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"Breaking the Mystery about Pricing"

Critical Equation #1 for Business Leaders

$\% \Delta V = - \% \Delta P / (CM \% + \% \Delta P)$

How many times have you heard people say, “If we cut price, we can sell a lot more product”, or “let’s heavily discount this deal to win it…. make our money on future sales.” Pricing is the moment of truth in product planning and business negotiations. Pricing decisions have an enormous impact on the bottom line and, as a result, a company’s ability to create shareholder value over the long run. Yet, nothing is harder to get right (market valuation and market price being equal). Depending on the product/service offering, pricing decisions often are made without full knowledge of their financial impact and often are left to too late in negotiations. Not understanding price-volume trade-offs only exacerbates the situation and results in the sub-optimization of profit.

With the equilibrium of supply and demand as an underlying assumption, pricing models abound from: target costing, dynamic, cost plus, ROI, markup, firm-fixed, go with the flow, on-demand, time-value, decoy, risk-based, and consultative and value-based in the framework of customer economics. All have embedded varying degrees of price-volume tradeoffs.

Most business leaders and managers are aware of the **“**Power of Price.” Holding everything else constant, price reductions create the worst possible negative operating leverage. Depending on your contribution margin the classic example is of a -1% change in price that can easily result in a -10% change in operating profit (typically far worse than the negative leverage from losing -1% in volume). This is great as a concept during an operations review for understanding large swings in variance to plan, but tricky in practice because many factors might be at play in the price-volume relationship.

Most managers typically operate under an expectation of meeting their top and bottom-line commitments. Understanding their price-volume relationships and making appropriate decisions have a direct bearing on their ability to meet these commitments and achieve the desired business results. This is important for two obvious reasons. On the personal side, most forms of executive remuneration are tied to business performance, which is a direct result of managers’ meeting their commitments. On the enterprise side, commitments typically roll up to a guidance number (or range) given to investors. Even in an environment of decreased guidance, internal targets exist, and capital markets worldwide still react positively to meeting and/or exceeding commitments and place a premium on predictability.

Business leaders operate in ever-changing market conditions, from competitive actions to macro-economic risks. From a pricing perspective, managers must be able to reasonably answer the following questions if they hope to make their commitments:

If price is reduced, what volume is needed to make up the difference and meet our profitability commitments?

If price is increased, how much volume can we afford to lose and still meet our profitability commitments?

Which brings us to the price– volume equation every business leader must know:

% Change in Volume = - % Change in Price / (CM % + % Change in Price)

Contribution Margin (CM) or sales less variable cost per unit in cost accounting is the contribution of each unit of production to fixed costs and profits. For this analysis, CM can be considered analogous to Gross Margin (GM). Below is a simplified spreadsheet of how CM is calculated. GM and CM are important to understanding the relationship between revenue and covering your fixed costs of production.

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Cost – Volume – Profit Analysis

Sales	**100%**
-Variable Cost	**-50%**
Contribution Margin (CM)	**50%**
-Fixed Costs	**-20%**
Operating Margin (OM)	**30%**

As an example, what % change in volume is needed to maintain our CM margin in $ (or whatever currency you operate in) with an initial CM% of 50% and price change of -20%?

% Change in Volume = - (-.20) / (.50 + -.20) = .2/.3 = 67 %

Does this sound like a lot of volume? Think of the excess capacity you would need or your ability to outsource quickly to achieve this volume. Is the market even there? And what if your competitor(s) simultaneously drop price? Note, how fast price cuts seem to be met in the infamous dynamics of airline pricing.

Interestingly, the forgoing example assumes an initial CM% (initial meaning pre-price shock) that is high for many businesses. CM% is reasonably close to Gross Margin if your accounting system is not in a Cost-Volume-Profit (CVP) framework. Let's see what happens when we reduce the CM% to 40% in our analysis, which is still higher than the run rate in the U.S. economy across all industries.

% Change in Volume = - (-.20) / (.40 + -.20) = .2/.2 = 100 %

The volume offset to meet the commitment quickly gets completely out of reach!

The relationship as presented ignores productivity. Increased productivity would reduce the volume needed to offset the price decline per the equation. A logical case also can be made that the incremental volume itself would generate some variable cost economy to scale (e.g., supplier leverage). For example, if the 67% increase in volume simply was not feasible and you have a -20% price shock and 50% CM, you would need 40% variable cost productivity (VCP) to maintain your commitment. Ask yourself when was the last time you had 40% VCP? Even masters of VCP and six sigma rarely see more than 4 to 5% on an annual basis.

If you are not an "equation person" consider the graph below. The left axis is the price drop, the right lines are the initial CM% (i.e., before price shock), and the X-axis is the volume response. Find where the 20% drop on the left intersects the curves that correspond to the CM% and you will find the volumes to the aforementioned problems. This graph illustrates that as the initial margin decreases, the volume needed to offset the price change grows dramatically. In fact, a careful review reveals the common sense notion that once the price drop exceeds the initial CM% no volume can meet your commitment. For the economist in all of us, an implicit price elasticity of demand is embedded in these numbers.

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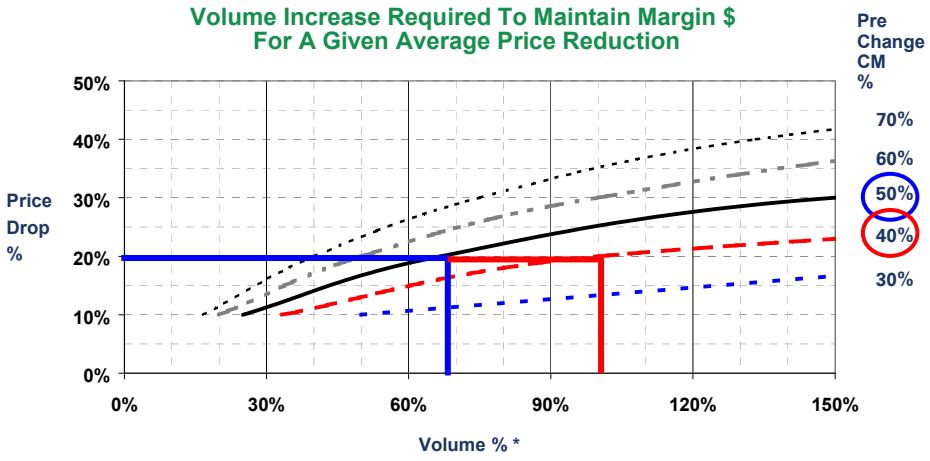
Price Reduction Economics



*Graph assumes no variable cost efficiencies with increased Volume. Variable Cost Productivity would reduce unit volume requirements

One reason companies see their stock prices fall when they announce price cut strategies is that they do not fully understand the implications of this equation or competitive reaction or both. Their analysis may show that the expected gains in market share and productivity (from scale economies) more than offset the minimum to meet a commitment. Remember personal computer price moves in the early 2000s, fast food providers' cutting the price of hamburgers in Japan by 50% (admittedly, around some unique conditions), or video game makers' announcing to cut price on certain games by 20%?

Given their margins and market penetration, the incremental volume required to maintain profitability was enormous, and investors discounted company valuations as a result. A profitable aftermarket may have been a motivation, or being the supposed low -cost provider, or pursuing growth by penetrating the income pyramid, or all

of the above. The necessary volume, however, was still enormous given the competitive markets these businesses faced.

Another interesting application of the price–volume equation is in supplier management and negotiations. Assuming you generate growing volume for your supplier, you should be able to use the equation and the knowledge of your supplier's economics to negotiate price concessions. Ideally, these concessions would help both you and your supplier meet your commitments as it is a decidedly short- term outlook to not value your suppliers' meeting their commitments as well as you. Always help everyone in your value chain meet their commitments and work within their budgets. Give them the volume (or concentrate on a few with backups, if needed) to get the price down via the equation.

Caution is warranted here as a mathematical exercise can be a short-term myopic framework that ignores the longer-term value of volume (such as the aforementioned aftermarket creation), numerous types of economies of scale, and quality differentials to the competition. These well- known life-time value arguments, however, assume you can achieve the longer-term volume play and probably are operating in an oligopoly.

Before you consider that next price drop or start a price war, at least, consider the above. Ask your finance team to model the equation (or make sure its logic is built into your econometrics) and have every one in your sales organization carry the graph with them. Current economic conditions have played havoc with prices in so many industries and have led to all kinds of tactics in price reductions, some rational and a few irrational.

We have given you our perspective on that moment of truth called pricing. We believe that meeting commitments is a fundamental responsibility of business leaders regardless of economic conditions. Understanding the price-volume equation helps you understand one of the most important drivers of those commitments. Try putting your own CM% into the model we have provided on our website and see how your company's unique price-volume trade-offs look. If you have questions or want more information on pricing please contact us at TRIContact@tri-simulation.com.