

Basic Quantitative Analysis

- Intuition is not enough for marketing
- Quantitative analyses require:
 - familiarity with key concepts
 - knowing which numbers to look at
 - paper and pencil, or calculator, or Excel



Key Concepts

- (unit) Market share of A = $\frac{\text{number of units sold by A}}{\text{total number of units sold by all companies in a product category}}$
- (dollar) Market share of A = $\frac{\text{dollar value of units sold by A}}{\text{total dollar value of units sold by all companies in a product category}}$

Key Concepts

- Total Cost = Fixed cost + Total variable cost
 $= FC + (k \times V)$
 where V : volume or quantity k : unit variable cost
- Unit Contribution = Price – Unit variable cost
 $= P - k$
- Total Contribution = Total revenue – Total variable cost
 $= P V - k V = (P - k) V$
- Profit = Total revenue – Total cost = Total contribution – Fixed cost
 $= P V - FC - (k \times V) = (P - k) V - FC$

Key Concepts

Example: Vandelay Ind. sells frozen pizza. Sales figures:

Price (\$)	Sales (weekly)
7.50	600
6.00	700
5.00	1000

What is the price that maximizes total contribution if the unit variable cost k is \$4?

Key Concepts

Margin = selling price – acquisition price of a good
(also called *unit contribution*, or *markup*)

Percent margin = margin / selling price

Key Concepts



manufacturer's
margin

wholesaler's
margin

retailer's
margin

=
% =

LVC Calculation - Example

- You own a tennis club where the annual membership fee is \$300.
- An average club member spends \$100 a year at the club (tennis balls, drinks, snacks). Average percent contribution margin on these expenditures is 60%.
- On average people who join the club have a playing career of 6 yrs.
- Historically, 80% of the members in a given year rejoin in the following year.
- Cost of acquiring a new member is \$175. Annual marketing costs per each existing member is \$40.
- What is the lifetime value of a tennis member? (assuming a discount rate of $d = 15\%$)

LVC of a Tennis Member

Year	Member Fee	Contr. from Expend	Cost of Acquiring a new m.	Annual Marketing Cost	Cash Flow from Member if Retained	Probability of being retained	Expected Cash Flow from Member
0							
1							
2							
3							
4							
5							
6							

Discounting

But, money has a time value

\$ we receive one year from now has less value than \$ we receive now

[\$1] today = [$\$(1+d)$] one year from today

or [$\$1 / (1+d)$] today = [\$1] one year from today

\$ two years from now has even less value ... $1 / (1+d)^2$

➤ Discount rate d is firm specific

it depends on the firm's opportunity cost for money

d : discount rate

$1 / (1+d)$: discount factor

Discounting

Assuming $d = 15\%$, or $d = 0.15$:

discount factor for 1 year : $1 / (1+d) = 0.87$

discount factor for 2 years : $1 / (1+d)^2 = 0.76$

discount factor for 3 years : $1 / (1+d)^3 = 0.66$

discount factor for 4 years : $1 / (1+d)^4 = 0.57$

etc.

LVC taking into account discounting

Year	Cash Flow from Member if Retained	Probability of being Retained	Expected Cash Flow from Mem.	Discount Factor	Net Present Value of Expected Cash Flow from Member
0			-\$175	1	-\$175
1	\$320	1.00	\$320	0.87	\$278
2	\$320	0.80	\$256	0.76	\$195
3	\$320	0.64	\$205	0.66	\$135
4	\$320	0.51	\$164	0.57	\$93
5	\$320	0.41	\$131	0.49	\$64
6	\$320	0.33	\$105	0.43	\$45

LVC = \$635

Break Even Analysis

Break Even Analysis: a tool to evaluate the *feasibility* of a prospective strategy. The idea is to determine the amount of sales the strategy must generate in order for it to *at least* pay for itself.

BE volume : volume at which Profit = 0

or Total revenues = Total costs

BE time ?

$$\text{BE Volume} = \frac{\text{Fixed Cost}}{\text{Unit Contribution}}$$

Example

Migrosoft manufactures and sells pillows:

price per unit: \$10

variable cost: \$5.50 / unit

fixed costs: \$15,000

what is the BE Volume?

Break Even Analysis

BE Sales Change: used to evaluate the profitability of a price change.

A price change breaks even if:

unit sales with the new price \times unit margin with the new price $>$
unit sales with the existing price \times unit margin with the existing price

Break Even Analysis

Example: Migrosoft average monthly sales and costs are:

sales: 4000 units

price per unit: \$10

variable cost: \$5.50 / unit

fixed costs: \$15,000

Management is considering a 5% price cut, and has asked you to determine how much sales would have to increase for them to benefit from the price cut.

Break Even Analysis

To do a BE, you have to know or estimate the following:

1. **Unit price** at which the product will be sold
2. **Unit (variable) cost** of the product
3. **Contribution margin** (1. - 2.)
4. **Fixed costs** associated with the strategy
5. **Likely demand** upon implementation of the strategy (to calculate BE time)

Break Even Analysis

- Break-even analysis provides a benchmark
- Consider
 - market size
 - market growth
 - degree of competition