August 2020

Rule of Thumb Marketing Optimization

It's often important to quickly identify a rough but appropriate range of marketing spend for a company. This can help anticipate the results from a more comprehensive analysis or perhaps just serve as a sanity check. A quick and simple way to do this with the equation,

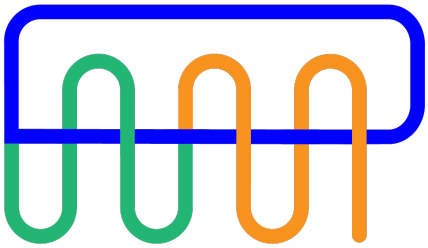
$$(1)\ Opt\ Mkt\ Spend = Profit\ Margin * Revenue * Total\ Mkt\ Elasticity.$$

A company's revenue and profit margin can often be ballparked if not known. Profit margin tends to be consistent within a vertical.

The last term in the equitation, total marketing elasticity or TME, is a measure of the overall effectiveness of a company's marketing. Marketers don't typically think in terms of elasticity, but it is currency for marketing data scientists and this equation provides an example of why it's so important. We suggest considering a TME in the broad range of 5% to 30% as this is a typical range for TME. On the high side a TME of 30% would imply that marketing is very effective at driving revenue and this can serve as an upper limit. On the low side, a TME of 5% implies that marketing is struggling.

This calculation has easily accessible inputs and gives a reasonable range for appropriate marketing spend. It needs to be noted that the equation gives the optimum marketing spend to maximize profit given a stable market. Obviously, a company entering a new market, launching a new product or just looking to grow will market at a *reasonably* a higher level. And, at launch when there is no revenue, this equation is clearly inappropriate. The equation only serves as a benchmark. A stable business in a stable market with a marketing spend significantly higher is overinvested in marketing.

PW Measurement, LLC
info@pwmeasurement.com
718-623-0363



Derivation

So, where does this come from? We want to maximize Profit, *P*. Profit is related to Revenue, *R,* profit margin, *g*, and total marketing spend, *M*, by,

(2) $$P = g * R - M.$$

Next, we need to understand how marketing spend, *M*, drives revenue, *R*. For this we rely on a simple equation that has been used extensively in academic marketing research and is at the core of many Marketing Mix Models (MMM). It relates *M*, *TME* and a constant *k,* to *R.* This equation is,

(3) $$R = k * M^{TME} .$$

We put the Revenue equation into the Profit equation to get,

(4) $$P = g * k * M^{TME} - M \ .$$

What's left is to find the Marketing spend that maximizes Profit We do this by taking the derivative of *P* with respect to M,

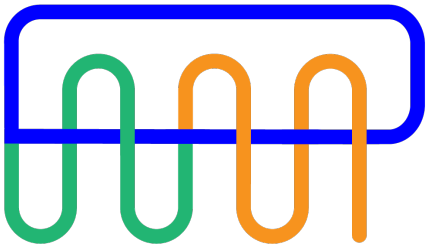
(5) $$\frac{dP}{dM} = TME * g * k * M^{TME-1} - 1 \ ,$$

(6) $$\frac{dP}{dM} = \frac{1}{M} * TME * g * k * M^{TME} - 1 \ ,$$

(7) $$\frac{dP}{dM} = \frac{1}{M} * TME * g * R - 1 \ .$$

Profit is maximized when the derivative is equal to zero,

PW Measurement, LLC
info@pwmeasurement.com
718-623-0363



(8) $0 = \frac{1}{M} * TME * g * R - 1$,

(9) $optimal\ M = TME * g *$ R.

This is the final form presented above. We know it's a maximum because the second derivative of (5) is negative.

Conclusion

While the math is solid, the derivation depends on a simple revenue formula that assumes TME is constant. A marketing elasticity is the percentage change in sales divided by the percentage change in marketing spend. This naturally incorporates diminishing returns for realistic marketing elasticities that are well below 1.0. The constant elasticity assumption isn't really true but has a history in academic marketing research. We have found that for many companies, elasticity tends to decrease with increased marketing spend but this isn't very significant to the formula.

Any simple formula such as this will miss important dynamics such as growth and competitive threats. However, the simplicity is a virtue which helps make it useful.

PW Measurement, LLC
info@pwmeasurement.com
718-623-0363