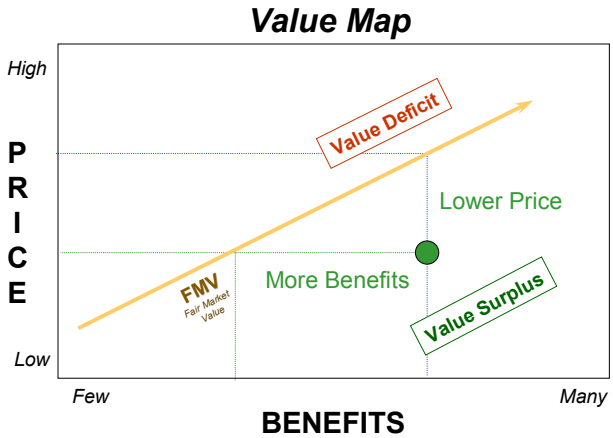


From either perspective, the new product is now unequivocally advantaged with respect to value delivered in the marketplace.

Since it offers more benefits for the price (or a lower price for the same level of benefits), the new product has created a ***value surplus*** that, at this price (P2), is ceded to the customer.

Keep in mind that the company could have priced the product at P1 and it would have been considered a fair value in the market.

All products in a comparable position (below the fair value line) are in an advantaged value surplus position.

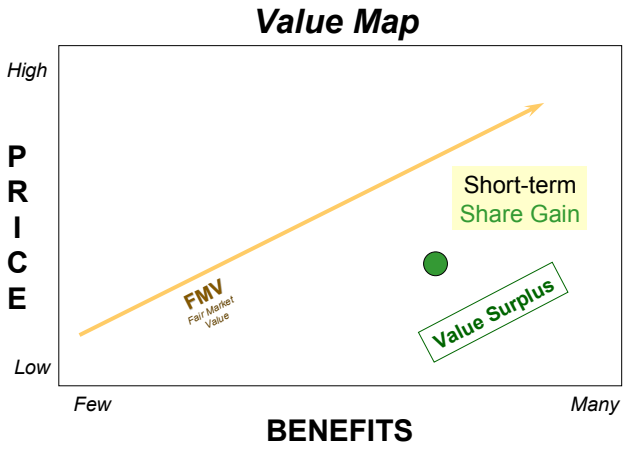


Conversely, products above the value line are in a disadvantaged ***value deficit*** (or "value shortfall") position. That is, they offer less value than the market collectively expects. Accordingly, they are in very unstable positions and likely to lose share to higher value products.

Value Map Dynamics

So, what are the market dynamics when a product is introduced to the market with a value surplus that is ceded to the customer?

Initially, the product can be expected to gain market share versus competitive products (or legacy models) since it does offer an unequivocally better value.



The extent of the share gain depends on the ***price sensitivity*** that customers have towards the product (i.e., how important price is in their purchase decisions). Gains are most likely for price-sensitive products such as easy to compare commodities that are used frequently and represent a large portion of the buyer's budget.

Significant gains are <u>least</u> likely when

(a) Products or prices are tough to compare (e.g. cell phone plans with different monthly fees, time variable usage rates, surcharges, and small print restrictions)

(b) The full cost isn't borne by the buyer (i.e. charged back to companies or insurers)

(c) The product represents a small part of the buyer's costs or budget

(d) Customers are formally or informally locked in to their current brands (e.g. high comfort factor, low risk tolerance, routinized procedures, financial or operational "tie ins" with complementary products, or incentive buying programs such as quantity discounts or loyalty programs).

But, any share gains may just be short-lived.

Competitors positioned on the current value line are confronted with a fundamental decision: do they allow the new product to take market share or do they respond with a more competitive product offering (pricing or product changes) that protects their market position.

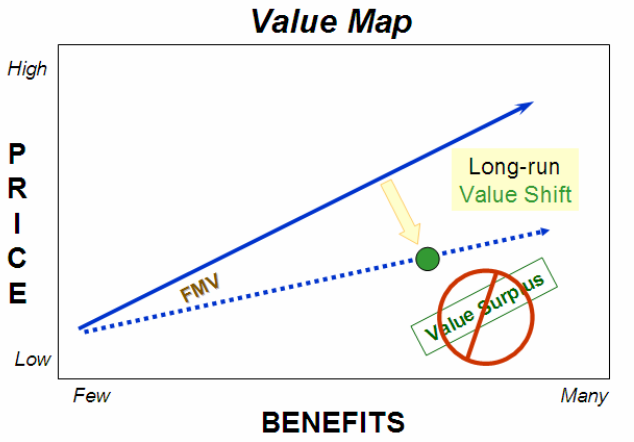
If a competitor concludes that they are at a competitive cost disadvantage and a lower price would cut profit to an unacceptable level, they might ignore the new product and accept the volume consequences (lower share).

In the very short-run, competitors are most likely to rebalance the value relationship with lower prices or focused advertising that accentuates their products' benefits.

Longer-run, they may redesign their products to offer more (or different) benefits, or to reduce costs, enabling a lower, profitable price.

Either way, the market's value curve becomes recalibrated with customers expecting more benefits for the dollar than they were previously able to get.

Conceptually, the fair value line rotates clockwise, reflecting the market's new expectations and eliminating any value surplus.



Example: PC Industry

Pricing in the PC industry offers a generalizable example of value line dynamics.

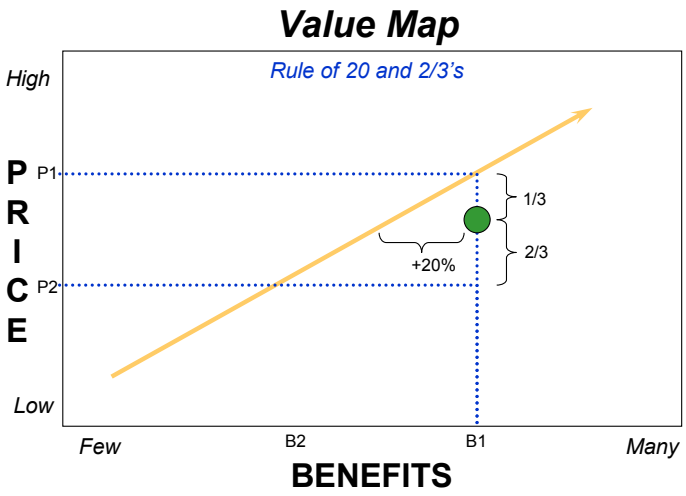
On an on-going and frequent basis, PC manufacturers introduce more, and more powerful features that translate to increased customer benefits. But, the market broadly constrains them to segmented price points (e.g. $999. $1999, $2499). So, manufacturers typically hold prices relatively constant while adding to features and reducing costs. Conceptually, the PC value line is constantly rotating clockwise.

The Strategic Pricing Decision

Given the above value map dynamics, the pivotal question is where between the ceiling and the floor should the price be set?

In general, the answer depends on the company's strategy for the product. If there is a compelling rationale for gaining share, and if the company is the low cost producer, then a price closer to the floor may be appropriate.

If share gains are not strategically critical, or the company is cost disadvantaged, then pricing may be closer to the ceiling to maximize profit margins.



As a rule of thumb, a product that delivers a perceptible increase in benefits (say, greater than 20% increase in benefits), and is priced to split the value created 1/3 to the customer and 2/3's to the company, may provide the best of all worlds since:

(a) The product will be well positioned against reference products

(b) The product's market value is enhanced

(c) Short-term profits (per unit) are increased

(d) The company has "wiggle room" to cut prices (and still stay above the price floor), recognizing the ***ratchet effect*** (easier to reduce than increase prices) and the likelihood of competitive responses.

Price Wars

The ***value calibration*** dynamics summarized above also characterize what happens in price wars.

When prices are lowered without a meaningful change in delivered benefits or product cost (e.g. air fares), the net effect is simply to raise value expectations in the market (same benefits at lower price equals more value).

If the price cutter is the low cost producer and cost disadvantaged competitors hold prices, the price-cutter will typically gain share. If all competitors respond, though, then the fair value line value rotates downward, market shares will be unchanged, and profit margins will erode. Total profits are likely to drop unless the lower prices increase sales by expanding the market.

Empirical estimates by McKinsey consultants[19] indicate that a price decline of only 1%, can lower operating earnings more than 20% (and 8% on average), unless volume is commensurately increased.

Analytical Note

To assess the magnitude of risk in a price reduction, calculate a base case level of sales volume and profitability at the current (high) price. Then, determine how much share must be gained at the reduced price in order to maintain profits (in total dollars) at the base case level, keeping in mind that fixed costs remain constant (as long as capacity is available), and contribution margins (price minus variable costs) will decline unless there are significant scale or experience effects.

Finally, assess the probability of achieving the required share gain, i.e. anticipate likely competitive responses.

For price increases, simply reverse the logic: calculate the upside profit potential if volume levels are maintained, and the market share loss that can absorbed without eroding profits (versus the base case).

[19] Reported in Fortune, May 14, 2001, p.240

Value Function

The value map provides a powerful conceptual framework for pricing decisions. To make the concept operational, it must be empirically specified (i.e. defined on a more analytically precise basis for a specific product and market).

A "model" that operationalizes the value function more precisely is, for example, the pricing protocol used by online PC companies (like Dell). A customer is presented with a base model (chip speed, "must have" features) and a priced menu of upgrades and optional features (e.g. bigger hard drive, faster communication interfaces). In essence, customers are compiling a unique product that specifically matches their value function: they only select features that they think add value (to them).

The conceptual extrapolation of the PC pricing model is the ***value function*** - an algebraic form of the value map.[20]

$$V = \sum_{i=1}^{n} (a_i * b_i) / P$$

V is the objective criteria: the perceived value of the product (benefits per dollar).

i represents a product's specific attributes (features, or more precisely, benefits like power or speed).

n is the number of significant attributes.

$\mathbf{a_i}$ is the relative importance weight of specific attributes (i.e. important or unimportant, expressed as a portion of the 100% total weighting across all attributes)

$\mathbf{b_i}$ is a measure of the extent to which a product meets the desired specification for an attribute (e.g. in perceptual mapping terms, proximity to an ideal point -- the closer, the better).

$\sum$ indicates a summation across all of the relevant attributes.

P is the price of the product, which standardizes the value measure as a ratio of total weighted benefits per dollar.

[20] This particular form of the value function is called a ***linear compensatory model*** since high values for some attributes can compensate for low values on other attributes. Other common models are ***conjunctive models*** (minimum qualifying criteria must be met for all attributes), ***lexicographic models*** (best performance on the most important attribute).

Analytical note

Various market research techniques (e.g. semantic scaling, conjoint measurement) – can be applied to estimate the value function variables.

With some analytical finesse, the results of the market research can provide rough estimates of the value function variables from which perceptual maps can be derived.

Value Function: Strategic Insights

From a strategic perspective, the value function can offer broad and deep insight.

Specifically, the value function highlights the marketing actions that can be taken to enhance value, such as:

(a) **Introduce an attribute ("i") missing from the product**

Example:
Competitive pc models already incorporate wireless communications

(b) **Introduce a new attribute (increase "n") with favorable cost / price leverage.**[21]

Example:
Introduce the first touch screen.

(c) **Communicate to customers that a product is closer to an attribute ideal than they perceive (modify the "b")**

Examples:
Publicize superior ratings from expert references like pc magazines; leverage brand equity to support claims.

(d) **Change the product to more closely align with the attribute ideals (b)**

Example:
Upsize the hard drive.

(e) **Communicate to customers that an attribute should be perceived as more important (modify the "a")**

Example:
"Alloy metal case for increased durability"

(f) **Target customer segments that heavily weight the importance of attributes that the product has (*benefit segmentation along the "a" variable*)**

Example:
"Light weight is perfect for the business traveler"

(g) **Change the product's price (P) to recalibrate the value delivered**

Examples:
Cut list price; introduce special promotional discounts; unbundle pricing (e.g. charge separately for shipping & handling); change terms & conditions (e.g. fee waivers, low cost financing).

(h) **Redesign the product to hit "target costs" by eliminating features that add costs but relatively little value.**[22]

Example:
Since the introduction of memory sticks, floppy disk drives add cost to a PC, but relatively little unique value.

[21] When an attribute costs relatively little but substantially increases perceived benefits, then price may be increased by more than the added costs. The effect is called ***cost / price leverage***.

[22] More broadly, target costing is a technique that works backwards from targeted price points and required profits to determine the maximum costs that can be "built into" a product. Then, features / benefits are adjusted to fit the cost envelope. See HomaNote – Product Fundamentals for more details.

Value Function: Strategic Implications

Several strategic principles can be drawn directly from the value function:

(1) A product must be at least at parity on all heavily weighted attributes to be competitive.

(2) A product that beats competitive products on a heavily weighted attribute is well positioned to win.

(3) In general, there is little leverage from low weighted variables.

(4) But, if all products are at parity on heavily weighted attributes, winning is dependent on performance on a lesser weighted but differentiating attribute.

(5) The "best case" strategically is often to introduce a new (proprietary) attribute and drive its importance weighting up.

(6) Cost reduction an on-going necessity, required to protect margins as products mature.

(7) Price reductions, while often an apparently expeditious action, should be considered as a last resort after other more sustainable value-enhancing moves.

Value Capture – Price Realization

Creating value is only part of the marketing mission. Converting the value created into profitability is the end game.

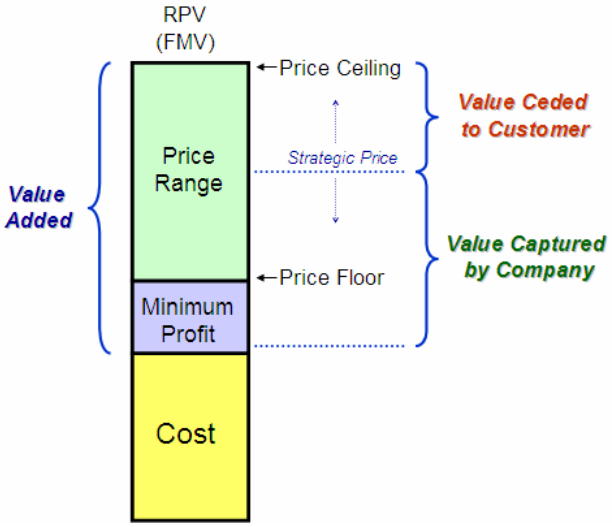
Again, value is created by delivering products that map against customer requirements, and framing customers' perceptions so that they understand the benefits and are willing to pay for them.

From a strategic perspective, the critical pricing decision is how to split the value added (the difference between the price customers are willing and able to pay, and the company's cost) between the company and the customer.

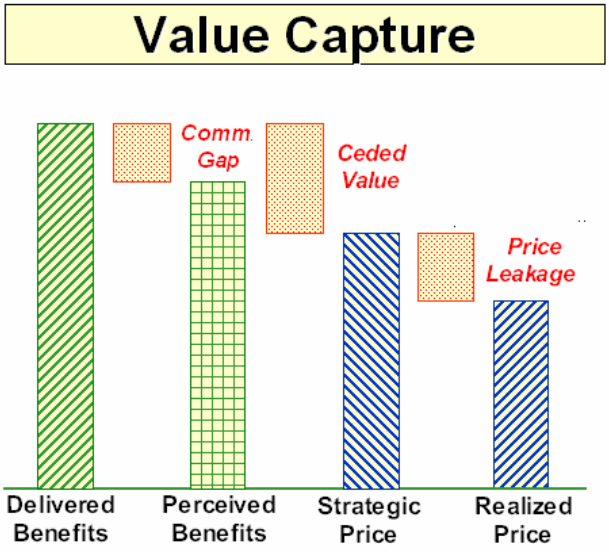
If the company charges customers the full price that they are willing to pay, the company has retained all of the value added.

If the company charges a price that merely covers its costs and a minimum acceptable profit, it cedes the added value to the customer and creates, for the customer, a value surplus. That is, the customer gets a better deal than they would expect given the competitive marketspace at that point in time.

Most often, depending on specific demand and cost drivers, companies will strike a price that cedes some of the added value, and retains some for higher profits.

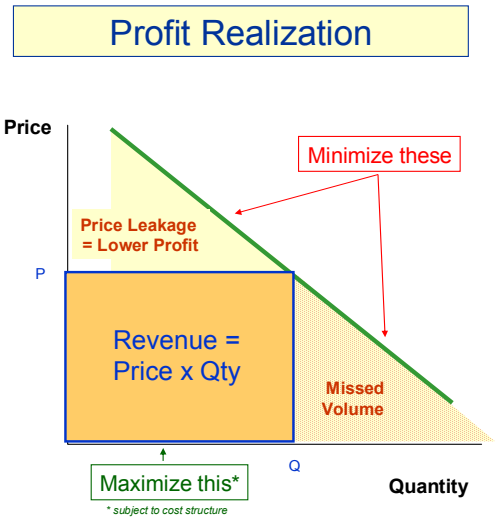


The tactical challenge is how to realize the full strategic price and transform it to higher profits. That is, how to minimize ***price leakage*** (or viewed conversely, how to maximize the transactions yield – the ratio of the realized price to the strategic price).



Price leakage can be intentional or inadvertent, and can be transactional or strategic. ***Transactional leakage*** can result from broad based programs that have the effect of reducing price realization, e.g. quantity and cash payment discounts, promotional allowances. Or, transactional price leakage can result from concessions made to individual customers – usually large volume purchasers – to induce timely or quantity-stretching commitments.

Strategic leakage follows directly from the logic of downward sloping demand curves.



Assume a product is offered at a single price (P) for all customers. The revenue generated would be P times Q – the shaded square. The single price strategy results in two pricing penalties. Some sales are missed because the single price is higher than some potential customers are willing or able to pay. If P is higher than the company's marginal cost, then some of the missed volume is lost profits. The second penalty is that some customers – those on the upper part of the demand curve, to the left of the single price - would be willing to pay more for the product. These customers receive a value surplus (since price is less than they are willing and able to pay); the company, in effect, leaves money on the table.

In theory, the way to minimize these penalties is to "map to the demand" curve and charge customers exactly what they're willing to pay (assuming it's more than cost). In real life, this general approach is used in face-to-face negotiations (e.g. haggling for a car), and in auctions (both "in person" and online). More generally, the approach is approximated through the process of price customization.

Price Customization

Importantly, "value" is characteristically ***product-specific*** (varies from market to market), ***idiosyncratic*** (varies customer to customer, and segment to segment), ***contextual*** (varies by purchase or usage situation), and ***dynamic*** (varies over time).

Said differently, customers often cluster in ***value segments*** that may ascribe different levels of relative perceived value to products based on their specific usage or buying patterns. That is, some customers are willing to pay more than others for essentially the same product. And, most customers are willing to pay different prices depending on when and where they purchase a product.

Profit-maximizers capitalize on these characteristics via ***price customization***. [23] That is, by offering different prices:

(a) By product or product variation (e.g. large sized packages are often discounted, "commercial" products are usually higher priced than consumer products)

(b) By customer or market segment (e.g. business travelers typically pay more than discretionary leisure travelers).

(c) By buying or usage situation (e.g. soft drinks cost more from vending machines and at ball games than from the supermarket)

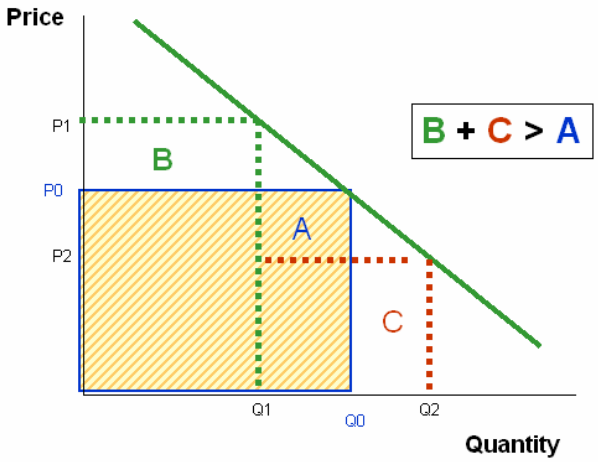
(d) By time of purchase (e.g. pre-season or "early bird" prices are lower than prime time, peak season prices).

In effect, price customization is a discrete (meaning "not continuous") mapping to the demand curve that reduces (but doesn't eliminate) the price leakage and missed volume penalties.

[23] Price customization is sometimes referred to as tailored pricing, price differentiation, or – classicallly –as price discrimination.

As illustrated below, a single price strategy generates revenue equal to the shaded square. Assuming that customers willing to pay higher prices can be isolated from those only willing to pay lower prices, then a 2-price strategy with a higher price (P1) and a lower price (P2), would generate more revenue (illustrated below since box B + box C is greater than box A). If additional price points were added to the mix, even more revenue would be generated since there would be an even closer mapping to the demand curve.

Price Customization



There are of course, important caveats to this price customization logic:

(a) There must be some degree of market inefficiency for the company to capitalize on the benefits of a downward sloping demand curve.

(b) There must be differing value segments in the market (i.e. groups of customers who value the product differently and are willing to pay different prices), and these segments must be kept separated by pricing "fences" (i.e. customers willing to pay high prices don't have access to the lower prices).

(c) Cost structures must be such that maximizing revenues is directionally equivalent to maximizing profits (e.g. when fixed costs dominate the cost structure)

Since pricing decisions "at the margin" are a critical driver of superior profitability, some companies (and whole industries) have taken price customization to high levels.

For example, ***yield management*** (differentiated pricing by customer segment and time of purchase) has become a strategic mainstay of the airlines industry. Facing a disproportionately fixed cost structure, airlines attempt to maximize total revenues per flight by offering a broad range of prices with differing qualification criteria. In essence, the airlines try to get top dollar from price insensitive customers (e.g. most business travelers) and fill "left over" seats with bargain hunters.

More broadly, the Internet provides a technology infrastructure for frequently updating prices, and tailoring them to individual customer's price sensitivity. For example:

(a) eBay enables auction pricing among peers

(b) Priceline allows customers to submit bids (which are accepted if they are above Priceline's "pocket price")

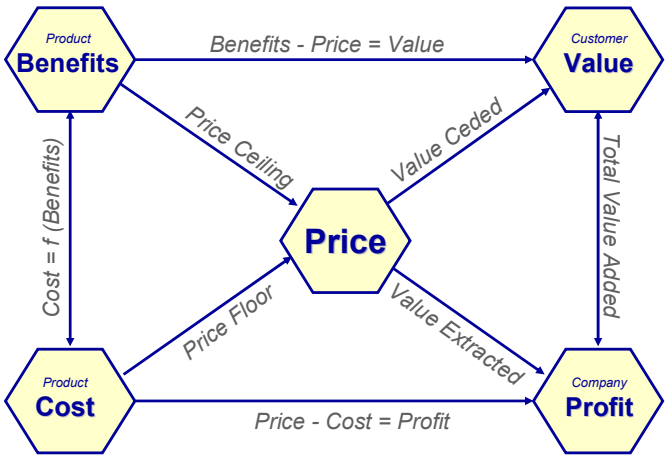
(c) Some online companies offer different prices depending on "click through patterns" (e.g. customers originating from a price comparison site may be offered a low price)

(d) Some online companies evaluate customer purchase histories to determine if price discounts are needed to "close a deal"

While some of the techniques raise obvious ethical questions, the general principle underlying price customization is sound: <u>maximize profitability by precisely matching prices with the perceived value that customers get from a product</u>.

Pulling It Together

The framework below consolidates the major pricing considerations.



(a) The benefits a product delivers largely determine a products price ceiling, since value is the relationship between benefits and price.

Sophisticated market research techniques can identify the required benefits. EVC and value mapping are analytical tools for calibrating value delivered.

(b) A product's costs are typically a function of the benefits specified into the product.

Conjoint measurement can provide an estimate of the "part worth" of various product attributes, and target costing can be used to force fit market prices and allowable costs.

(c) A product's cost, plus an acceptable profit margin, sets the price floor – the lowest price a company should charge (barring extraordinary strategic advantages from selling below cost).

(d) The total value added (the difference between a company's cost and prevailing market price), is split between value retained by the company (and dropped down to the bottom line as profit), and value ceded to customers (which generates a value surplus and "good deal" for customers).

(e) The greater the value surplus, the higher demand is likely to be (given the implications of the downward sloping demand curve).

Final Thoughts

While some companies still set prices on a passive, reactive basis (e.g. maintaining a constant ratio to costs or competitors' prices), effective profit-maximizers proactively set and change highly differentiated prices frequently to squeeze out higher profits.

In summary, these profit-maximizers:

(a) Are respectful of costs, but price to the market

(b) Focus on relative perceived value: customer by customer, situation to situation, and over time.

(c) Evaluate pricing options in an externally-oriented competitive context.

(d) Create real value and are eager to retain some portion of it as profits.

(e) Are constantly mindful of the profit leverage from pricing decisions made "at the margin".

(f) Rigorously track price yields and margins.

* * *

Again, price is a pivotal "P" in the marketing mix since it pegs value in the marketplace and bounds company profitability.

Appendix A – Creating a Rough-cut Value Map

Simple semantic scaling surveys often ask respondents to specify ratings that can be aligned with the value function variables:

$$V = \sum_{i=1}^{n} (a_i * b_i) / P$$

(**a**) How important are certain pre-determined attributes in your purchase decisions?

(**b**) What is the ideal level of an attribute (e.g. how sweet or how powerful)?

To what extent do specific products or brands meet your ideal criteria?

(**P**) How much would you expect to pay for each product / brand?

By taking some reasonable statistical liberties with the data, this type of survey can be the basis for developing a very rough-cut value map. That is, when all non-price attributes are consolidated into a single measure on the horizontal axis of a ***perceptual map*** and price is plotted along the vertical axis, the representation is a value map from which a fair value line may be inferred.

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1. For example, consider a product / market with 5 brands (A, B, C, D, E) and 4 significant product attributes (1, 2, 3, 4) that represent, perhaps, “power”, “ease of use”, etc.

   The hypothetical results of a semantic scaling survey are summarized in the table below:

	Attribute				
Brand	1	2	3	4	Price
A	7	3	5	2	$45
B	7	4	4	4	$53
C	6	5	5	6	$55
D	6	3	4	2	$35
E	6	4	5	4	$51
Importance	7	6	4	3	

2. To construct a “rough cut” value map from the data, start by transforming the importance ratings to importance weights by summing all of the importance ratings and then dividing each rating by the sum.

	Attribute				
	1	2	3	4	Total
Importance	7	6	4	3	20
Importance Wgt.	35.0%	30.0%	20.0%	15.0%	100.0%

3. Next, calculate an importance-weighted attribute rating for the first brand (A) by multiplying the specific attribute ratings by their corresponding importance weights, and then summing.

   For example, attribute 1 has a calculated importance weight of 35%. Brand A received a rating of 7 on attribute 1. Multiplying the rating (7) times the importance weight (35%) gives an importance-weighted rating of 2.45. Summing the importance-weighted ratings across all attributes gives a combined weighted rating of 4.65.

	Attribute				
	1	2	3	4	Total
Importance	7	6	4	3	20
Importance Wgt.	35.0%	30.0%	20.0%	15.0%	100.0%
A	7	3	5	2	
Weighted	2.45	0.90	1.00	0.30	4.65

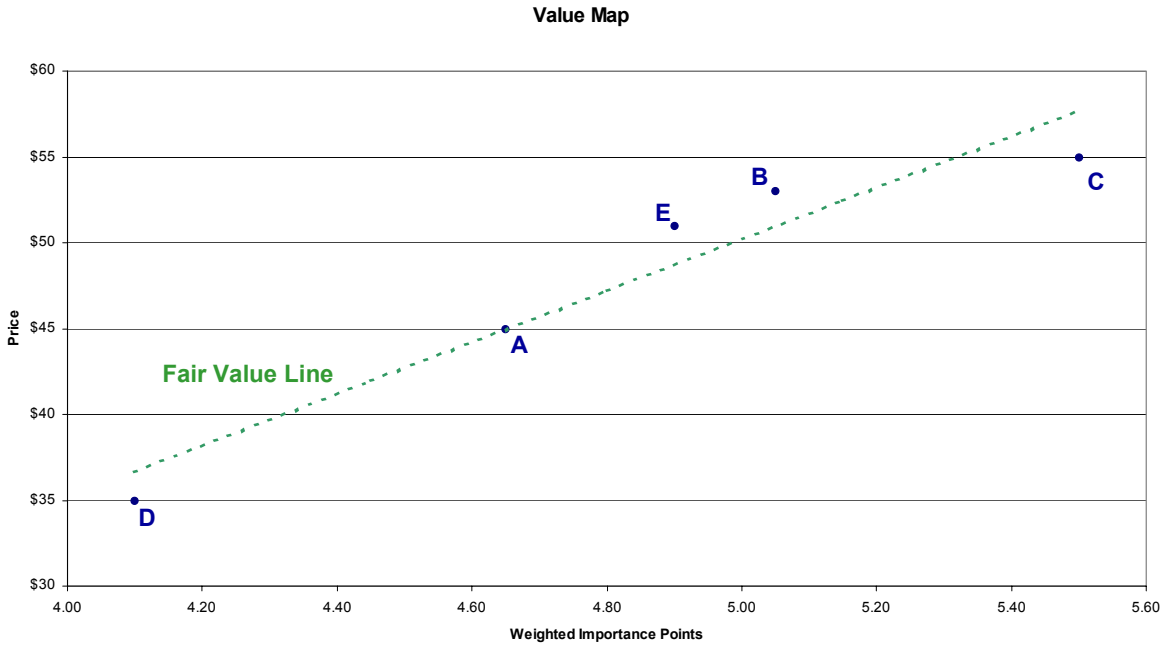
4. Calculate the combined importance-weighted rating for all brands.

	Attribute				
	1	2	3	4	Total
Importance	7	6	4	3	20
Importance Wgt.	35.0%	30.0%	20.0%	15.0%	100.0%
A	7	3	5	2	
Weighted	2.45	0.90	1.00	0.30	4.65
B	7	4	4	4	
Weighted	2.45	1.20	0.80	0.60	5.05
C	6	5	5	6	
Weighted	2.10	1.50	1.00	0.90	5.50
D	6	3	4	2	
Weighted	2.10	0.90	0.80	0.30	4.10
E	6	4	5	4	
Weighted	2.10	1.20	1.00	0.60	4.90

5. For each brand, align the combined importance-weighted ratings with the corresponding brand prices.

	Pref Pts	Price
A	4.65	$45
B	5.05	$53
C	5.50	$55
D	4.10	$35
E	4.90	$51
Sum/avg	4.84	$47.80

6. Plot the combined importance-weighted ratings against brand prices. The chart is a rough-cut value map of the brands surveyed. A fair value line can be approximated via statistical methods (e.g. least squares regression) or by crude "eye balling"



7. Finally, evaluate the map for reasonableness and/or refine the map with more precise statistical methods such as conjoint measurement.