

The Management of Marketing Profit: An Investment Perspective

Draft of Chapter 1: A Philosophy of Competition and An Investment in Customer Value Ted Mitchell, May 1 2015

Learning Objectives for Chapter 1

- 1) To know the definitions of a market, a market segment and a target market
- 2) To know that the over arching goal of the marketing manager is profit
- 3) To know the 4Ps of the marketing mix and the importance of their integration
- 4) To conceptualize the 4Ps as the ingredients for the marketing mix, which determine the amount of value a customer finds in the seller's offering,
- 5) to know that the basic premise of marketing management is that a customer will choose to purchase the offering which contains the most value for that customer, and the purchase, in turn, generates the seller's revenues, and profits.
- 6) To know the marketing concept as a philosophy of competition and be able to compare it to other types of competitive philosophies, such as the sales concept, the production concept and the product concept.
- 7) To conceptualize the basic marketing process as if it were a vending machine, which converts the ingredients of the marketing mix as if they were inputs into customer demand, sales volumes, profits, and loyal, satisfied customers.
- 8) To understand the underlying arguments for the quadratic relationship between total marketing profit and the amount of customer value in the seller's offering.
- 9) To understand that the definition of marketing profit is the financial gain from an investment in the amount of customer value the seller puts into his offering.
- 10) To know that the calculation of marketing profit, ($Z = AROR \times I$) is the product of the marketing investment's average rate of return, AROR, times the size of the seller's investment, I, in customer value.
- 11) To conceptualize the marketing profit function as a quadratic relationship between profit and marketing investment and to use the quadratic equation ($Z = aI - bI^2$) to calculate profits and the average rate of return.

Introduction

In the traditional science of marketing management, the definition of a market in is people with needs and wants, with money to spend satisfying those needs and wants, and with the authority to purchase the means of satisfaction. The definition of a market as people buying things differentiates the marketing definition from the economist's definition of markets as groups of things being sold, such as the car markets, the housing markets, etc. The market place is where the sellers present their offerings (a bundle of product and services which serve customer needs or solve problems) to prospective customers.

The primary activity of the marketing manager is to create offerings with sufficient customer value such that the customer will be induced to purchase the offering and provide a profitable transaction for the seller. In modern times the focus of the marketing manager is to find a segment of customers with similar needs and wants that could be targeted with an offering tailored to their serve their specific needs and would be differentiated from competitive offerings by the offering a superior level of customer value to that particular segment.

Segmentation is a process of dividing a mass market of heterogeneous customers into smaller groups of customers with homogenous needs and wants. A market segment is defined as a group of people with relatively homogenous needs and wants that can be reached with a specific offering and will react to the offering in a similar way. There are, of course, many thousands of market segments. However, marketing managers are interested in those segments that are sufficiently measureable, accessible, sustainable, and profitable to support the cost and effort of creating an offering tailored to meet the specific needs of the targeted segment. There is no guarantee that the process of segmenting a large market will result in meaningful segments for targeting. It may be necessary when dealing with a large, fragmented and diffuse market to adopt a strategy of mass marketing rather than targeted marketing.

Basic Types of Marketing Strategies

Mass marketing and target marketing are two different marketing strategies. Segmentation is not a strategy. Market segmentation is a process that is necessary before one can choose between the strategies of mass marketing and targeted marketing. In the modern world the degree of segmentation that can be accomplished allows for the possibility of very small groups of people to be identified as potentially profitable segments. The modern distribution system and internet allow for micro-segments to be served profitably.

The Goal for Marketing Managers

The overarching goal of marketing management is to maximize profits. That is to say, the fundamental task of marketing managers is the maximization of profits through the creation of profitable transactions from customers who can be identified, communicated with, and who are profitable to sell to. A marketing manager may have short-term objectives such as increasing sales volumes, increasing revenues, increasing customer awareness, increasing customer satisfaction, etc. However, the overarching goal is **not** to maximize customer satisfaction; it is **not** to maximize sales revenue; it is **not** to maximize market share and it is **not** to maximize gross profits or the number of profitable transactions. The overarching goal of the marketing manager is to maximize the total marketing profits generate from the firm's marketing efforts. Maximizing total marketing profit is accomplished through the design of an offering that serves a targeted market more efficiently and more effectively than the competitors' choice of offerings. The professional marketing manager adopts the marketing concept as his or her philosophy of successful competition.

The Marketing Concept

The marketing concept is a philosophy of successful competition which originated in the 1950's and has been presented in many different ways. The best known version of the philosophy was proposed by Philip Kotler (1971, 2007), "The Marketing concept holds that the key to achieving organizational goals consists of the company being more effective than its competitors in creating, delivering, and communicating superior value to its chosen target markets." Organizations can have many different goals and objectives; however, the most important one for business is profit.

There are many alternative philosophies of successful competition. These include the Production Concept, the Product Concept, the Selling Concept, etc. Philip Kotler (2007) describes the alternative philosophies as:

"The **production concept** holds that consumers will prefer products that are widely available and inexpensive."

"The **product concept** holds that consumers will favor those products that offer the most quality, performance, or innovative features."

"The **selling concept** holds that consumers and businesses, if left alone, will ordinarily not buy enough of the firm's products. The organization must undertake aggressive selling and promotion effort."

However, traditional marketing concept is the most successful of the alternative philosophies for creating sustainable marketing profits through competition.

The 4Ps of the Marketing Mix

When one unpacks the various components of the manager's fundamental task, the first and most salient component is to create an offering for the customer that delivers the benefits the customer wants through the customer's purchase of the firm's products and services. There are four basic ingredients that a marketing manager uses to create the customer value in the seller's offering. These four ingredients are:

- 1) The design of the benefits delivered by the attributes of the seller's **P**roduct and customer service.
- 2) The design of the information content in the communication mix and the **P**romotion of the offering to the customer.
- 3) The design of a convenient time and **P**lace of the transaction and the delivery of the benefits the customer desires,
- 4) The design of the selling **P**rice and other costs involved in the customer acquiring the benefits of the seller's offering.

These four ingredients are often referred to as the four Ps of marketing mix (i.e., **P**roduct **P**romotion, **P**lace and **P**rice) were introduced by Neil Borden in 1960 and popularized by Jerome McCarthy in 1964. They are often described as the independent variables a marketing manager can manipulate to manage customer demand (sales volumes), revenues, and profits. The traditional view is that the marketing mix represents the tools by which the firm can influence sales. A more

modern perspective is that the marketing mix represents the ingredients with which the seller creates customer value.

The Basic Premise of Marketing Theory

The basic premise of marketing management is that the more accurately a firm can adjust the recipe of its marketing mix to better serve the needs of its target customers. When a seller increases the amount of value a customer sees in the seller's offering, then current customers in the targeted market will buy more of the product and/or more of the prospective customers will be induced to purchase the seller's offering. In either event the demand for the seller's offering will increase when the seller increases the amount of customer value invested in the offering.

The 4Ps of the marketing mix are the ingredients which managers use to create the value of the firm's offering to its customers. Although profit, power, and politics are important components of the marketing environment are terms which happen to start with the letter **P**, they are not considered to be elements of the marketing mix. Profit is **not** an ingredient of the marketing mix because it is the goal that drives the design of the offering. Institutional power and politics can have profound impacts on marketing strategy but are usually considered forces outside the control of the marketing manager. Forces, which impact market demand and revenue and which are outside the control of the marketing manager, are **not** considered elements of the marketing mix.

The Recognition and Integration of All Marketing Activities

Modern marketing is about the integration of all marketing activities. Although the 4P's of marketing have been a central component of marketing management for over 60 years, thousands of business practitioners still maintain a very outdated view that marketing refers only to the selling and promotional activities of the advertising and the sales department. Many sales people still refer to the advertising department as the marketing department and do not consider themselves as part of the marketing mix.

Many people in supply chain management, who are obviously responsible for providing the place and time utility of the seller's offering, do not think of themselves as marketing managers. The popular literature and news media continually reinforce the notion that marketing is all about advertising. Marketing management is far more than a synonym for advertising management. However, the fact that various marketing managers are responsible for product design and development, pricing and discount decisions, supply chain organization and vertical market design as well as customer communications seems to be lost in the modern maze of organizational titles and departmental labels.

It is a sad commentary on the current state of marketing management that after 60 years of marketing management being on the business school curriculum there are so many individuals involved in the management of marketing who do not identify themselves as marketers. The fact that marketing management covers a wide array

of skills and career paths underscores the continuing need for courses in the principles of marketing management.

Value Creation

Philip Kotler has been credited with the quotation, “ Marketing is not the art of finding clever ways to dispose of what you make. It is the art of creating genuine customer value (source unknown)” The first task of the marketing manager is to identify those things in a seller’s offering which will provide value to customers. The creation of customer value involves a mix of ingredients assembled from the four P’s of the marketing mix. An offering with greater customer value generates greater demand (quantity sold) or more precisely an offering with greater value relative to the offerings of competing sellers will generate relatively greater demand. The strategic difficulty is to identify an offering for a seller in which customers will find more value compared to competitors’ offerings and which, when purchased, will maximize the firm’s profits.

All four P’s have an impact on customer value. More product quality, transactional convenience, and informative communications all provide benefits to customers and increase the amount of the customer value in the seller’s offering. The size of the price tag and other costs the customer must bear to acquire the benefits of the offering reduce on the customer value in the offering.

Customer value can be defined as the ratio of the benefits the customer receives to the costs of acquiring the benefits,

$$\text{Customer Value, } U = \text{Benefits from the acquisition} / \text{Costs of acquisition}$$

When the ratio is greater than 1 (i.e., unity), then the customer is receiving a positive value from the exchange with the seller. When the ratio is less than 1, then the customer is paying more for the benefits than they are worth. The basic premise in marketing is that the customer will not engage in an exchange when the value of the exchange is perceived as being less than 1 (i.e., unity). Exchange can occur if and only if the buyer perceives the customer value to be greater than 1, $U > 1$

Conceptualizing the marketing process as a machine (Figure 1-1) that creates customer value is the intellectual starting point for the theory of marketing management. However, a process that creates customer value from the benefits in the seller’s offering is abstract. Conceptualizing the marketing process in the more concrete terms usually involves a machine that generates customer value from the marketing mix. A more concrete definition of customer value is the ratio of the dollars the seller spends on providing the benefits found in the product, place and promotion over the price tag the seller sets for the buyers’ acquisition of the offering,

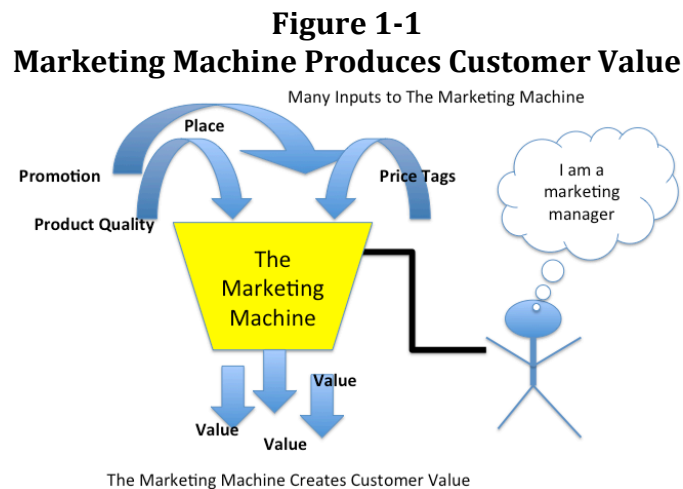
$$\text{Customer Value} = (\text{Dollars Spent on Product, Place and Promotion}) / \text{Price Tag}$$

Defining customer value in terms of dollars spent on providing customer value is a practical, albeit heroic, place to start an analysis. The dollars spent on creating

customer value can be notoriously poor measures of the value a customer perceives in the seller's offering. The perennial difficulty facing market researchers is to find valid measures of customer value that can be operationalized into the design of products, services, distribution systems, promotional campaigns and prices.

The Concept of a Value Creating Machine

The traditional model of marketing management is to conceptualize the manager controlling the ingredients of the marketing mix to create a high level of relative customer value which, in turn, induces a large volume of customer demand, revenue and profit. Marketing management is built upon the idea that the seller's investment in the customer value of his offering that is ultimately responsible for the seller's profits.



An idealistic version of a marketing machine is one that always produces offerings with greater customer value and satisfaction and always generates greater marketing profit for the seller. The ideal machine is a fantasy. The practical difficulty in building an ideal machine is that it costs the seller money to increase customer value and that firms are in the business of maximizing profits and not customer satisfaction. Creating satisfied customers by offering customers more value than the competitor is, of course, a necessary condition to achieve sales. However, the goal of marketing is to maximize profits. It has been said that marketing profit should be considered a by-product of creating customer satisfaction; however, it is more accurate to say that marketing profit is a function of creating customer value.

The Relationship Between Revenue and Customer Value

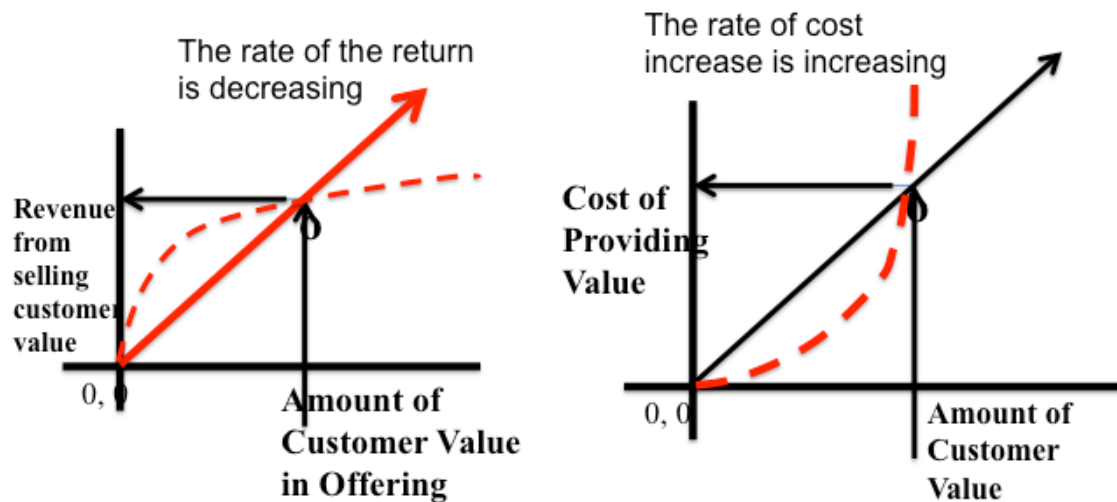
In the 50's and 60's it was not uncommon for people to refer to marketing management as demand or revenue management. The basic premises of demand/revenue management are:

- 1) When the seller increases the amount of customer value, U, there will be an increase in demand and the amount of revenue the firm earns.
- 2) There is a diminishing rate at which demand/revenue is being returned as marketing efforts (i.e., expenses) are increased.

The classic concave relationship between revenue, R , and customer value, U , is easily modeled as the response function, Revenue, $R = kU^e$, where $0 < e < 1$. The result is that both the average and the marginal rate at which revenue is being returned on customer value is always decreasing with increases in customer value (Figure 2-1)

The most obvious things that a seller can do to increase customer value is to increase the amount of product quality, the convenience of place and time for the transaction, and the usefulness of the information in the product's promotion. However, increases in the ingredients which increase value cause increases in the seller's marketing expenses.

Figure 1-2: Revenue and Cost as Functions of Customer Value



The Relationship Between Seller's Cost and Customer Value

A traditional premise of marketing management is that sellers must spend money to increase the amount of value a customer sees in the seller's offering. For simplicity it is often assumed that cost of creating customer value has a linear relationship with the amount of value added. However, it is more reasonable to assume that costs, I , would increase exponentially with additional efforts to increase customer value U (Figure 1-2). The simplest way to describe the increasing rate of cost for increasing customer value is with an exponential equation (e.g., Cost, $I = kU^e$ where $e > 1$) and the result is an increasing average and marginal cost for every additional unit of customer value included in the offering.

Profit as a Function of Customer Value

Marketing profit, Z , from a mechanical point of view is revenue, R , minus marketing cost, I , and the accountant's definition of profit is the margin between revenue and cost ($Z = R - I$). Given the assumption that revenues, R , decrease at an exponential rate and that costs, I , increase at an exponential rate with increases in the amount of customer value, U , then the relationship between profit and customer value is strictly concave. There is an optimal level of customer value, U^* , when the marginal

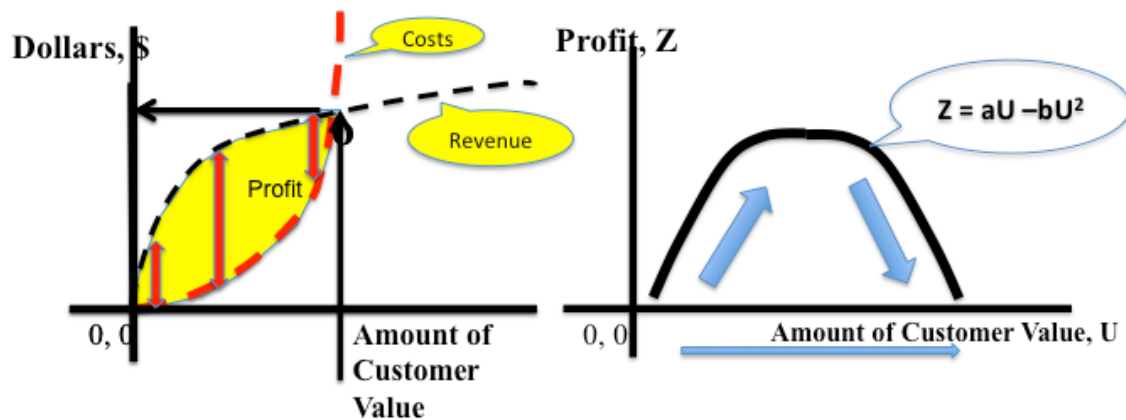
cost of additional customer value is equal to the marginal revenue from the additional unit of customer value (Figure 1-3). The quadratic equation which best describes this relationship is

$$\text{Marketing Profit, } Z = aU - bU^2$$

where the value of the constants, a & b , are determined by market research.

The crucial feature of the quadratic equation which describes the relationship between customer value and the seller's profit is that there is an optimal level of customer value which maximizes the seller's profit and when the seller invests too much into customer value then the seller's profits can decrease.

Figure 1-3: Marketing Profit as Function of Customer Value



Measuring Customer Value With Seller's Investment

It is very difficult to measure the amount of value a customer sees in the seller's offering. The amount of value the customer sees in the seller's offering is correlated to the amount of money the seller spends creating customer value. For the sake of simplicity we shall assume that the amount of money a seller spends creating customer value in his offering is a valid measure of customer value. In future chapters we shall relax this assumption and explore how customer value is related to the seller's expense in creating customer value.

We shall assume that there is a one-to one correlation between customer value, U , and the amount of money, I , a seller invests in creating customer value. That is to say, when marketing profit is accepted as a function of the amount of customer value,

$$\text{Marketing Profit, } Z = aU - bU^2$$

and when the amount of the seller's investment, I , is substituted for the amount of customer value, U , then marketing profit, Z , becomes a function of the seller's dollar investment in creating customer value. Marketing profit is a function of the seller's investment, $Z = f(I)$, and marketing profit has a simple quadratic relationship with the amount of the seller's investment, I , in customer value

$$\text{Marketing Profit, } Z = aI - bI^2$$

where the values of the constants, a & b, are determined through market research.

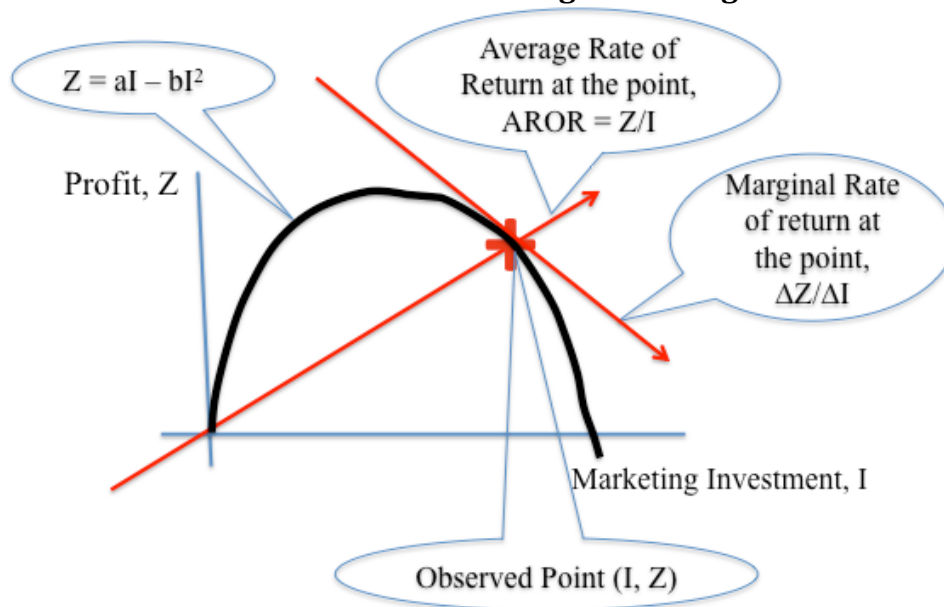
Defining Marketing Profit

Marketing profit is a function of the seller's investment in the amount of value a customer sees in the seller's offering. The quadratic relationship (Figure 1-4) between the amount of profit, Z, and the amount of the seller's investment, I, has several interesting and useful properties:

- 1) There is a optimal level of investment which maximizes the total amount of profit that can be generated from a offering.
- 2) When a seller invests too little in the offering, then the total amount of profit is less than could be obtained with the optimal investment.
- 3) When a seller invests too much in the offering, then the total amount of profit is less than could be obtained with the optimal investment.
- 4) Any point on the marketing profit function can be defined in terms of the investment's average rate of return, AROR, and the investment's marginal rate of return.

However, it is the marketing investment's average rate of return which provides the basis for the definition of marketing profit.

Figure 1-4: The Profit Function with Average and Marginal Rate of Returns



The marketing profit function decomposes into the marketing investment's average rate of return, AROR, and the size of the investment.

$$\text{Marketing Profit, } Z = aI - bI^2$$

$$\text{Marketing Profit, } Z = (a - bI) \times I$$

$$\text{Marketing Profit, } Z = \text{AROR} \times I$$

Marketing profit is the amount of financial gain, Z, the seller earns from a marketing investment's average rate of return, AROR, times the amount the seller has invested in the offering, I,

$$\text{Marketing Profit, } Z = (\text{investment's AROR}) \times (\text{investment, } I)$$

where,

$$\text{Average Rate of Return, AROR} = a - bI$$

The value of the marketing investment's average rate of return at any observed point of performance can be easily calculated as the ratio of the total profit to the total investment, $AROR = Z/I$. However, the value of the average rate of return is different for any observed level of investment.

In order to estimate the average rate of return for any particular level of marketing investment, it is necessary to know that the AROR is a linear function of the investment's size.

$$\text{Marketing Investment's Average Rate of Return, AROR} = a - bI$$

and to have estimates of the constants, a & b. That is to say, the rate at which a marketing investment creates marketing profit depends on the size of the investment. As a general rule the rate of return decreases (slows down) as the amount of the marketing investment increases.

Comparing Profit from a Marketing and a Financial Investment

The definition of a marketing profit as the financial gain from a marketing investment has a superficial similarity to the definition of a financial profit being the gain from a financial investment (Figure 1- 5).

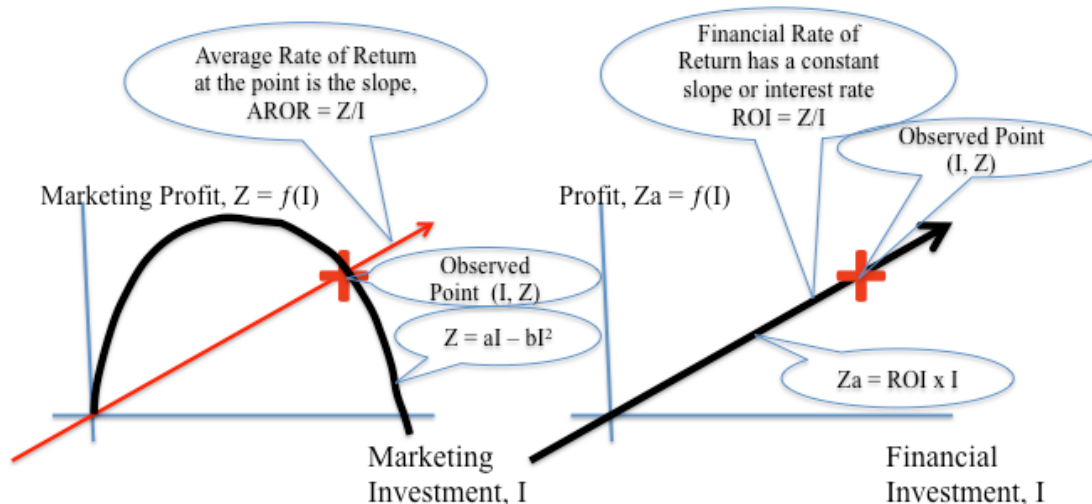
$$\text{Financial Profit, } Z_a = (\text{investment's interest rate, } i) \times (\text{investment, } I)$$

$$\text{Marketing profit, } Z = (\text{investment's average rate of return, AROR}) \times (\text{investment, } I)$$

However, the nature of a financial rate of return or an interest rate that is used in calculating financial profit is fundamentally different from the marketing investment's average rate of return. The profit function for a financial investment is represented as a direct relationship between profit and investment (Figure 1-5). The interest rate or average rate of return on a financial investment has a constant value and does not change when the investor changes the amount being invested.

The profit function for a marketing investment is represented as a quadratic relationship between profit and investment. The average rate of return from a marketing investment is function of the investment's size and the rate of return changes as the marketer changes the amount of investment. The different rates of return will be explored in more detail in the following chapters.

Figure 1-5: The Direct and the Quadratic Relationships



The profit function and the average rate of return for a marketing investment is dramatically different from the profit function and the interest rate associated with financial investments. Unfortunately, it is common for students to confuse the two and make the mistake of assuming that a marketing investment has a fixed rate of return and has a direct relationship with the size of the investment.

Examples of Calculating a Marketing Profit

Example Question 1)

You have observed that at the end of business quarter, the total marketing investment was $I = \$20,000$ and the total marketing profit was $Z = \$14,000$. What is the average rate of return on this particular level of marketing investment?

$$\text{Marketing Investment's AROR} = Z/I$$

$$\text{Marketing Investment's AROR} = \$20,000/\$14,000 = 70\%$$

Example Question 2)

Your accountant has provided you with the following information from last periods marketing performance. The amount of marketing investment was $I = \$30,000$ and the average rate of return on that level of investment was $\text{AROR} = 50\%$. What is the amount of marketing profit for the observed performance?

$$\text{Marketing Profit, } Z = \text{AVOR} \times \text{Investment, } I$$

$$\text{Marketing Profit, } Z = 50\% \times \$30,000 = \$15,000$$

Example Question 3)

Your accountant has provided you with the following information from last periods marketing performance. The amount of marketing investment was $I = \$30,000$ and the average rate of return on that level of investment was $\text{AROR} = 50\%$. You are forecasting the profit that would be generated when the investment level is changed to $I = \$32,000$. Is it conceptually correct to forecast the new level of marketing profit using the 50% rate of return found with the observed performance?

It is conceptually incorrect to use the observed rate of 50% to forecast the new level of marketing profit because average rate of return is a function of the investment size. The correct procedure is to have the market research department determine the linear function, $AVRO = a - bI$, and establish the correct rate of return for an investment of \$32,000.

Example Question 4)

Market research has provided you with the following equation that describes the average rate of return for marketing investments,

$$AROR = 1.1 - 0.02(\text{Investment in thousands, } I)$$

You are planning to increase the level of the marketing investment to $I = \$32$ thousand. What is the average rate of return at this level of investment?

$$AROR = 1.1 - 0.02(\text{Investment, } I)$$

$$AROR = 1.1 - 0.02(\$32 \text{ thousand}) = 46\%$$

What is the forecasted level of marketing profit to be returned from a marketing investment of \$32,000?

$$\text{Marketing Profit, } Z = AROR \times I$$

$$\text{Marketing Profit, } Z = (1.1 - 0.02I) \times \$32,000$$

$$\text{Marketing Profit, } Z = 0.46 \times \$32,000 = \$14,720$$

The above questions illustrate the importance of remembering that a marketing investment's rate of return is a function of the investment's size. In the above examples the average rate of return becomes slower as the amount of the investment increases.

Return on Inventory

Sometimes the concept of creating customer value in the seller's offering is abstract and it is difficult to visualize how the customer value. However, some elements of customer value are easier to visualize and to appreciate than others. The range of quality and the variety of inventory a retailer has on hand is a case in point. It is easier to appreciate how a larger and more varied selection of inventory enhances the retailer's offering to the buyer.

From a merchandizing stand point the variety of the products and the range of quality in the retailer's inventory makes an important contribution to the store's offering to the customer. It is easy to visualize the store's sales increasing as the seller provides more and more selection to his customers by increasing the breadth and depth of his inventory. Acquiring and holding more inventory is expensive and a larger variety of inventory requires a larger investment in inventory. It is easy to visualize the increase in gross profits being offset by the increase in the inventory cost. It is easy to visualize an optimal amount of inventory that will maximize total profit and when there is too much inventory being held, then total profits will be reduced.

The Rate of Return or Markup on Individual Items

Retailers consider their inventory an asset and they expect a return on that asset. The classic definition of markup on the cost, M_v , allows it to be interpreted as the rate of profit to be returned on the investment in that item of inventory. When a product costs the retailer $V = \$10$ per item and the selling price is $P = \$12$ per item, then the profit of $z = \$2$ per item. The markup represents a 20% rate of return on the seller's investment in inventory. For example a markup of $M_v = 20\%$ times the cost of the inventory, $V = \$10$, is equal to the profit, $z = \$2$, that is expected from the sale of that item of inventory.

Profit from Inventory investment, $z = (\text{Markup}, M_v) \times (\text{Cost of Inventory}, V)$

Profit from Inventory investment, $z = 20\% \times \$10 = \2

Profit from an investment in inventory can be thought of as the inventory's rate of return (markup percentage) times the cost of the investment. When dealing with a single item, then it is reasonable to assume that there is a direct relationship between the cost of the investment, V , and the amount of profit, z , being returned on the investment. A direct relationship between the cost of the investment, V , and the amount of profit, z , is one in which the ratio of profit to cost, z/V , or markup has a constant value.

When the ratio of the profit to the cost of the item is held constant, then there is a direct relationship between profit and investment. A direct relationship with a constant 20% markup or rate of return implies that profit increase from sale (investment) to sale (investment). However, it is only the gross profit that increases from sale to sale.

Increasing Gross Profit Does Not Necessarily Increase Total Profit

When each individual sale is profitable and as the number of sales increases then the gross profit increases. However, when the cost of making every additional sale is dependent on having had an increased selection and variety of available inventory, then the additional cost of the total investment in inventory can reduce the total profit. That is to say, the total profit from the total investment in inventory is not equal to the gross profit. The total profit from total investment in inventory is calculated as

Profit from Inventory Investment = Gross Profits – Total Cost of Holding Inventory

Increasing the retailer's investment in inventory in order to increase sales will increase gross profits. However, an increase in the selection of inventory to increase demand and gross profits often leads to the erroneous conclusion that maximizing profitable sales is equivalent to maximizing total marketing profit.

The relationship between the profit on an individual item, z , and the investment in that item, V , can be a direct relationship in which the markup percentage on the item, $M_v = z/V$, has a constant value. However, the relationship between the total profit, Z , and the total investment in inventory, I , is not a direct relationship and the

markup percentage of the total profit on the total amount of inventory, Z/I , does not have a constant value.

Average Rate of Return on Inventory

When amount and variety of retail inventory is considered to be an investment in the value the customer gains from the total shopping experience, then retail inventory is a marketing investment. When investment in retail inventory is treated as a marketing investment, then we assume the profit function is a concave relationship between total profit, Z , and the total inventory investment, I . The profit function is written as a quadratic equation,

$$\text{Profit from Inventory Investment, } Z = aI - bI^2$$

where the values of the constants, a & b , are determined by market research.

The profit function decomposes into the inventory investment's average rate of return, AROR, and the size of the investment, I .

$$\text{Profit from Inventory Investment, } Z = (a - bI) \times I$$

$$\text{Profit from Inventory Investment, } Z = (\text{AROR}) \times (\text{Investment, } I)$$

The average rate of return on inventory, AROR, is a linear function of the investment's size.

$$\text{Average Rate of Return, } \text{AROR} = (a - bI)$$

As the amount of investment in inventory increases, then the rate at which profit is generated from the investment decreases. The total profit generated by the investment in inventory increases with the initial increases in inventory and eventually decreases as the amount of investment is increased past the optimal level of inventory (Figure 1-6).

An Example of Inventory as a Marketing Investment

The average rate at which profit is generated from inventory is dependent of the size of the investment and investing too much can result in a reduction of total profit. That is to say, the average rate of return, AROR, is a function of the investment's size.

For example the market research department has determined that the average rate of return for a particular tourist kiosk can be described with the function

$$\text{AROR} = a - bI$$

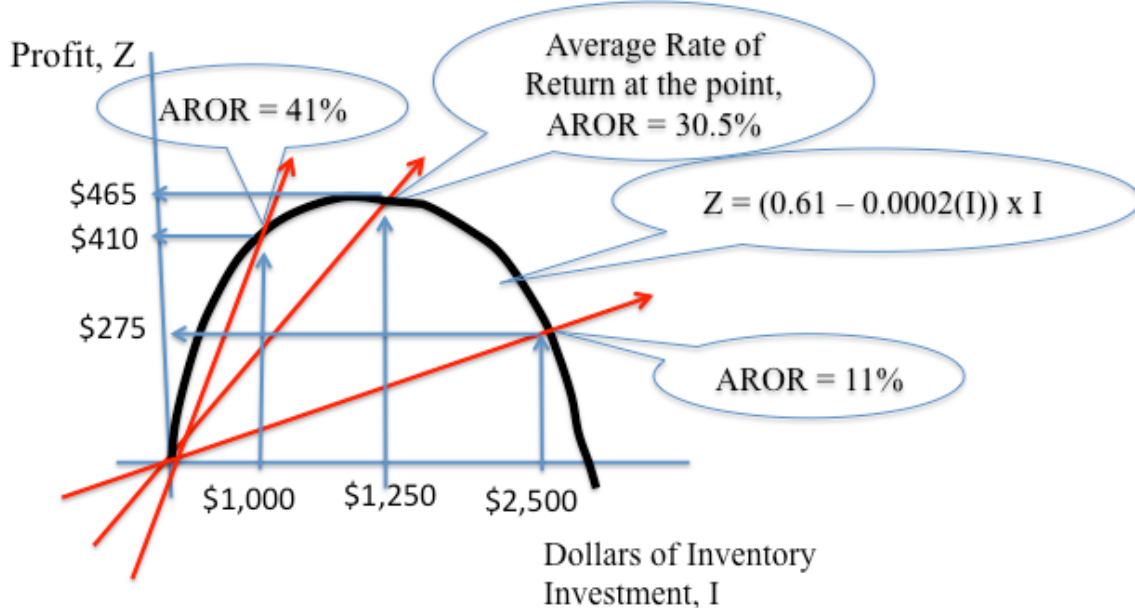
The values of the constants, a & b , are given and the function for AROR (Figure 1-6) is written as

$$\text{AROR} = 0.61 - 0.0002(I)$$

The average rate at which profit is being returned on the inventory investment when the amount of investment is $I = \$1,000$ is calculated as

$$\text{AROR} = 0.61 - 0.0002(\$1,000) = 41\%$$

Figure 1-6: Example of Inventory as a Marketing Investment



When the amount of investment in the seller's inventory is $I = \$1,000$, then the amount of profit, Z , generated on the \$1,000 investment in inventory, I , is

$$\begin{aligned} Z &= (a - bI) \times I \\ Z &= (0.61 - 0.0002(\$1,000)) \times \$1,000 \\ Z &= (0.61 - 0.0002(\$1,000)) \times \$1,000 = \$410 \\ Z &= \text{AROR} \times \$1,000 = \$410 \end{aligned}$$

When the investment in inventory is increased to $I = \$2,500$, then the rate at which profit is being returned on the investment is reduced to

$$\text{AROR} = 0.61 - 0.0002(\$2,500) = 11\%$$

When the amount of investment in the seller's inventory is increased to $I = \$2,500$, then the amount of profit generated on the \$2,500 investment in inventory is reduced to

$$\begin{aligned} Z &= (0.61 - 0.0002(\$2,500)) \times \$2,500 \\ Z &= (0.61 - 0.0002(\$2,500)) \times \$2,500 = \$275 \end{aligned}$$

The size of the investment determines the investment's average rate of return. The average rate of return at a particular level of investment determines the amount of profit earned at that level of investment.

In future chapters we shall explore the calculations for the optimal level of inventory investment. In this chapter we shall note that the optimal level of inventory for the Tourist Kiosk is \$1,525 and an optimal investment generates a maximum of profit of $Z = \$465$ with an AROR = 30.5%.

The kiosk example illustrated in Figure 1-6 demonstrates that the average rate of return of 30.5% at the optimal level of profit is not the highest rate of return even though it produces the maximum amount of total profit. The average rate of return is always becoming slower as the amount of investment increases. The total amount of profit being returned from an increase in investment can increase or decrease depending on the level of investment being greater or less than the optimal value. These complex phenomena will be explored in more detail in later chapters.

Forecasting profits from a marketing investment is clearly more complicated than forecasting profit from a savings account with a fixed interest rate. The reason for the extra complexity is the fact that the AROR is a function of the inventory level and the rate of return varies with the size of the investment in inventory.

Managing the profit being returned from a marketing investment is very different from managing the profit from a financial investment. The crucial difference is that marketing investments have the potential for reduced profits due to over investment, whereas increases in financial investments by the individual investor always generate greater profits for the investor.