

The Rates of Return on A Marketing Investment Chapter 2

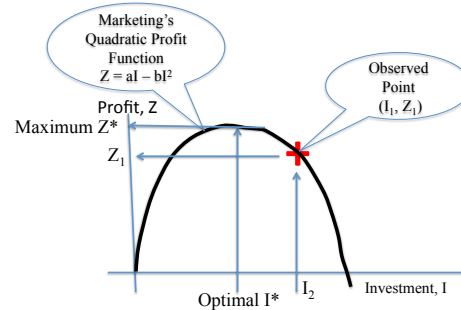
Ted Mitchell

Rates of Return on Marketing Investments

- Learning objectives
- 1) To know the Two Rates of Return for Marketing Investments:
Average Rate of Return, AROR,
Marginal Rate of return, MROR
- 2) To know how each rate of return is derived from the Marketing Profit Function
- 3) To be able compare and contrast the AROR to the MROR
- 4) To calculate the values of the rates of return

We have learned that

- Marketing profit is defined as the financial gain from the seller's investment in customer value
- The amount of marketing profit, Z , is a function of the size of the seller's investment, I ,
 $Z = f(I)$
- The Marketing Profit Function, Z , reflects a quadratic relationship with the size of a marketing investment, I
- Marketing Profit Function, $Z = aI - bI^2$



Marketing Investments have

- Two Different Rates of Return
- 1) The investment's average rate of return, AROR
- 2) The investment's marginal rate of return, MROR
- Both Rates of Return are Derived from the Marketing Investment's Profit Function

Two Parts

- 1) First: the nature of the marketing investment's **Average Rate Of Return**, AROR
- 2) Second: the nature of the marketing investment's **Marginal Rate Of Return**, MROR

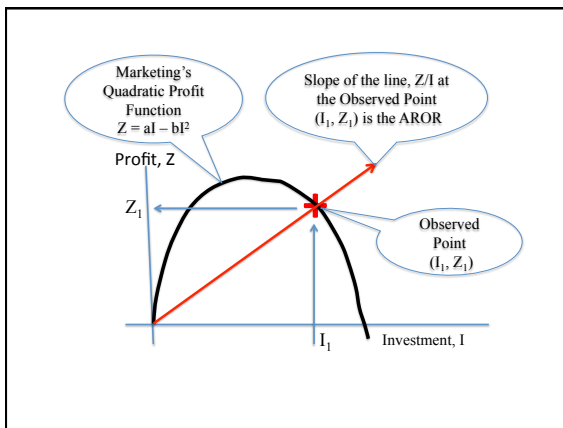
A Single Point Estimate of the Average Rate of Return

- AROR for any single observed point of performance (I, Z) is calculated as the total observed profit, Z, divided by the observed investment, I, at that point
 $AROR = \frac{\text{Total Profit, } Z}{\text{Total Investment, } I}$
- AROR is the slope, Z/I , of the line from the origin (0, 0) to the point (I, Z) on the profit function

Estimating The AROR at a Single Point, (I, Z)

		Observation #1	Calculated AROR
Investment, I	I_1	$I_1 = \$1,500$	
Rate of Return	$AROR = Z_1/I_1$		AROR = $\$7,500/\$1,500$ AROR = 5 or AROR = 500%
Profit, Z	Z_1	$Z_1 = \$7,500$	

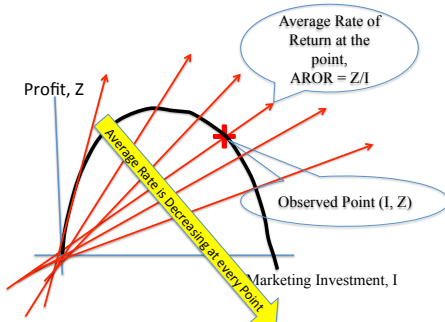
Rates of Return on Marketing Investments are normally reported as percentages.



The Average Rate Of Return for any Point on the Profit Function

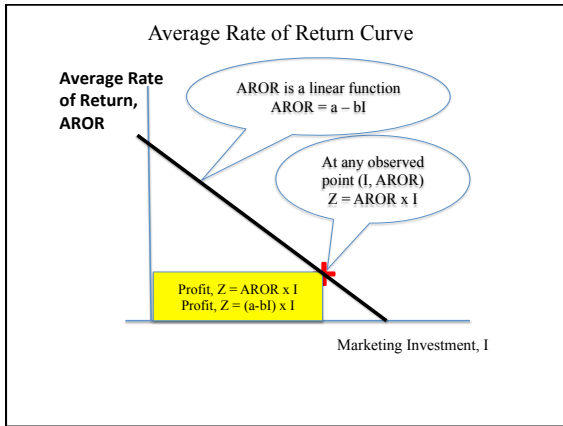
- AROR is calculated for any point on the profit function with the total profit function, $Z = f(I)$ divided by the total Investment, I
 $AROR = f(I)/I$
- $AROR = (aI - bI^2)/I$
- $AROR = a - bI$

The Average Rate of Return, $AROR = Z/I$

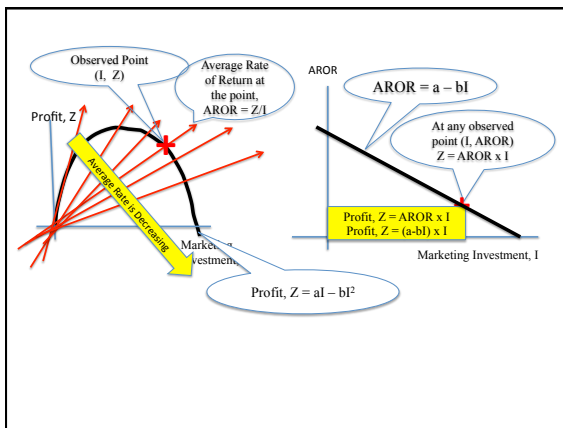


The Average Rate of Return at any point on the profit function

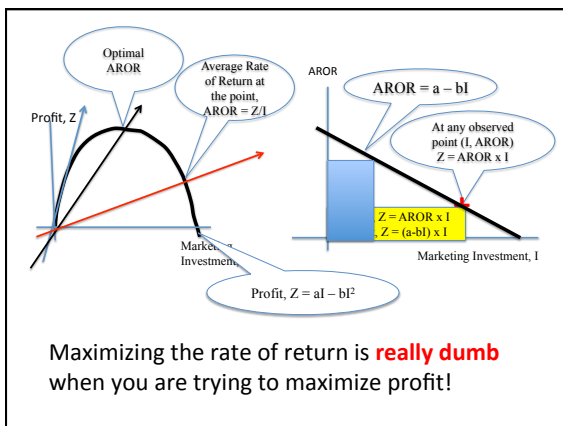
- $AROR = a - bI$
- Is also a function!
- AROR is a linear function of the investment's size



- ### The Average Rate of Return at any point of the profit function
- $AROR = a - bI$
 - AROR is a linear function of the investment's size
 - AROR **changes** as the size of the investment changes
 - AROR is **NOT** independent of the investment
 - AROR has a **negative relationship** with the investment's size
 - AROR gets smaller (the rate of return gets slower as the investment gets larger



- ### The Average Rate of Return at any point of the profit function
- $AROR = a - bI$
 - AROR provides **NO Clue** as to the optimal size of the investment to maximize profit
 - When AROR is very large (a fast return) the **profit is very small**
 - When AROR is very small (a slow return) the **profit is very small**



- ### The most important role
- For the Marketing Investment's Average Rate of Return is in the definition of marketing profit, Z,
 - Marketing Profit is defined as the product of the investment's average rate of return, AROR, times the size of the marketing investment, I
 - Marketing Profit, $Z = (AROR) \times (Investment, I)$
 - Marketing Profit, $Z = (a - bI) \times I$
 - Marketing Profit Function, $Z = aI - bI^2$

Managers Calculate AROR in two different ways

- 1) AROR for any **single observed point** of performance (I, Z) is calculated as the total observed profit, Z, divided by the observed investment, I, at that point
AROR = Z/I
- 2) AROR is calculated **for any point** on the profit function using the Average Rate Of Return Function
AROR = $a - bI$
requires estimates of the constants a & b

Important Learning Points

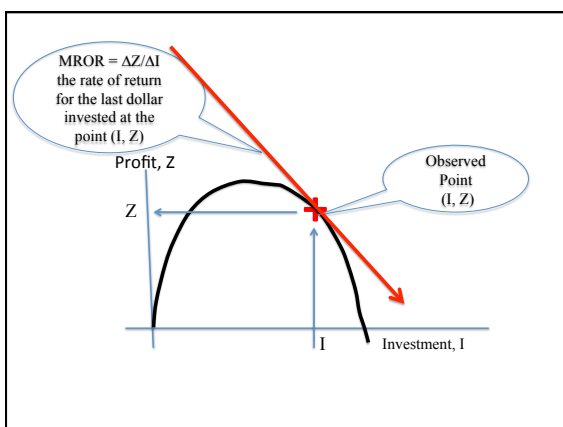
- 1) The AROR is a linear function of the investment's size, AROR = $a - bI$
- 2) The average rate of return from a marketing investment is always decreasing (slowing down) as the size of the investment is increasing
- 3) The value of the AROR **provides no clue** as to the optimal size of the investment
- 4) **Maximizing AROR is a dumb strategy**
A choice of an investment with a higher AROR may actually reduce total profits

Any Questions on

- The characteristics of the
- **Average Rate of Return, AROR**, for a marketing investment?

Marketing Investments have

- Two Different Rates of Return
- 1) An Average Rate of Return, AROR
- 2) An **Marginal Rate Of Return, MROR**,



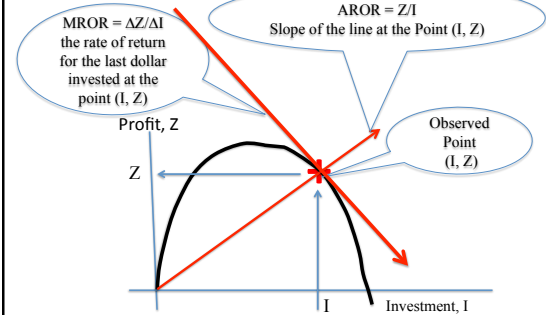
The Marginal Rate of Return, MROR

- Is the rate at which profit is earned from the last dollar invested
- Often called the incremental change in profit, ΔZ , for the last increment amount of investment, ΔI
- The MROR at any single point on the Profit function can be estimated by the ratio of small changes $\Delta Z / \Delta I$ near the point (I, Z)
- Compared to the Average Rate of Return, AROR is the ratio of the total profit over the total investment, Z/I , at the point (I, Z)

Estimating The MROR at a Single Point, (I, Z)

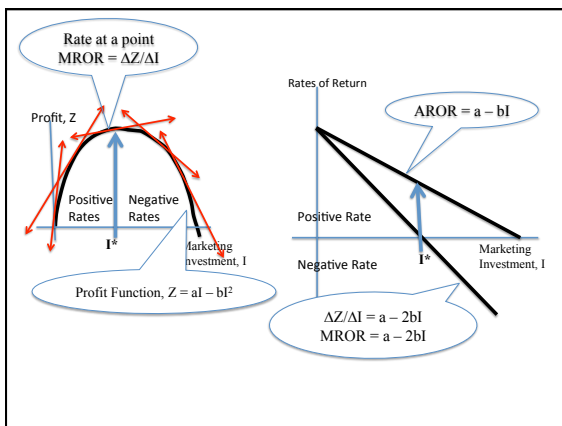
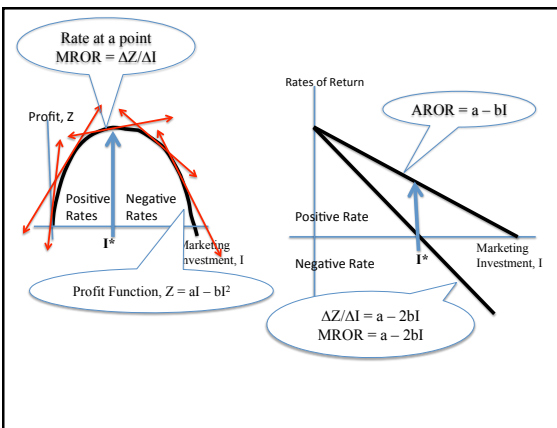
	Observation #1	Observation #2	$\Delta = \#2 - \#1$
Investment, I	I_1	I_2	$\Delta I = I_2 - I_1$
Rate of Return	$AROR = Z_1/I_1$		$MROR = \Delta Z/\Delta I$
Profit, Z	Z_1	Z_2	$\Delta Z = Z_2 - Z_1$

Comparing AROR to MROR at a Single Point on the Profit Function



Marginal Rate of Return

- For any point on the marketing profit function is calculated as the first derivative of the profit function with respect to the size of the investment
- Marketing Profit Function, $Z = aI - bI^2$
- First Derivative of Z wrt I, $\Delta Z/\Delta I = a - 2bI$



Important Learning Points about Marginal Rates of Return, MROR

- 1) The MROR is a linear function of the investment's size, $MROR = a - 2bI$
- 2) The MROR from a marketing investment is always decreasing (slowing down) as the size of the investment is increasing and slowing down twice as fast as the AROR
- 3) The value of the MROR **does provides a clue** as to the optimal size of the investment
The optimal level of marketing investment which will maximize profit is when **MROR = 0**
- 4) The choice of an investment size with a negative MROR or a positive MROR results in **SMALLER** profits

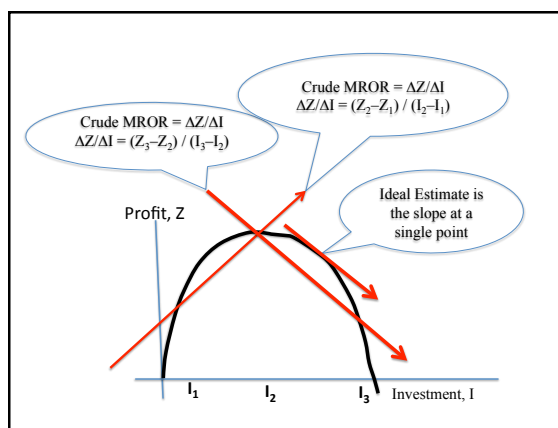
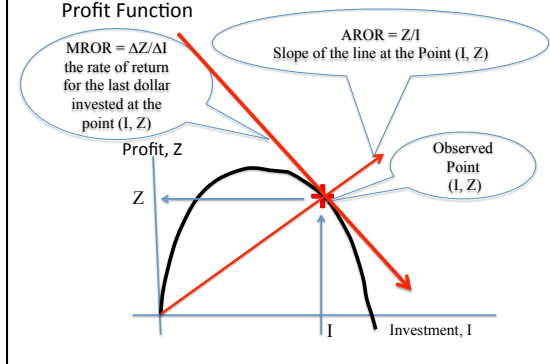
Estimating The MROR at a Single Point, (I, Z) Takes the Difference Between Two Observations

	Observation #1	Observation #2	$\Delta = \#2 - \#1$
Observed Investment, I	$I_1 = \$1,500$	$I_2 = \$2,000$	$\Delta I = I_2 - I_1$ $\Delta I = \$2,000 - \$1,500$ $\Delta I = \$500$
Calculated Rate of Return	$AROR = Z_1/I_1$ $AROR = \$7,500/\$1,500$ $AROR = 500\%$		$MROR = \Delta Z/\Delta I$ $MROR = \$500/\500 $MROR = 100\%$
Observed Profit, Z	$Z_1 = \$7,500$	$Z_2 = \$8,000$	$\Delta Z = Z_2 - Z_1$ $\Delta Z = \$8,000 - \$7,500$ $\Delta Z = \$500$

The AROR can be positive while the MROR is Negative

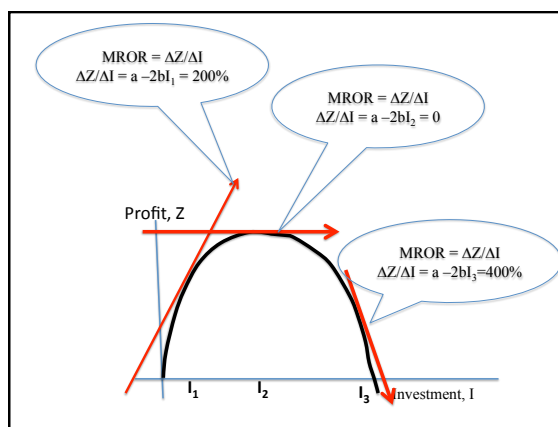
	Observation #2	Observation #3	$\Delta = \#3 - \#2$
Observed Investment, I	$I_2 = \$2,000$	$I_3 = \$3,000$	$\Delta I = I_3 - I_2$ $\Delta I = \$3,000 - \$2,000$ $\Delta I = \$1,000$
Calculated Rate of Return	$AROR = Z_2/I_2$ $AROR = \$8,000/\$2,000$ AROR = 400%		$MROR = \Delta Z/\Delta I$ $MROR = \$-2,000/\$1,000$ MROR = -200%
Observed Profit, Z	$Z_2 = \$8,000$	$Z_3 = \$6,000$	$\Delta Z = Z_3 - Z_2$ $\Delta Z = \$6,000 - \$8,000$ $\Delta Z = -\$2,000$

Comparing AROR to MROR at a Single Point on the Profit Function



Numerical Examples of

- Measuring the MROR at any point on the marketing profit function using the first derivative of $Z=f(I)$
- $\Delta Z/\Delta I = a - 2bI$
- $\Delta Z/\Delta I = 8 - 2(0.002)I$
- #1) when investment is $I_1 = \$1,500$
 $MROR = 8 - 2(0.002)1,500 = 2$ or 200% return
- #2) when investment is $I_1 = \$2,000$
 $MROR = 8 - 2(0.002)2,000 = 0$ or 0% return
- #3) when investment is $I_1 = \$3,000$
 $MROR = 8 - 2(0.002)3,000 = -4$ or -200% return



Compare and Contrast

- Average Rate of Return
- AROR reported as a %
- Single Point estimate of AROR = Z/I
- AROR is the profit function divided by the investment
AROR = $(a-bI^2)/I$
AROR = $a - bI$
- Is a linear function of the investment's size
- Is always slowing down but is always positive
- Provides **NO** clue as to optimal size of investment
- Marginal Rate of Return
- MROR reported as a %
- Single Point estimate of MROR = $\Delta Z/\Delta I$
- MROR as the first derivative of the profit function
- MROR, $\Delta Z/\Delta I = a - 2bI$
- Is a linear function of the investment's size
- Is always slowing down but can be positive or negative
- **DOES** provide a clue as to the optimal size of investment when MROR = 0

When Does The AROR

- Become designated as being the investment's Return on Investment, ROI?
- Answer: When the marketing investment has reached maturity and the marketing project, it was associated with, is over, then accountants will look at the ratio, Z/I , of the total profit, Z , earned from the investment and the total amount of money spent on the investment, I , and proclaim the ratio Z/I to be the Return On Investment, ROI
- $Z/I = ROI$
- ROI is the investment's final AROR

What do the **a** and the **b** signify

- In the Profit Function and the Rates of Return?
- Marketing Profit Function, $Z = aI - bI^2$
- Average Rate of return, AROR = $a - bI$
- Marginal Rate of return, MROR = $a - 2bI$
- **Yes**, the **a** & **b** represent the same thing in each and have the same constant values
- The constant **a** can be treated as the rate of return from the business initiation expense that created the core offering for the target market
- The constant **b** can be treated as the amount lost in the average rate of the return for every additional dollar invested in the offering

Are the AROR and MROR

- of a marketing investment the same thing as the Return on Marketing Investment, ROMI, and or the Marketing Return on Investment, MROI?
- Sometimes, Yes!
- ROMI and MROI are confusing acronyms because they are defined and used in so many different ways by marketing managers
- We avoid using the acronyms ROMI and MROI to reduce the confusion associated with the rates of return on marketing investments

What about time involved?

- The Marketing Profit Function, Z is prepared for an investment over a fixed period of time. The time it takes for the profit from an investment to be realized can be long or short. The time value of money must be built into the profit function.
- The time period may be very short (days or weeks) for an investment in a promotion or ad campaign.
- The time period may be very long (years or decades) for an investment in a store's furnishings, ambiance or location.

Is the rate of return on a marketing investment

- calculated in the same way as the rate of return on a financial investment?
- For the measurement of an investment's rate of return at a single point on the profit function drawn from a single observation of the profit, Z , and investment, I , then both are calculated with the same procedure
- However, in general they are different
- Financial Profit Function reflects a direct relationship between profit and investment and is defined as
 $Z = r(I)$
- Marketing Profit Function reflects a quadratic relationship and is defined as
 $Z = (a - bI)I$
- The financial and marketing rates of return are very different functions and behave very differently to changes in investment size

The Marketing Profit Function

- Is concerned with the amount to be spent on the seller's investment in the amount of value customers see his offering.
- Customer value reflects the benefits the customer sees in the product, the placement of the product and the promotion of the product.

ANY QUESTIONS ABOUT

- The Profit Function for a Marketing Investment, $Z = aI - bI^2$
- A Marketing Investment's Average Rate of Return, $AROR = a - bI$
- A Marketing Investment's Marginal Rate of Return, $MROR = a - 2bI$
- Marketing profit as the Marketing Investment's Average Rate of Return times the amount of Investment, $Z = AROR \times (\text{Investment}, I)$
- Returns on Marketing Investments are reported as the percentage gain from the dollars invested in the offering's value to the customer