

MARKETING STRATEGY AND ITS EFFECT ON RETAIL SITE:
A CASE STUDY OF THE VANCOUVER GASOLINE MARKET

by

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We accept this thesis as conforming to the
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ABSTRACT

The thesis examines one aspect of urban structure -- namely the quality of retail site. The specific research hypothesis is that different marketing strategies can cause differences in site quality. The gasoline service station industry of Vancouver, British Columbia was chosen as a case study for purposes of testing the hypothesis. From the marketing literature it was shown that there exists two distinct strategies for marketing gasoline: non-price competition as practiced by the major oil companies and price competition as practiced by the small independents. A quality rating schedule, using both variables internal to the site itself (micro variables) and variables based on the surrounding socio-economic environment (macro variables), was devised as a surrogate measure of site quality. Gallonage performance of a station was used as a direct measure of site quality. For a sample of major company stations the correlations between site rating scores and gallonage were very high. The quality rating schedule also possessed high predictive ability for gallonage. It was

demonstrated that stations of high quality (in terms of the site rating score) pump the most gasoline. In contrast, correlations between the site rating scores and gallonage for the population of price-cutters was very low. Since the average independent station pumps twice as much gasoline as the average major station, it was apparent that the site rating instrument was not a good surrogate measure of quality for the price-cutter stations. It is concluded that explanation for this discrepancy in gallonage and site scores is attributable to the differences in marketing strategy. Quality requirements for successful company service stations are different from the quality requirements of successful price-cutter stations. This fact is important to both industrial and urban planners. For example, in Vancouver the City Council embarked on an explicit plan of reducing the number of service stations. However, its actions were made without a full understanding of the different corporate strategies and have prevented what was an already declining population of stations.

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CHAPTER 1

RETAIL SITE QUALITY: AN INTRODUCTION

The urban environment is an interesting and compelling field of study. To date, much of the research done by urban geographers has been largely theoretical; devoid of real world conditions upon which to base private and public decisions. In this thesis it is argued that a more complete understanding of urban structure can be achieved if an understanding and an appreciation of the individual sites that make up the urban mosaic is first attained. It would appear more profitable to start at the lowest common denominator, site, than to begin with an aggregated pattern of land use. A "site" is here defined as a functional unit of urban space.

The aim of this thesis is to examine one specific aspect of urban structure -- namely the quality of retail site.

The study of site is a broad and complex topic. The literature has dealt with site under three categories: quality, type, and network. The quality aspects of site are most evident in the retailing segment of the urban environment, for it is quality which determines the ultimate performance of any retail establishment. Retail sites of poor quality do not command high sales volumes nor are they likely to maintain themselves

in the market place for a long period of time. Although type and network of site are as important as quality in forming the urban landscape, they will not be dealt with at length in this thesis.

The approach taken here is in contrast to most work done in urban economic geography. A great many geographers have looked at broad urban patterns derived from highly aggregated social and economic data to gain some understanding of the city; for example Burgess (1925). Others, like Berry (1963) who study retail location, industrial location, or spatial theory have used the patterns created by various forms of land use as their basic data. A still smaller group, for example Applebaum and Cohen (1961), have concentrated their efforts on individual retail sites and use as their basic data the attributes of the site itself as well as other pertinent socio-economic information. The present thesis approximates the last approach more closely than the former two, but deals in greater depth with the actual site attributes.

Research Hypothesis

For the most part, the quality of retail site is determined by the entrepreneur who selects, builds, or creates the site for a particular function. Claus (1969) in a study on the dynamics of gasoline service stations in California, demonstrated that the most capable entrepreneurs are able to select the highest quality of retail sites. In Claus' study, differences in marketing strategy did not enter as an intervening variable in the research design, and were therefore not considered in the analysis of site quality. This was accomplished by having a sample of stations

which utilized a single marketing strategy.

In an endeavor to further the understanding of retail site quality this thesis proposes the research hypothesis that different marketing strategies can cause differences in site quality.

Method of Approach

The gasoline service station industry of Vancouver has been chosen as a case study for purposes of testing the research hypothesis. Vancouver represents an area of 44 square miles and a population of 410,000. Its land area is almost fully developed and, as such, the city exhibits a fairly stable urban environment. Vancouver has experienced a long and varied history of oil industry participation; in fact, it was here in 1907 on Smythe Street that the first gasoline service station in the world was erected (Imperial Oil, 1967, p. 1).¹

From the marketing literature it has been demonstrated that the North American oil industry has developed two distinct strategies for marketing gasoline. These are non-price competition as practiced by the major oil companies and price competition as employed by small independents. The different marketing strategies demand different qualities of retail site. For example, because independent dealers use price instead of convenience and service as a means of attracting a certain segment of the market, they do not need to provide the facilities and location that the

¹The first gasoline station in the United States was also erected in 1907 in St. Louis (Cassady & Jones, 1951, p. 87).

major companies offer. The goodness of facilities and location is regarded as surrogate measures of site quality.

To test the hypothesis a sample of major company stations and the population of independent outlets were selected for the experiment. A quality rating schedule was devised and the scores obtained from it were correlated against station gallonage. Gallonage performance of a station is regarded as the best direct measure of site quality. The results revealed a strong positive correlation between major company rating scores and gallonage. This established the fact that the quality rating schedule is capable of good gallonage prediction. When the tests were applied to the price-cutters, correlations between the rating scores and gallonage were very low. The conclusion reached was that the quality requirements for price-cutter stations are different from the quality requirements for major company stations.

Outline

A review of the pertinent literature on site and city structure is presented in Chapter 2. Chapter 3 discusses at length the various aspects of corporate strategy as well as some of their implications. The actual experiment and results of the Vancouver case study are presented in Chapter 4. Chapter 5 sums up the case study and draws some interesting conclusions about the oil industry and the City of Vancouver.

CHAPTER 2

SITE AND CITY STRUCTURE

It seems only reasonable that in order to fully understand the structure of the urban environment, one must first understand the operating units that make up the structure. In this thesis the smallest components or smallest functional units of space in a city are designated as sites.

This approach to urban analysis has not been widely used in the past although the principles on which it is based have all been mentioned in the geographic literature at one time or another. For the most part, geographers have tended to aggregate their data rather than study the common characteristics of smaller spatial units. The popular method of research on urban structure has been to discover some spatial organization among generalized forms of land use. Little energy has been spent on the analysis of individual sites themselves, even though the term and concept of site is well known to geographers.

The concept of 'site' has been a central element in American urban geography for several decades. The genesis of this concept in

the field of geography can be traced back to the French geographer, Blanchard (1922) who distinguished between the general elements of situation and the specific characteristics of site. To him, site factors were "purely local traits of the landscape" (Berry & Horton, 1970, p. 15). Another French geographer, Max Sorre (1952), expanded upon Blanchard's basic ideas, but was mainly concerned with the influence of situation in the urban context. Site, he believed, referred only to the natural morphological landscape. His scale of discussion on site related to the city area as a whole. Following closely on this theme, Dickinson (1959) stated that, ". . . site embraces the precise features of the terrain on which the settlement began and over which it spread" (p. 12).

Implicit in the early writings on site is the idea that "situation" somehow involves the human element while "site" is relegated to a purely physical context. Also contained in these works is the bias of treating site only on a city or settlement wide scale. Broek (1965), however, says that both site and situation are very broad concepts and can be applicable at many scales of activity. His definition of site is somewhat less restrictive than previous ones: "Site . . . means the location of a given place with its local internal features or resources" (p. 30).

The term "site" is commonly used in contemporary geographic literature when referring to land areas of much smaller size than a city. This is especially true in studies dealing with urban land economics and retail location (see Berry, 1963; Alonso, 1964; Murphy, 1966; Huff, 1966; Garner, 1967; Berry & Horton, 1970). Here the scale of "site" is usually

reduced to the size of a building lot or to the building itself. In fact, Garner (1967) is quite emphatic that site not only contains such factors as shape, size, topography and geology, sewers, lighting, etc., but also includes the "capital committed in the form of buildings"(pp. 100-101). In discussions on the problems of selecting the proper retail site, most geographers treat the building as intrinsic to the site itself (see Proudfoot, 1938; Canoyer, 1946; Kelley, 1955; Nelson, 1958; Applebaum, 1968). In other words, site has come to represent not only a plot of land of specific size but also the buildings or structures erected upon that land.

This reinterpretation of the concept of site varies only slightly from that originally proposed by Blanchard (1922). Although site has been extended to cover not only the natural morphological landscape but also the humanly constructed landscape, the term still retains its original meaning of referring to specifically physical attributes. Along with this, the scale of the term site has also been reduced somewhat.

Acceptance of the common usage of the term site demands the realization that "a city . . . is divided into many parcels of land, each of which may be called a 'site.' Most of these sites have structural improvements designed for some particular use"(Lowry, 1970, p. 499).

Site can therefore be thought of as the basic building block in the urban fabric. It is the arrangement or spatial pattern of these basic building blocks that is called the structure of the city. Since no site is ever isolated from all other sites, the type of linkage between sites is

critical. It is often these external linkages between sites, i.e. transportation and communication, that determine the alignment and positioning of the various sites themselves (Rannells, 1956). Linkage here is defined as, "a relationship between establishments characterized by recurrent interaction which require movement of persons or of goods or the exchange of information" (Rannells, 1956, p. 19). Nelson (1969) suggests that "urban transportation (also communication) not only laces the urban structure together, but it also profoundly affects the arrangement and function of elements in the structure of the city" (p. 200).

It is the shape or the three-dimensional manifestation of the site itself which is called the form of the city. This is usually conveyed by the size, style, and architecture of the buildings and lots which make up individual sites. One example of sites having essentially the same function (housing) but radically different form is the single family dwelling and the high rise apartment building. The difference in form here is quite obvious, but sometimes the most interesting differences in form are the most subtle in nature.

Although geographers are aware of the basic interdependence between form and structure, little work has been done in the way of understanding their exact relationship. The processes involved in altering or creating both aspects of the environment can be very complex. Structure when set by the city can in fact determine form. For example, the high rise development of apartments on the Golden Crescent in Vancouver is a result of a conscious city policy to restrict heavy density

zoning to one area. This can be contrasted to the San Francisco waterfront where building heights were limited by zoning regulations. Municipal and fire codes, as well as mortgage arrangements, also play a part in determining city form and structure.

Even though every site is unique, some commonality must be established among sites before meaningful research can proceed. Individual sites have usually been examined under three categories: quality, type, and network of site.

Quality

One of the most obvious and most important features about site is quality. This is especially true for retail sites because it is site quality that determines the ultimate performance of any retail establishment. Performance here is measured in terms of volume sales and viable economic life of the site. In fact, it is site quality that often determines the life and death of a business enterprise.

Sites performing the same function and maintaining the same threshold, both in size and kind, are unlikely to do the same volume of business. This is because of qualitative differences between sites.

Applebaum (1968) illustrates this point of view by saying that:

Where different firms offer a similar choice of goods, prices, and services -- as is typically the case with supermarkets -- and where two or more firms compete in approximately similar locations for the same source of trade, the stores that offer the best retailing facilities can expect to outperform their inferior competitors (p. 49).

Although geographic literature on the topic of retail site quality is sparse, most writers who deal with store location make frequent mention of the importance of having superior facilities. Nelson (1958), for example, believes that "location is not the only factor determining the success of the operation or the business volume" (p. 141). A great many other factors such as physical comfort, convenience, reputation, character of service, attractiveness, etc. are of equal importance in the performance of a site. Martineau (1958a) says that "regardless of ability to pay, all shoppers seek stores whose total image is acceptable and appealing to them individually" (p. 49). If this is true, then shoppers must recognize some qualitative difference between retail outlets.

Huff (1966) a major proponent of the use of gravity models in approximating optimum retail locations, has pointed out that such a normative approach is insufficient because it fails to consider the qualitative aspects of retail site.

. . . the model does not consider important questions pertaining to the site at a potential location. It is obvious that there are a number of important factors related to the site itself that can influence the volume of sales that can be expected from a given location. Visibility and accessibility, as well as the nature and condition of adjacent property, have a bearing on the sales that can be expected. Therefore, it is important that supplemental techniques for appraising the site be used in conjunction with the general sales estimate afforded by the model. Generally such techniques are of a qualitative character and thus, again, human judgement plays an important role in arriving at an adjusted sales estimate (pp. 302-303).

Other references to site quality in geography can be found in Murphy (1966, p. 361) when he talks about the quality rating of manufacturing

sites. Pred (1967, 1969) also makes use of the concept of site quality in his formulation of the "behavioral matrix." According to Pred, locational actors who possess the most information and have the best ability to act on that information will choose the best quality of site for a specific economic activity.

Garner (1966) in his discussion on "Rent and Site Utility" points out that although relative location of a site within the city is a prime consideration, ". . . more important, however, from the retailing point of view, is the 'physical quality' of the site" (p. 100). He says that site productivity is subject to "internal site variations" (p. 101). The topic of internal variation will be examined at a later point.

The ideas proposed by Garner come from his realization that both consumer behavior (Engel, et al, 1968) and the behavior of the entrepreneur (Pred, 1967) are more complex than the postulates of central place imply. Consumer behavior is of particular importance in retailing because consumers can be linked to particular establishments for the purchase of a given good according to their preference and position in the various strata of the urban market (Garner, 1966, pp. 115-116).

Garner also claims that:

Establishments are not exactly similar but are differentiated from each other in many subtle ways. Qualitative differences whether real or fancied in the eyes of the consumer, arise from a combination of (a) differences in the product sold, and (b) differences in the condition surrounding the sale (p. 116).

According to Garner qualitative differences in retail site are evidenced via such attributes as the general tone of the store, personal service, reputation, physical facilities available, personal attraction of the surroundings, convenience, etc. (p. 117).

Most writers would seem to conclude that the best performance in the market place is accomplished by sites of highest quality. Site quality could then be defined as the ability of a retail site to perform the function for which it was designed, measured in terms of facilities and layout of the site itself (Claus & Rothwell, 1970, p. 86).

Most obviously, the difficulty with empirical research of this type lies in the isolation and measurement of variables to gauge site quality. Claus (1969) demonstrated that this could be done fairly accurately for gasoline service stations and more will be mentioned about this later. Other research of this type is presently being carried on for doctors' offices (Bottomley, 1970) and housing (Hayward, 1970), but a great deal more work needs to be done in order that comparisons between different types of sites can be accomplished.

It cannot be emphasized too strongly that the success or failure of a particular retail establishment is largely a function of site quality. If we are to understand the structure of the urban environment, we must first know the process involved in determining the existence or non-existence of the component parts -- in this case the individual retail sites.

Type

A great deal of geographic literature exists on the classification of urban sites according to type. This is especially true for retail sites where the general practice has been to aggregate all business sites into one type on the basis of their position in the urban structure. Here the type of site is categorized according to structure, rather than determining structure by the arrangement of various types of site. Although the results by either method would appear to be the same, the latter approach would seem to be the most flexible.

The first major geographic effort in typology of retail sites was done by Proudfoot (1937) who used the criteria of size of agglomeration, size of establishment, and type of customer, to establish five categories of retail "structure:" (1) C.B.D., (2) outlying business center, (3) principal business thoroughfare, (4) neighborhood business street, and (5) isolated store cluster. Implicit in Proudfoot's categorization of business types is the mode of transportation used in reaching the establishment.

Canoyer (1946) made explicit use of mode of transportation in her classification of retail "locations." Her five categories are very similar to those of Proudfoot: (1) central shopping district, (2) sub-centers, (3) string streets, (4) neighborhoods, (5) isolated stores.

Although Kelley (1956) employs threshold size, range, and transportation in establishing a fairly detailed description of business

"structure" his model is based on the idea of cost minimization. People will always shop at the place of least transfer cost for a specific good. Kelley is one of many writers to introduce the idea of planned and unplanned shopping centers into the type of retail sites.

Nelson (1958) takes a slightly different stance and claims that there are two types of retail "locations:" (1) generative, to which the customer is directly attracted from his place of residence, and (2) susceptient, to which the customer is impulsively or coincidentally attracted while moving about the area where the retail store is located. At the basis of Nelson's typology is still the idea of some form of linkage between different sites.

Probably the most well known work on types of retail sites has come from the Chicago school led by Brian Berry (see Berry, 1963; Berry & Tennant, 1965; Simmons, 1964, 1966). Using the basic processes of central place theory, Berry proposes a hierarchical structuring of intra-urban retail centers similar to that used to describe urban settlements and their hinterland. Unable to account for highway-oriented or specialized retailing strictly by the use of central place axioms, Berry modified his general model to make them fit into the "structure" (Figure 1). Central to Berry's hierarchical ordering of retail centers are the concepts of range and threshold. Range is the distance that a consumer will travel in order to purchase goods at a retail outlet and threshold is defined as the minimum sales volume required for the initial operation or the condition of entry of any retail business type. (It should

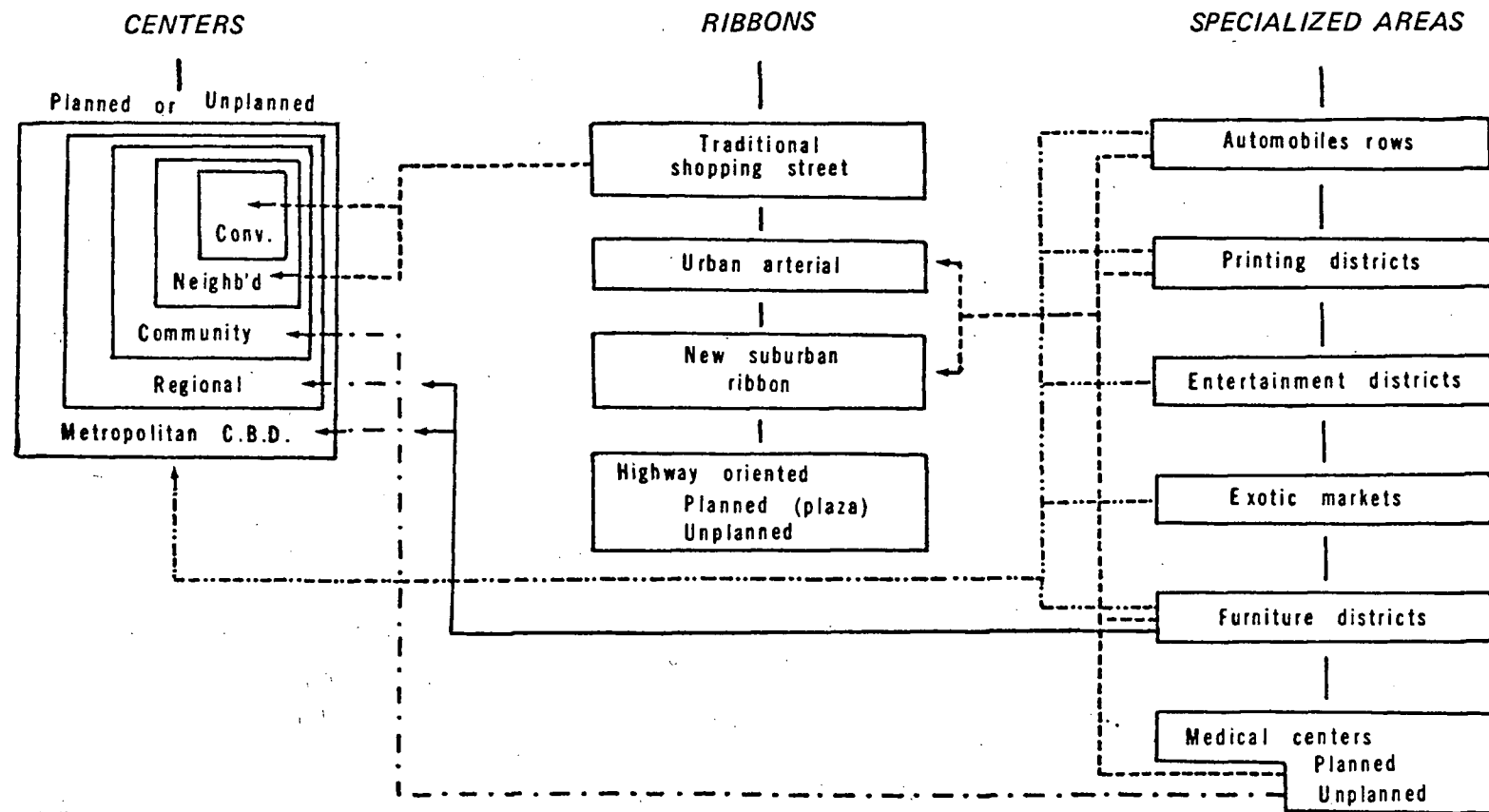


FIGURE 1: The structure of intra-urban business and commerce.
Source: Berry & Horton, 1970, p. 457.

be noted that business type, defined by the S.I.C. index, and type of site are not synonymous.) According to the model "all business types are ordered according to threshold size" (Garner, 1966, p. 104), therefore the enterprise with the highest threshold will demand the most accessible spot in the city and will, of course, be at the top of the hierarchy.

As Garner (1966) points out, however, the real world patterns are considerably more complex than this deterministic model suggests (p. 144). One assumption that cannot be met by the model is that retail outlets performing the same function have identical thresholds: identical not only in size but also in kind of product. Garner uses the example of bars that may range from a chic cocktail lounge to the proverbial "joint." Although serving essentially the same function they are not likely to have the same threshold; nor, in fact, do they offer the same product.

Rather than grouping all bars into one class of business type under the available system of classification, it would be more realistic to consider them as offering different goods and consequently comprising different business types. A similar argument can be extended to include the classification of all other business types in the nucleation (p. 116).

.....
Once the assumption of homogeneity within any business type is relaxed to include the notion of product differentiation, it is apparent that a simple ranking of business types by threshold size is no longer possible . . . instead . . . each business type will be associated with a range of thresholds rather than just a unique threshold size as implied in the operational definitions of threshold used in the current literature (p. 118).

The importance of product differentiation in retail sites has been noted by many scholars. Kelley (1956), for instance, points out the difference between product thresholds for shopping centers and department

stores (p. 415). This principal is also firmly established in geographic literature by the many examples of corner grocery stores which survive on convenience goods and the larger supermarkets which sell a much wider range of products.

The most suitable classification of urban retail sites would seem to be one which dealt with individual retail functions. In other words, a typology might be made for hotel sites, laundromat sites, doctors' offices, etc. The most salient features on which to base this typology (as suggested by the literature) appear to be the dominant form and structure of transportation that is used to frequent the site and the kind and size of threshold of the site.

Transportation mode as a factor in determining type of site has been used implicitly or explicitly by Proudfoot (1937), Canoyer (1946), Kelley (1956), Nelson (1958), Horton (1968), and to some extent Berry (1963). Rannells (1956) says that it is the number and type of linkages that are made between sites that in effect determine city structure. If this is true it is perhaps wise to classify type of site by transportation mode.

The role of the threshold in type of site is not clear although some definite relationship appears to exist. Perhaps it is the mode of transportation that determines threshold; but as yet this has not been empirically tested.

An excellent example of classification of site by type comes

from the oil industry. Their five types of service stations (freeway, mainstreet, shopping center, neighborhood, downtown) are distinguished on the basis of threshold and transportation. The obvious distinction by transportation is due to the fact that stations are designed to accommodate a particular kind of traffic flow. The layout, facilities, and product mix of the neighborhood station would not work on the freeway. It is interesting to note here how the transportation artery can also effect the form of the site.

Although all service stations sell gasoline they also derive income from other sources. The freeway station, for example, may need the same size of threshold as the neighborhood station, but usually receives its income from the sale of gasoline and related products, while one-half of the neighborhood station's income may be from servicing and repairing automobiles. This difference in kind of threshold is generally true for all types of service station sites.

The present methods of classifying retail establishments has already shown that there is a strong affinity among certain types of retail site. It is hoped that by using the method of typing sites according to threshold and transportation that even finer differentiations in retail structure can be observed. However, more work on this topic still needs to be done. "Refinements are needed in the classification of business types and a more thorough appraisal of the threshold concept and product differentiation between establishments must be developed" (Garner, 1967, p. 351). More attention must also be paid to the mode of transportation

that is used to gain access to the site.

Network

Networks¹ of retail sites (although aggregated to a much larger scale) has received a great deal of attention from geographers, starting with Christaller's (1933) work on central place theory and being pursued aggressively by others including Berry (1967) and his colleagues.

Although this area has been worked in great depth, one of the main drawbacks to this approach is that it is in the category of being normative geography (Wolpert, 1964). As such, it has little practical application when applied to the scale of individual sites. Even at the scale of "retail centers" within cities, this approach is not adequate enough to describe the real world situation (Berry, 1959, p. 154).

Geographic research on network of sites for a single retail type has mainly taken the form of delineation of trade areas for various retail outlets or the appraisal of the spatial dispersion of competitive sites. Both of these topics demand a spatial study of the existing sites of a particular retail type.

Canoyer (1946) regards competition as the second most important factor, behind traffic density, in determining the successful selection of a retail site. She states that this is especially true in picking gasoline service stations that will have a high sales volume (p. 43). In her analysis of site selection methods, much time is devoted to examining the location

¹Network here should not be confused with graph theory.

and quality of similar types of retail sites surrounding a prospective location.

Kelley (1955) also makes special mention of the geographic dispersion of competitive outlets as an important criteria in the selection of retail sites. Similarly, this point is developed extensively by Kornblau and Baker (1968) who state that ". . . the quantity, quality, and location of competition (present and prospective) affect the performance of existing stores They are also vital elements in planning a store location strategy for an extensive market area" (p. 129). Huff (1966) in his model for predicting optimum retail location also takes the location, quantity, and quality of competitive firms into account.

An interesting aspect of site network is mentioned by Alderson and Shapiro (1964), who explain that a firm may choose to build an "optimal network of sites." This is done in order to make efficient use of widespread advertising and credit cards. The general plan in this move seems to be the strategic placement of sites throughout the whole market area. Kornblau and Baker (1968) are quick to point out that this practice is typical of certain types of chain stores. Although such a network system has not been studied by geographers, the returns from research on this topic would seem to be of great help in understanding the overall urban structure. A knowledge of the processes involved in the functioning of a complex network of retail sites would undoubtedly add a great deal to our understanding of linkages in the city. In a case like this, there are linkages between the individual sites and the firm that owns them,

linkages between consumers and a single site, and linkages of consumers to many sites.

It is hoped that some research into this topic will be done in order to establish the feasibility of such an approach.

Quality Rating of Service Station Sites

In order to test the hypothesis that different marketing strategies can cause differences in site quality, an instrument to measure site quality must be established. Since the gasoline service station industry has been chosen as a case study in which to test the hypothesis, the remainder of this chapter will deal with the development of an instrument to rate the quality of service station sites.²

A site rating instrument can be defined as an instrument designed to give a quantitative measure of the performance of a unit of real estate with respect to some given criterion. They are frequently used in the field of real estate appraisal where the criterion measure used is usually market value. There is no reason however why market value should be used and any measure can serve as the criterion. The development of site rating instruments within the field of real estate was a natural development of the procedures of appraisal commonly used, being in essence formalized versions of these methods. Traditional methods of appraisal have attempted to isolate those factors which were considered to be the most significant in affecting the performance of the unit under consideration

²Much of the following material has been taken from a forthcoming article by Claus, Rothwell, & Bottomley (1971).

and to estimate in the light of these factors the performance of the unit. Excellent examples of such methods can be found in Carb (1968) and Drennan (1968). The major drawback of these methods is that they are extremely time consuming due to the large amounts of data that must be collected.

In an attempt to significantly decrease the amount of time needed to perform an appraisal various writers designed site rating schedules. Canoyer (1946, pp. 21-22) was one of the first to do this. A schedule developed by Brick (1968) concerned itself with the appraisal of gasoline service stations and in it he presented eleven factors as being of major importance (Figure 2). The appraiser rates the station under consideration on a five point linear scale with respect to the eleven variables. These variables are then assigned differential weightings, e.g. visibility 7 per cent, adequacy of size and shape 10 per cent, and a total percentage score is thus obtained for the station by summing across the eleven variables. Such a schedule can only be useful when it is accompanied with a comprehensive site rating manual in which the important factors are discussed in order to provide criteria for the assignment of a station to one of the five possible scores on each variable. Brick does not state what his criterion measure is, although implicitly he suggests that it is average monthly gallonage pumped by the station. This schedule has been in common use among site developers for some time and formed the basis of the instrument used in the California gasoline study (Claus, 1969).

Claus made two modifications to Brick's original instrument.

| Weighted % | Factor | Excellent (100) | Above Ave. (80) | Good (60) | Below Ave. (40) | Poor (20) |
|---------------|---|--------------------|--------------------|--------------|--------------------|--------------|
| 10 | Adequacy of size | 10 | 8 | 6 | 4 | 2 |
| 10 | Neighborhood business potential | 10 | 8 | 6 | 4 | 2 |
| 9 | Grade of street and highway | 9 | 7.2 | 5.4 | 3.6 | 1.8 |
| 7 | Visibility from roadway | 7 | 5.6 | 4.2 | 2.8 | 1.4 |
| 11 | Compatibility of traffic flow | 11 | 8.8 | 6.6 | 4.4 | 2.2 |
| 6 | Transient business potential | 6 | 4.8 | 3.6 | 2.4 | 1.2 |
| 4 | Zoning | 4 | 3.2 | 2.4 | 1.6 | .8 |
| 5 | Ease of approach | 5 | 4 | 3 | 2 | 1 |
| 18 | Economic balance (including adequacy of buildings) | 18 | 14.4 | 10.8 | 7.2 | 3.6 |
| 13 | Stability of area | 13 | 10.4 | 7.8 | 5.2 | 2.6 |
| 7 | Future trends of area | 7 | 5.6 | 4.2 | 2.8 | 1.4 |
| 100 | Total point score -- 50.8 rating - below average | | | | | |

FIGURE 2: Illustration of Brick's Site Rating Schedule
(Source: Brick, 1968)

The first was to exclude the zoning and ease of access factors and substitute in their place the monopolistic and strategic factors. This modification had been made initially by many of the site developers using the schedule in California. The second modification was more basic in nature and was to divide the eleven factors into two groups, one group termed the micro-layout subgroup and the other, the macro-location subgroup (Figure 3). This split recognizes that those factors that are intrinsic to the site are of a different nature than the factors in the macro subgroup. That both sets of factors influence the performance of a retail site was recognized by Kelley (1955, p. 429, see Figure 4) and by Huff (1966), who says, "It is obvious that there are a number of important factors related to the site itself that can influence the volume of sales that can be expected from a given location. Visibility and accessibility, as well as the nature and condition of adjacent property, have a bearing on the sales that can be expected" (p. 302). This point is well taken, but it is asserted here that the two subgroups of factors are surrogates for two different types of performance. The micro subgroups are seen as surrogates of gallonage whereas the macro factors are seen as surrogates of longevity, i.e. the propensity of a gasoline service station to remain in business. These concepts have been discussed by Claus and Rothwell (1970) as follows:

The abbreviations INSV and EXSV represent the terms internal site variable and external site variable respectively. In an earlier book of this series, Spatial Dynamics of Gasoline Service Stations, the phrase "micro" was used to convey the concept of INSV and "macro" to signify the concept of EXSV. Both "micro" and INSV represent the idea that certain variables internal to, or intrinsic in, the site itself influence

| Rating Variables | 100% Excellent | 80% Above Ave. | 60% Good | 40% Below Ave. | 20% Poor |
|---|-------------------|-------------------|-------------|-------------------|-------------|
| <u>MICRO LAYOUT</u> | | | | | |
| Adequacy of size and shape | 10 | 8 | 6 | 4 | 2 |
| Visibility | 7 | 5.6 | 4.2 | 2.8 | 1.4 |
| Street and highway grades | 9 | 7.2 | 5.4 | 3.6 | 1.8 |
| Compatability to traffic | 11 | 8.8 | 6.6 | 4.4 | 2.2 |
| Economic balance (including adequacy of buildings) | 18 | 14.4 | 10.8 | 7.2 | 3.6 |
| <u>MACRO LAYOUT</u> | | | | | |
| Neighborhood business potential | 10 | 8 | 6 | 4 | 2 |
| Transient business potential | 6 | 4.8 | 3.6 | 2.4 | 1.2 |
| Monopolistic factor | 4 | 3.2 | 2.4 | 1.6 | .8 |
| Stability of area | 13 | 10.4 | 7.8 | 5.2 | 2.6 |
| Future trends of area | 7 | 5.6 | 4.2 | 2.8 | 1.4 |
| Strategic factor | 5 | 4 | 3 | 2 | 1 |

FIGURE 3: Illustration of Claus' Site Rating Schedule
(Source: Claus, 1969)

| Factors | Ranking of Site | | | | |
|---|-----------------|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| <p>A. REGIONAL FACTORS</p> <p>Population</p> <p> within 15 minutes</p> <p> 16-30 minutes</p> <p>Purchasing power</p> <p> amount and stability</p> <p> distribution</p> <p>Growth of population</p> <p> amount</p> <p> degree</p> <p>Competition</p> <p> amount</p> <p> quality</p> <p>B. SITE FACTORS</p> <p>Size of tract</p> <p> minimum size</p> <p> undivided</p> <p> buffer area</p> <p>Access and egress</p> <p> primary roads</p> <p> secondary roads</p> <p>Traffic</p> <p> present pattern</p> <p> future pattern</p> <p>Parking</p> <p> amount</p> <p> nearness to stores</p> <p>Cost</p> <p> acquisition</p> <p> maintenance</p> <p>C. SITE FACTORS</p> <p>Terrain conditions</p> <p> grading</p> <p> subsoil conditions</p> <p>Utilities</p> <p> proximity</p> <p>Expansion-Environment</p> <p> expansion</p> <p> environment</p> | | | | | |

FIGURE 4: Illustration of Kelley's Site Rating Schedule
(Source: Kelley, 1955)

the performance of the site. Similarly, "macro" and EXSV convey the thought that variables associated with the environs, i.e. surrounding socio-economic climate, determine the economic viability of a specific site. INSV is concerned with the site itself, while EXSV is concerned with the surrounding area. These two concepts may be likened to the phrase "site and situation" which has gained popularity in several schools of geography, but for our purposes contains connotations that are not altogether compatible with our present research (p. 27).

The actual application and use of the site rating instrument in the Vancouver market will be discussed later under the methods of analysis. It has been introduced at this point as supporting evidence on the importance of site quality in examining urban structure.

CHAPTER 3

THE FIRM AND FIRM STRATEGY

Nature of the Modern Firm

The elements responsible for making positive decisions concerning the landscape are very complicated. The decision-maker can be a small business man, a home owner, a city council, a professional organization, or a business firm. Even within organizations themselves, there exists both individual and collective decision-makers (Cyert & March, 1963; Simon, 1964b). As Form (1954) points out, "While they (business firms) may not consume the greatest quantities of land, they do purchase the largest most strategic parcels. Unknowingly their locational decisions tend to set the pattern of land use for other economic and non-economic organizations" (p. 318). Blau and Scott (1962) also emphasize the importance of firm's decisions as they ". . . affect such diverse aspects as the location of the community, its size and growth pattern, the functions it performs for the larger society, its occupational composition, its total landuse pattern, its power and class structure, and its general character" (p. 199).

Although the influence of the business firm in the urban environment

is crucial, little research has been done to measure the exact dimensions of this influence.

Simon, realizing the inadequacies of most empirical studies on companies calls upon economists to adopt a more rigid behavioral approach in their research:

We are all concerned with human behavior in organizations; hence our work is, whether we call it so or not; behavioral science. We are particularly concerned with managerial behavior - hence with management functions. Since most of the behavior that occurs in organizations involves the choice of course of action, we all take the decision-making approach. Human behavior in organizations produces complex interactions and indirect consequences. (1964, b, pp. 77-78)

For the most part, this thesis adheres to the guidelines set forth in the above quotation. The thesis examines one aspect of decision-making in the firm (marketing strategy) and investigates that particular manifestation of managerial behavior in a manner acceptable to the behavioral science.

This approach taken here is in contrast to the more traditional micro-economic methods. Most recent literature on the theory of the firm makes it obvious that the traditional micro-economic approach is no longer considered adequate enough to portray a useful picture of the real world firm. The traditional theory 'postulates a relationship between 'input factors' -- labour and capital on the one hand, and physical output on the other, through the medium of a production function,' (Ansoff, 1969, p. 11). Inherent in the theory is the assumption of a boundlessly rational economic man who manipulates the factors involved and who makes all the correct decisions in order to maximize profits. The 'rationalistic

concepts' (Hill & Egan, 1966) of the firm can be distinguished by four major characteristics: 1) an emphasis on action by a collective rather than by actors in a collective; 2) the common assumption of predetermined behavior patterns which are ordinarily presumed to be rational; 3) a clear-cut goal (usually profit maximization); 4) an external environment which creates the need for action (p. 15).

A great deal of criticism has been leveled at the traditional theory. Ansoff (1969) says that the theory fails to explain behavior of real firms and is not useful to business firms in their decision making.

It has been argued that the concept of profit maximization is incorrect both descriptively and normatively. Descriptively, because empirical studies of firms show that while firms do indeed seek profit, they also appear to seek other objectives. Normatively, because of a growing climate of opinion that firms should accept other goals for its behavior in addition to profit. Due to the fact that it excludes behavioral and informational variables, micro-economic theory provides no differentiation among firms. According to the theory, given a set of initial economic conditions, all firms will behave identically. Whereas in actual fact one observes differences of behavior among firms in the same environment. (Ansoff, 1969, pp. 12-13)

In reply, Ansoff calls for a theory of the firm that includes "behavioral variables," which describe people and their relationships within the firm, as well as "informational variables" which measure and define states of knowledge about the firm available to various participants. He also takes pains to point out the great importance in any new theory of "structural variables" and "strategic variables" (1969, pp. 12-40). Ansoff (1965) uses Chandler's (1962) work on corporate structure to show that the form and dimensions of any corporate bureaucracy to a large extent

influence the behavior of the firm as a whole as well as individual behavior in the firm. But Chandler also says that "structure follows strategy" and to a large extent strategy is dependent upon individuals in the firm who pursue specific and often personal goals. Starbuck (1965) states that "It would be nice to say that some of these goals are characteristic of certain types (forms) of organizations and not others Certainly such relationships must exist. But the existing data is fragmentary." (p. 468). Also, the structure of the organization's environment determines the relative effectiveness of different behavior strategies (Dent, 1959). As it appears here, we have a triad of interdependent and interrelated variables -- character, structure, and strategy.

Ansoff's main concern, however, is for strategy. "In many ways strategic decisions are the basic determinants in the success of the firm for, unless the firm's products are addressed to market areas in which a demand exists and in which the competitive climate is favorable, even the best organizational form, or the most brilliant control of operations will fail to produce profit" (1969, p. 15).

Ansoff has not been the only social scientist to note the ills of micro-economic theory. In reaction to what Adli Stevenson called "smash and grab imperialism" some have even stated that the idea of profit maximization is both immoral and socially unacceptable (Anthony, 1968). Although few people agree with such an extreme view, most can readily see that micro-economics is basically a static theory concerned with successive equilibrium conditions and thus not capable of dealing with distinctions

between short- and long-range plans. Also, the theory does not recognize the tradeoff between investments for current profit and those for future profit (Cyert & March, 1963). Some economists have offered alternative corporate goals to replace profit maximization.¹ One of the more interesting replacement theories is that put forth by Baumol who claims that "a variety of goals are apt to influence the operation of any company in a manner which is not precisely specified nor clearly determined (1964, p. 323). He himself believes that company growth obtained through increased sales volume at the expense of profit is both the prime objective and modus operandi of many firms he has studied (1959). Baumol goes as far as stating that firms embark on an implicit policy of profit constraint in order to fulfill the aspirations of some managerial groups to expand the firm's share of the market. Market share, rising sales volume, and multiplicity of profits are not synonymous with profit. In a similar vein, it is interesting to note that Roberts (1956) found that the salary of the highest paid executive is independent of the firm's profit; and increased exponentially with the firm's sales volume (March, 1965, p. 455). Baumol's ideas are appealing and persuasive but as yet not enough empirical data has been gathered to conclusively support his statements.

Drucker (1958) also discounts profit maximization as the primary goal of business firms and suggests that survival is the central purpose. Starbuck (1965) supports this point and claims that survival is the only true

¹See Solomon (1963) for maximization of net worth and Beranek (1963) for maximization of market value.

measure of a firm's efficiency (p. 463). The problem with this idea as with many others is that the 'real world' firm does not appear to have one main goal or objective. Most firms seem to have a very complex system of goals. There are goals for the firm as a whole, goals for groups in the firm, and individual goals. All of these are intertwined, sometimes complimenting one another, sometimes in conflict. The heirarchy of goals may constantly shift depending upon the organizational structure, environment, and personality dominance of the actors in the firm.

Cyert and March (1963) investigate in depth the decision-making behavior of the firm. They, too realize that traditional economic theory "has not been adequate to cope with oligopolistic markets" (p. 115). Their alternative to this theory comes in the form of a description of how 'real world' firms function and make decisions. The image they produce is much different from the one projected in 'rational' economic theory. Their actor, the firm, is merely a manifestation of many individual actors. The firm's actions are not always economically rational, nor are the goals it strives for always those professed. The main point in their book, A Behavioral Theory of the Firm, is that the manifest behavior of any firm can only be rationalized when the behavior of the individuals in the firm is examined.

Following closely on this theme is the work of Simon (1957a and b, 1959, 1960, 1964a and b) who states that the central concern of administrative theory is with the boundary between rational and non-rational aspects of human social behavior. Administrative behavior is peculiarly of the

theory of intended and bounded rationality of the behavior of human beings who satisfice because they do not have the capacity to maximize (1964, b). The firm may be described as a pattern of relationships among individuals, none of whom act with perfect rationality, but all of whom attempt to be as rational as possible within the limits set for them by their personalities and by the environment. The firm becomes an imperfect decision-making machine, forced to choose between alternatives without knowing exactly what the results of each choice will be. Under such conditions it becomes evident that men in business cannot know the best alternative in all cases where choices must be made; they cannot therefore maximize anything. What businessmen must strive for is not maximum profits, but rather for behavior patterns that produce satisfactory conclusions. In a discussion of these ideas McGuire (1966) states that Simon's concept of the firm "rests more securely upon the base of reality than do, for example, the economic notions of the firm" (Hill & Egan, 1966, p. 22).

In summary, the firm can be regarded as having the following features: 1) it is the actors within the firm, rather than the firm itself, that acts; 2) that behavior is conditioned by personality as well as environment factors; 3) that as a minimum, the behavioral processes examined must take into account the cognition, perception, beliefs, and knowledge of the actors; 4) that rewards and goals are often complex (McGuire, 1961).

Behavioral Variables in Decision-Making

At least three basic variables can be identified in any discussion

of decision-making. These are, character, structure, and strategy.

Character. Character may be defined as "the attributes or features that make up and distinguish the individual" (Webster, 1967). Since it is virtually impossible to describe all the features or attributes of character a few basic ones are usually chosen. This procedure is followed in psychology, sociology, etc. as well as the physical sciences, for what is really being done is a process of categorization.

The difficulty in discussing the character of the decision-maker lies in the isolation and measurement of characteristic traits that will be sensitive enough to identify every individual, but allow enough flexibility that actors of like character can be easily grouped. Because character is usually closely associated with behavior, actors of similar character should also exhibit similar behavior.

In a discussion of locational decision-makers Pred suggests that the amount of information possessed by an actor and the ability to use that information is sufficient to categorize decision-makers according to the above guidelines.

. . . every locational decision is viewed as occurring under conditions of varying information ability, ranging, at least theoretically, from null to perfect knowledge of all alternatives, as being governed by all varying abilities (as well as objectives) of the decision-makers. In the behavioral matrix, the information variable is depicted on the vertical axis, and the ability to act variable, which theoretically varies from total ineptitude to an aptitude for optimal solution, is represented on the horizontal axis. The locational decision-making unit or actor, be it a single person or a firm, can be thought of jointly having a real spatial attribute (site and situation, land use, or pattern of movement) that is reproducible (conveyable) on a map, and

behavioral qualities that can be hypothetically located in the behavioral matrix. (Pred, 1967, p. 24)

Pred never suggests any measurement techniques for his two characteristics nor does he offer any empirical data to support his statements. However, Claus (1969) in a study of corporate decision-makers does present rigid instrumentation and concrete empirical data to back his hypothesis that actors (firms) can be distinguished by their information and ability to act and that these characteristics correlate very highly with the individual firm's locational behavior. Claus demonstrated that as the oligopolist's information and ability to act on that information increased, so did the quality of site that was chosen.

It is not claimed that information and ability to act are the only characteristics by which a decision-maker may be classified. Indeed, it is conceivable that certain circumstances and certain decision-makers will necessitate some other measurement of character. It has already been suggested that role analysis (Gross et al, 1964) and attitude or perception (Harvey, 1969) may be adequate to distinguish the character of the locational decision-maker.

The problem with these measures of character, as with information and ability to act, lies in the difficulty of valid research design. As Harvey (1969) states:

We know that decisions are affected by attitudes, dispositions, preferences, and the like. We know, too, that mental processes may mediate the flow of information from the environment in such a way that one individual perceives a situation differently from another even though the external stimuli are the same. (p. 36).

Harvey is really voicing a recognition that many factors internal to the actor himself may prevent accurate measurement on the individual's character. As it now stands, very little is actually known about how people perceive the environment and how they use their perceived information to achieve the goals they desire. It is obvious that more work must be done before the effects of the decision-maker's character on the landscape is truly understood.

Structure. To hold participants together in the completion of common programs of activity and in pursuit of goals, most business firms have developed relatively stable internal structures. Most research studies of such organizations stress a hierarchical ordering of authority and responsibility, careful specification of tasks to be performed and of positions to be filled, formal rules and regulations to govern many decisions and actions, and channels for the routing of information through the organization (Dill, 1965, p. 1096).

To cope with the diversity in the structure, type, and size of organizations a great many theories have been put forward.

Weber (1947), the most influential writer in the "structuralist" school, outlined his "typology of authority" which defined the "ideal-type" bureaucracy. Central to Weber's theory is the existence of rules which codify behavior in each office of the organization. He is primarily interested in the bureaucracy (firm) as a functional structure, which he considers to be bound together by rational laws into an organization. Weber suggested that to be effective and efficient as an organizational instrument, a modern

organizational structure requires bureaucratic authority. Charismatic relations lack any systematic division of labour, specialization, or stability (Etzioni, 1964, p. 52).

Weber is very normative in his approach and is opposed by those in the "classical" school and the "human relations" school. Classical organization theory, as first stated by Gulick and Urwick (1937), rests on the assumption that the more a particular job can be broken down into its simplest parts, the more specialized and consequently the more skilled a worker can become. Following on this line, the neo-classical approach, as represented by Simon, Smithburg and Thompson (1959), pays considerable attention to formal structure and to rational considerations; it differs from the structuralist approach in studying the actual ways values (or goals and subgoals) of an organization can be and are implemented. The "human relation" approach as exemplified by Lewin (1952) can be summarized as follows: 1) the amount of work carried out by a worker is not determined by his physical capacity but his social "capacity;" 2) noneconomic rewards play a central role in determining the motivation and happiness of the worker; 3) the highest specialization is by no means the most efficient form of the division of labour; and 4) workers do not react to management and its norms and rewards as individuals but as members of a group.

Empirical studies on organizational structure have tended to rely on Weber's basic formulation of bureaucratic hierarchy.² Like corporate

²Hall (1962, p. 396) lists Merton, Udy, Heady, Parsons, Bergen, and Litwak as prominent authorities in this field who have used Weber's approach to bureaucracy.

character, corporate structure is troubled by a lack of methods and techniques to scale structure³ in a fashion that is acceptable to sound behavioral research. The literature contains several examples of techniques for measuring structure (Hall, 1962; Blau & Scott, 1962; March, 1965 -- especially chapters on research methodology), but each empirical research design has been modeled to test a specific hypothesis.

It would appear that the behavior of a firm may be examined in the context of its bureaucracy. "Different types of behavior and interpersonal relationships are expected at different hierarchical levels and these differences would appear to influence the structure" (Hall, 1962, p. 397). The converse has also been observed where structure has a definite influence on the behavior of individuals within the organization (Form, 1954; Chandler, 1962).

In general it can be said that varying degrees of bureaucratization "certainly have concomitant effects on other organization phenomena such as participant's behavior, effectiveness of goal-attaining endeavors, and relations with the external environment both in terms of individuals and other organizations" (Hall, 1962, p. 402).

Strategy. A strategy is a means of securing a goal. Or as Kelley puts it, "Strategy . . . consists of long term plans of action designed to secure long term ends" (1968, p. 9). In the business world the term

³Because there is no standard measurement scale for bureaucratic structure the first task of the researcher is to establish some viable unit of measurement (dimension) for scaling the phenomena.

strategy can have two meanings. A pure strategy is a move or a specific series of moves by a firm such as a product development program in which successive products and markets are delineated, and a grand or mixed strategy is a statistical decision rule for deciding which particular pure strategy the firm should select (Ansoff, 1965).

The term strategy should not be confused with tactics. Tactics involve short-run decisions that are not crucial to the survival of the firm. "They are quickly made adjustments to a rapidly changing market environment occasioned by the action of a competitor, government body, change in the consumer's status attitudes, and the like" (Kelley, 1968, p. 10). On the other hand, strategic decisions commit major resources of the firm for a relatively long time and reflect the basic goals of the business.

A term often used interchangeably with strategy is policy. In its precise form, policy has come to mean a specific response to specific repetitive situations. A policy is usually an explicit written statement of procedure to be implemented when a particular situation arises. "Policy is a contingent decision" (Ansoff, 1965, p. 119). Strategy, however, is usually implicit and takes the form of a course of action. Policy statements are the means by which a strategy is instituted and manoeuvred.

Since strategies are a means to achieving goals and since goals can be personal as well as collusive, it follows that strategies are extremely complex in nature and are in constant interaction with one another. Actors with similar goals may employ different strategies to

achieve their ends; on the other hand, actors with entirely unrelated goals may employ identical strategies. Firms and individuals attempting to secure their own goals come into direct conflict with opposing strategies. This is patently obvious in the business world where the goal may be to capture part of a competitor's market. In fact, free enterprise is built on the premise that marketing strategies do exist and will come into conflict.

It is interesting to observe how corporate management uses strategy to change the environment and how environmental change causes a shift in strategy. The modern firm may be viewed as a "purposive, goal-seeking organization" (Ansoff, 1969, p. 14) which is designed and guided by a management. The management process itself consists of three levels of decision-making: operations, administration, and strategy.

Operating or logistics decisions are concerned with the physical functioning of the firm. Such things as accounting, ordering, billing, processing, etc. are handled by operational decisions. Most of these situations are governed by explicit routine procedure and the decisions are merely a job of discriminating key criteria.

Administrative decisions are concerned with the structural pattern of job responsibility and duty. Tasks are designated and operations are seen to be co-ordinated and efficient. Persons occupied with this level of management process are responsible for executing strategic decisions using policy statements as guidelines.

"The strategic decision area is concerned with establishing the

relationship between the firm and its environment" (Ansoff, 1969, p. 14). These decisions establish the fundamental links between a corporation and the outside world. Questions like what product? what market? what resource allocations? are dealt with in strategic decisions. Strategy is the basic determinant in the success or failure of the firm.

Because of their importance, it would seem that strategic decisions should receive top management's highest priority. Historical analysis, however, shows us that this is not the case. Management manifests an interest in strategy only periodically (Chandler, 1962).⁴ Many firms also exhibit a 'lag response' to environmental change. Such firms fail to anticipate or react to an environmental change which necessitates a modification in strategy. Only when current strategies are seen to be responsible for failure does the company shift its modus operandi. Typically the firm seeks its cure by a change in operations, then in organizational reshuffle, and finally through strategic overhaul.

Power of all three levels of decision resides in one cadre of the organization -- top management. Management invariably tends to give

⁴In Strategy and Structure, Chandler presents an historical analysis of the growth and development of a number of firms, but concentrates on General Motors, DuPont, Sears-Roebuck, and Standard Oil of New Jersey. The main point of the book is that corporate structure should provide an administrative environment in which a proper balance of management attention can be maintained.

operating decisions top priority.⁵ It is for this reason that environment changes are perceived indirectly through the impact that they have on the logistic process. Decision needs signalled by the logistic processes are analyzed serially, initially as operating deficiencies, secondly as administrative, and thirdly as strategic (Ansoff, 1969, p. 17).

Although serial decision-making is characteristic of most business firms, there are other methods of perceiving environmental change. To reduce 'lag response' firms may practice anticipatory response in which the firm seeks through forward planning to foresee significant changes in the environment. Here the firm's contact with the outside world is direct and response to strategic challenge is quicker. Even more advanced is self-triggered response where the firm is continually searching for growth and expansion opportunities.

The complexity of this topic is increased when one realizes that the literature offers no typology of strategy; in fact, most firms are unaware of the fact that they follow a particular corporate strategy. Tilles (1969) makes a plea for explicit corporate strategy:

The need for an explicit strategy stems from two key attributes of the business organization: first, that success depends on people working together so that their efforts are mutually reinforcing; and second, that this be accomplished in the context of rapidly changing conditions. In the absence of an explicit statement of strategy, obsolete patterns of corporate behavior are extraordinarily difficult to modify.

⁵Ansoff (1969) gives four reasons why operating decisions receive priority: 1) they are routine and repetitive, 2) they are automatically brought to top managers attention by lower managers, 3) they are frequent and in large number, 4) top managers find them familiar by virtue of training at lower levels in the firm (pp. 15-16).

Where there is no clear concept of what current strategy is, the determination of what might be changed, and why, must rest on either subjective or intuitive assessment.
(p. 181)

Although Tilles requests that strategy should be a formal, explicit statement, he never presents a typology of the different kinds of strategies that a firm may adopt. The literature discusses a whole host of strategic decision processes, ranging from the important product-market mix (Sloan, 1964; Borden, 1964) to intelligence and anti-espionage strategies (Kelley, 1968). Marketing strategy is only one of the many types of strategies in which a corporation may engage itself. The field of marketing strategy is of special concern to companies who are engaged directly in the retailing of goods and services.

Marketing Strategy

A firm engaged in marketing is acutely aware of the environment. As stated earlier, the more unstable the market becomes the more a firm has to adjust its strategy. This is especially true in the present retailing market where customers are better informed, have more money, and demand wider ranges and varieties of products. In order to compete successfully the management must keep its eye on the market in anticipation of adverse competitive tactics and strategies. Today, marketing strategy can make or break a firm. For example, the success of the Wilkinson razor blade and Playboy illustrates the dramatic impact that a new product concept may have on the fortunes of a company (Tilles, 1969). Mere

tenacity can occasionally be the correct formula.⁶

Whatever the winning combination may be, the marketing sector of a corporation is usually first to notice a change in environmental conditions. It is quite probable that marketing strategies, in turn, have the most immediate effect on the environment.

In an article entitled, "marketing Myopia," Levitt (1960) says that even when enterprises become successful they are apt to slump because of their indulgence in outmoded marketing strategies. Levitt notes four conditions that tend to foster decay in the midst of plenty: 1) reliance on population growth, 2) confidence in the infallibility of one's current product, 3) reliance of cost efficiencies of mass production, 4) pre-occupation with products that lend themselves to carefully controlled scientific experimentation, improvement, and manufacturing cost reduction.

Of the large body of literature⁷ that exists on marketing strategy few authors use the same generic heading to classify the types of strategic

⁶An excellent example is provided by the case of the Sylvania Corporation in its success in fluorescent light starters. At the time a self-starting unit was introduced, light starters were a highly competitive item of low profitability. In the face of the apparent prospect of declining demand, several of the major suppliers decided to get out of the light starter business. Sylvania, on the other hand, saw in these actions a prospect of declining capacity which more than offset the decline in demand. It judged the demand to capacity ratio to be favorable, stayed in the business, and turned it into a profitable item. (Ansoff, 1965, p. 189).

⁷See Alder (1967), Bell (1966), Cox et al (1964), Bursk and Chapman (1964) to mention but a few.

moves a firm may make. Included below are five of the most common divisions of marketing strategy. Because it is impossible to include all the tactics a firm may employ under each strategy only a few important ones will be examined.

Strategy of innovation. Develop new products; devise new services; find new ways of distributing products; discover new and creative methods of promoting them. Innovation of a new product is frequently the most successful competitive tactic because it offers the potential of radically changing competitive relationships. It can do this either by creating new product concepts which set the company apart, or by creating a new market or marketing concept which has the same effect. The opportunities or innovation with respect to market are no less than with respect to products. This can be seen in the automotive industry where car dealers created the instrument of time payment to allow consumers the money to buy expensive cars. This marketing tactic is now universally applied to almost every consumer good. In fact, carrying charges are now an important source of income to many retailers.

The injection of newly discovered elements into an existing situation transforms the situation, and a new pattern results. "Thus, the function of self-service in a store, in combination with an adjacent parking lot, results in a new institutional form which we know as the supermarket . . ." (Barnet, 1964, p. 57). The new form generates opposition, forces emulation, and fosters further innovating. Department stores open suburban branches in conjunction with supermarkets thus creating shopping

centers to take advantage of high populations of shoppers in the super-markets. Even the smaller competing grocery stores must enter this type of competition and in response offer trading stamps to compensate for loss of business to the shopping centers.

In short, innovistic competition not only brings about the reallocation of known resources, but also encourages and even compels continuous research for new products, new applications, and new methods. It is a force which threatens the status quo, and as such causes a change in the environment.

Strategy of efficiency. Provide convenience and speed with which goods may be made available. This strategy can cover a very wide range of tactics from how to arrange cans on store shelves to placing a local dealership in a city. In fact, one of the earliest and most successful strategies of this kind was that of Sears-Roebuck who initiated national catalogue purchasing.

Before discussing this strategy more fully it must be realized that in today's world, time is often equated with money. By minimizing the consumer's purchasing time, the entrepreneur is, in effect, cutting the price of the product. Because the price cut is accomplished by indirect means, i.e. more convenient service or less search time, this form of marketing strategy will be discussed separately from the more direct method of lowering the listed purchase price of the product. In the last analysis, the strategy of efficiency is really one of minimization of total costs on behalf of the consumer.

Kelley (1958) states that consumers must achieve an acceptable balance between "commodity cost" and "convenience cost." Commodity costs are the sums of money paid to the retailer in exchange for the good. Convenience costs are the sums of money paid out for expenses that are incident to the purchase (e.g. gasoline, parking, postage, delivery charge, financing charge, bus fare, etc.), plus the expenditure of time and physical and nervous energy that must be made to purchase the good.⁸

To maximize efficiency, buyers must organize their purchases into clusters through the device of multi-purpose shopping trips that reduce the time and effort required for individual transactions. They concentrate their purchasing geographically by going to stores and shopping centers where they can find a wide variety of goods and services within a small area. "Convenience is one of the services some types of retail stores provide for their customers" (Cox, 1959, p. 360).

Cox is saying that consumers may, in fact, be willing to pay money in exchange for "convenience." This is witnessed every day when we see people purchase cigarettes from a dispensing machine when they could easily buy them for 4 cents less in a retail store. People put a real price on the service and convenience that they receive.

The impact of this to marketing strategy occurs when a firm decides that it will offer added convenience or service, and yet sell the product for the same price as a competitor. The consumer realizes a

⁸Also see Kelley (1955) on "Retail Structure of Urban Economy."

real saving. Firms also compete by offering different types and different degrees of service. This is then a case of product differentiation, and the effect of service and convenience on the price cannot be measured.

Connected to this concept of marketing efficiency (i.e. minimization of consumers real and personal costs) is the practice of providing internal linkages and complementarity for the shopper. The best example of internal linkage is, of course, the department store where a woman who wishes to buy a clothing outfit can find, besides her basic attire, a large sample of purses, shoes, hats, gloves, etc. which she deems as necessary additions to the original purchase. All these connected goods are found within easy access under one roof or perhaps on one floor, so as to minimize her search time. Complementarity is best demonstrated by the planned shopping center which contains a large number of small shops each carrying only a few products but which are highly accessible to one another. In this case a woman shopper may have to go to two or three shops to fill her wardrobe requirements.

Although Cox may be correct about "convenience" to a certain degree, he is mistaken when he says that the consumer "endeavors to maximize the return he receives in all forms" (1959, p. 361). Martineau (1958a) points out that there is "Clearly . . . a force operative in the determination of the store's customer body besides the obvious functional factors of location, price ranges, and merchandise offerings" (p. 47). He calls this other force "store personality" but what he is really talking about is market segmentation. This topic is discussed in a following section and

is only brought up here to caution the reader that the strategy of convenience is more complex than might be imagined. Although its location, quality of goods, and price of goods are comparable favorably, people with a \$100,000 home don't usually buy household goods from the Salvation Army Thrift Store.

It is interesting to note that business firms do not always choose a location for a store that will maximize that store's customer potential. Alderson and Shapiro (1964) cite the case where a firm must choose between "optimal site location and optimal network expansion" (p. 196). Optimal expansion of a network favors the most efficient use of other marketing tactics such as advertising and credit cards but business potential at an individual site may have to be sacrificed in order to achieve proper market representation. Most large corporations are faced by the problem in their evaluation of strategy. Opting for the best site will provide immediate short-run convenience to a local customer, while the network strategy is a long-run move aimed at a much broader market. For large national and international firms, like Shell, the network option has worked well.

Another efficiency strategy is the location of one-stop shopping outlets in positions that minimize the consumer's 'costs.' In low order automobile shopping it has been observed that the most successful retail sites are those that minimize the motorist's time and maximize his convenience (Claus & Rothwell, 1970). Most often these outlets carry products that have a low cross elasticity of demand. Although individual products may be higher priced than in shopping centers the added convenience of location more than makes up for this price differential.

These automobile-oriented stores are normally located on major traffic arteries and are identified in the literature as "ribbon developments" (Berry, 1959).

Before leaving this section on strategy a brief word must be said about credit cards. The influence of this innovation is only being recognized today and its full significance is far from realized. The appeal of the credit card must come under the strategy of convenience. Although the credit card may eventually cost its holder more (interest on back payments, etc.) than paying in straight cash, its benefit is derived from its ease of use and the convenience it affords the user in not having to carry money or balancing in-the-pocket funds.

Strategy of price. Provide comparable or substitute goods at a lower price than competition. Price strategy being the most common and usually the most effective method of competition is well developed in the literature (see Bursk & Chapman, 1964; Enis & Cox, 1969; Cox et al, 1964). Almost every issue of marketing journals contains at least one article on how to arrive at a pricing strategy. The firm with the lowest production costs, more efficient management, and best channelling system, can provide goods at a lower price than the competitors, and should therefore have the largest share of the market.

In actual fact, however, the usual market situation is one of price leadership, where the large majority of producers or sellers market the same good at identical prices. Cassady (1954) distinguishes three types of price leadership:

1. Barometric-firm price leadership, where adherence by nonleaders rests on skilled and timely adjustments of prices to market conditions by some one competitor.
2. Dominant-firm leadership, where small competitors exist on sufferance and fully realize their vulnerability to dominant-firm action, hence adhere.
3. Price leadership implemented by group action, where vendors, dissatisfied with the results of a competitive leadership scheme, employ some type of collusive arrangement to insure effectiveness. (pp. 95-99)

Cassady uses the petroleum industry as an example of the barometric type of price leadership.

In some instances the price of the product, although important to the producer, is not of major significance to the consumer or individual seller. The cross elasticity of demand for some goods is so low that an individual dealer may not even check his competitor's price. This is especially true for such items as food, beverages, tobacco, gasoline, etc. where a small drop in price by one retail outlet will not appreciably affect the market as a whole. With such items as furniture, houses, automobiles, and even clothing customers are more aware of price differentials and seek to find their best buy.

In many instances price competition is prohibited by law, for example, public utilities, trucking, airlines, etc. One unusual case of prohibition of price competition is recorded in Massachusetts in 1956 where General Electric sought a court injunction against individual dealers for selling G.E. products at a lower price than similar products of other brands were being sold (Barnet, 1964, p. 50).

Boston. March 8. The full bench of the Massachusetts Supreme Judicial Court ruled that the State fair trade law is valid The court . . . states General Electric is entitled to an injunction restraining the defendant from selling the plaintiff's small appliances at lower prices than those now, or hereafter, permitted in its fair trade agreement with other retailers. (Retailing Daily, March 9, 1956)

Price competition though effective is used only in specific circumstances.

Strategy of competitive difference. Provide unusual or distinctive goods, or goods that appear distinctive to the customer.

From a strategy viewpoint, product differentiation is securing a measure of control over the demand for a product by advertising or promoting differences between a product and the products of competing sellers. It is basically the result of sellers' desires to establish firm market positions and/or to insulate their business against price competition. Differentiation tends to be characterized by heavy use of advertising and promotion and to result in prices that are somewhat above equilibrium levels associated with perfectly competitive conditions. It may be classified as promotional strategy. (Smith, 1956, p. 6)

This is really the world of the Madison Avenue advertising firms who mastermind the multimillion advertising campaigns for soap, cigarettes, beer, etc.

A company that can establish a real competitive difference may often corner a segment of the market. For example, American Motors was able to survive and prosper by differentiating its product from that of General Motors and Ford, and cultivating a consumer subgroup, whereas Studebaker-Packard persisted in trying to compete directly with the large firms and failed.

In today's consumer market, competitive difference occurs in almost every retail product. It has been the oligopolist's alternative to price competition.

Strategy of market segmentation. Directing a product at a particular socio-economic group.

Market segmentation . . . consists of viewing a heterogeneous market as a number of smaller homogeneous markets in response to differing product preferences among important market segments. It is attributable to the desires of consumers or users for more precise satisfaction of their varying wants. Like differentiation, segmentation often involves substantial use of advertising and promotion. This is to inform market segments of the availability of goods or services produced for or presented as meeting their needs with precision. Under these circumstances, prices tend to be somewhat closer to perfectly competitive equilibrium. Market segmentation is essentially a merchandising strategy. (Smith, 1956, p. 6)

This facet of marketing strategy is responsible for the success of many modern firms. Myers and Nicosia (1968) note that, "Marketing management policies, strategies and tactics depend progressively on identification of useful market segments, particularly in a society becoming more affluent" (p. 182). In recent years the concept of market segmentation has resulted in a proliferation of similar products. In the cosmetics field, for instance, consider what manufacturers of make-up and skin-care preparations have achieved. Once upon a time there was a product called cold cream. Now cold cream, although it still exists, has been "spun off" into foundation, cleansing, vanishing, nourishing, conditioning, hormone, astringent, lanolin, marrow, and wrinkle cream. Similar situations have occurred with a multitude of other products and services.

An interesting example of market segmentation is the case of Control Data. IBM, the most dominant company in the field, had a large and skilful sales force and a broad range of customer services. The cost of supporting these, however, was built into the computer's price. Control Data recognized that users of large computers are capable of developing their own software and providing their own services. A good machine at a competitive price was therefore possible as a commercial success for a small company. Once Control Data launched its attack on the market segment, IBM could not counter its price requirements because of its own requirements for consistency across a broad product range. Control Data was therefore able to grow rapidly, so rapidly, in fact, that it has now expanded beyond its original market segment and must revise its strategy (Tilles, 1969, p. 188).

Market segmentation also occurs in the urban retail structure. Martineau (1958a) points out that "regardless of the ability to pay, all shoppers seek stores whose total image is acceptable and appealing to them individually" (p. 49). He goes on to point out that the shopping situation includes many things not directly associated with specific items but closely connected to various patterns of consumer behavior. "As the shopper fits the stores into her planning, she manipulates store images in her mind. In a large part, where she goes and what she buys depends on the subjective attributes that are a part of the store's image:- atmosphere, status, personnel, other customers" (p. 55). In another article on "Social Classes and Spending Behavior" Martineau (1958b) claims that entrepreneurs must design their retail sites to fit the demands of a selected market segment.

As yet, little work has been done toward retail site selection and design on the basis of market segmentation although it is obvious that firms intuitively practice this strategy.

Firms also use linkage and complementarity in conjunction with market segmentation to promote sales. A large expensive downtown hotel, for example, will have high priced jewelry, fur, and clothing shops within or in close proximity to the establishment, while less expensive hotels are not likely to take advantage of this situation. Where there is an attraction of a certain social segment to one place or one area, firms catering to the demands of that class will likely establish complementary businesses nearby. There is also what might be called "cross town linkage," where people, no matter where they may be in the city, will seek to find the type of establishment that agrees with their social image. In a strange environment, the reputation of the store's name or the brand of the goods it sells are often used as criteria for choosing the outlet. A firm that can create a favorable image with a chain of stores may be able to obtain a certain amount of customer loyalty within a segment of the population. In gasoline service stations, for instance, Dupont (1954) has estimated that 20 per cent of all customers are loyal to one brand of gasoline.

Summary. The above discussion on marketing strategies is not intended to cover the field; but simply to demonstrate the subtleties of a highly complex topic. It must be realized that a firm may employ any number of these strategies in varying degrees to a multitude of products. To predict the success of any combination of tactics has largely been a

matter of business experience and luck. The adoption of a specific marketing strategy is to a large degree a reflection of how the firm perceives its environment. Likewise, the actions of the firm are mirrored in the environment, both physically and culturally.

Nature of Marketing Strategy for Oil Companies

Marketing strategy in the gasoline retail industry generally takes two forms -- price competition and non-price competition.⁹ In fact, this split in marketing strategy is so basic that most experts do not regard these two strategies as mutually competitive¹⁰ (except in instances of unilateral price wars). Price competitive service stations compete directly with other price competitors while non-price stations are concerned only with stations which use non-price tactics to secure a portion of the market. Although these two groups do have an influence on one another, they are primarily preoccupied with their own segment of the market and engage in direct competition only rarely.¹¹ Under normal conditions firms in both groups use a number of sub-strategies and tactics (product differentiation being the most common) to compete against their peers.

⁹(Bain, 1944; Buck, 1960; Cassady & Jones, 1951; Cassady, 1964; Claus, 1969; Claus & Rothwell, 1970; Fleming, 1954, 1966; Morrow, 1967; Stanford Research Institute, 1964; Warren & Wong, 1961).

¹⁰See especially Cassady & Jones, 1951; Cassady, 1964; Morrow, 1967.

¹¹Such rare occasions are called price wars. In this case, all firms use the same strategy -- price competition.

To understand the nature of competition one must have some understanding of the market demand for gasoline:

1. Gasoline has only one main use, therefore consumers cannot put the product to other uses when its price is low, and thereby expand consumption.
2. There are no practical substitutes for gasoline as a motor fuel, thus consumers cannot shift to other products when the price increases.
3. Gasoline is a product whose demand is derived,¹² thus customers are not likely to use more merely because the price is low.
4. Gasoline is jointly demanded with other products, so that its purchase accounts for only part of the transportation expenses; thus a lower price is not likely to induce greater consumption (Cassady & Jones, 1951, pp. 20-21).

These characteristics are consistent with the findings that the demand for gasoline is very inelastic; "a 10 per cent change in the average retail price would result in something like a 1.3 per cent change in the quantity taken by consumers" (Cassady & Jones, 1951, p. 21). Cross elasticity of demand however is a different story. Up to a certain point, a differential price in gasoline exhibits a low cross elasticity of demand. Normally, only a small percentage of consumers look for bargain prices in gasoline¹³ and a price differential of 2¢ will go

¹²Derived demand: the demand for one product is created by the demand for another related product. For example, the demand for typewriter ribbon is created by people who use typewriters.

¹³It has been estimated that only 2 per cent of motorists are bargain hunters (Business Week, March 21, 1953), but this will vary from market to market and may be as high as 10 - 12 per cent.

unnoticed by the general public. In the event of a greater differential, the demand curve becomes "kinked" and the cross elasticity of demand rises sharply. In such cases brand loyalty is abandoned and motorists seek stations offering lower prices (Warren & Wong, 1961, p. 9).

In economic terms (meaning price competitive) the gasoline market is regarded as a form of 'imperfect competition.' This is because there are relatively few sellers and a large number of buyers. The oligopolists in the market are called "majors"¹⁴ and each one has a considerable influence on the market as a whole. The majors are usually well informed about market conditions while the consumers are at a disadvantage because of their general lack of knowledge. Gasoline is basically a homogeneous product offering no appreciable difference in quality (although the majors promote the idea of product differentiation). Because of the nature of the industry, considerable capital is needed to establish an integrated firm in the market. This tends to limit the number of new entries as well as restricting the operating firms from shifting investments to take advantage of changing market conditions.

In response to the above situation a practice of price leadership has evolved. "The large oil companies, such as Esso, Standard, and Standard Oil Company of Indiana, attempt to set price to obtain a target return on investment" (McCarthy, 1960, p. 633). Whether the 'target return on investment' method is used or not, governments have investigated

¹⁴A major company has a completely integrated industrial structure and sells at least 2 per cent of the total North American market.

the oil companies many times and are well aware of the practice of price leadership, but have done little to discourage it (Morrow, 1967).

In summary, therefore, the so-called price leadership in the petroleum industry boils down to the fact that some company in each territory most of the time bears the onus of formally recognizing current conditions In short, unless the so-called price leader accurately interprets basic conditions and local conditions, it soon will not be the leading marketer. Price leadership does not mean that the price leader can set prices to get the maximum profit and force other marketers to conform. (Dean, 1951, p. 432)

The petroleum industry in North America is a very complex phenomena which runs the full gamut of retail-industrial functions. Some actors single handedly control extraction, manufacturing, distribution, and retailing of petroleum products, while other actors may act as independent businessmen performing any one of a number of steps in bringing oil products to the public. The retail aspect of the industry itself is also complex and involves many diverse methods of marketing and marketing strategies.

Besides the 25 major companies in North America there are also several subsidiary companies as well as a number of independents. Major companies often use subsidiaries as a front for price cutting. Because the names of stations and products are different, the company can cut prices without damaging the parent company's image. Subsidiary firms do not require major capital outlays nor do they tax the management of the parent enterprise. Independent stations sell relatively unknown brands (except locally), sometimes no brand is given, or it may be the service station's private brand. They utilize the high cross elasticity of demand for gasoline

by cutting prices.

Directness of competition in retailing is influenced by two independent variables: spatial proximity and similarity or dissimilarity of product. "Because of differing service requirements, the importance of the spatial element, and product preferences, consumers consider only a few stations as completely satisfactory substitutes for one another" (Cassady & Jones, 1951, p. 90).¹⁵ This means that only a very small number of stations are in direct competition. The competition of stations which are dissimilar in the quality of product, the type of service offered, or the spatial separation are in semidirect or indirect competition -- selling a little known brand of gasoline, providing a lower quality of service, being situated in a more inaccessible place.

Price-cutter stations offering a different type of "product-service" but located in close proximity to those with whom they indirectly compete, tend increasing toward gaining patronage at the expense of such indirect rivals as price differentials widen. However the effect of indirect rivalry takes place over a long time and is not as great as in the case of direct rivalry (Cassady & Jones, 1951). Direct rivals, including price-cutters as well as non-price competitors, may attempt to attract customers by differentiating their products in the mind of the buyer (advertising and promotion), by providing superior product-service (convenience, personal

¹⁵One cannot do a complete study of gasoline retailing without frequent reference to Cassady and Jones.

service, credit cards), by making concessions from the market price (coupons, bonuses, give-aways, prizes), or by any combination of these.

Non-price strategy. In this form of intra-group rivalry, the matter of brand becomes critical. Most majors establish an image on a national or regional basis by extensive advertising and promotion. The concept is the same as in the cigarette industry where an attempt is made to build product differentiation in the mind of the consumer. A strong brand may have a large number of brand loyal patrons. Insofar as the price differential between brands is very nominal or nonexistent, intra-group rivalry is based on the strength of the brands as supported by dealer services. Thus all dealers affiliated with the producer attempt to support and enhance a single brand image in order to take advantage of a brand-conscious market. It is also to the advantage of individual dealers to foster station loyalty as well as brand loyalty by offering better quality services and facilities. It has been found that the reverse effect is also true; brand loyalty is established by a motorist because of the affinity he may have for a particular station (Dupont, 1954).

Because their position in the market forces them to emphasize other than price competitive tactics, major company stations have stressed the quality of the product-service as well as semi-price and non-price competitive methods. The most widely used and most successful tactic employed by oil companies is the establishment of high quality service stations in highly accessible locations. This is usually accompanied by a full range of facilities and adequate services (Claus & Rothwell, 1970).

The performance of any single major station to a large extent depends on a number of crucial internal site variables as well as external site variables (see quality rating guides -- Kelley, 1955; Canoyer, 1946; Brick, 1968; Claus, 1969; Claus & Rothwell, 1970). Because these firms do not compete through price they must rely on development of convenience and accessibility.

Besides the basic sub-strategies of product differentiation and efficiency most major firms employ a number of other moves to attract patronage. Special feature prices on tires, batteries, and accessories (TBA) is a competitive weapon. Also, the use of give-aways, coupons, bonuses, prizes, contests, etc. is standard promotional practice. The use of gimmicks of this type usually takes one of three forms: 1) there is the game which appeals to the gambling instinct of the customer. Contests are set up in which the customer must return to the same station or same company in order to increase his chances of winning a prize. The consumer is motivated by the hope of something for nothing. 2) Give-aways, bonuses, and coupons are an indirect method of cutting price. For the regular price of gasoline, the customer receives a rebate in the form of merchandise or refund certificates. Care must be taken with this type of tactic that it does not antagonize consumers. Atlantic Richfield set up a promotion where they gave away good quality crystal for coupons received on a ten gallon purchase of gasoline. In their attempt to have customers buy at one station at regular intervals, they imposed a limit on the redemption time as well as restricting the coupons' return to the district in which it was issued. The company, however, miscalculated the normal length of time between

purchases and the range of consumer buying. Customer's exceeding the time limit or trying to redeem certificates outside their buying district were refused the promised merchandise. Customer refusal and hence loss of brand loyalty was a costly mistake for Atlantic Richfield. 3) Some outlets also give discount prices on non-related products like gardening, recreational, and sporting equipment. Customers are attracted to the station because of the low prices on other goods. This has become a favorite tactic with stations that already offer gasoline at lower prices.

A special note must again be made about credit cards. This innovation is used extensively by the major firms and represents a turning point in gasoline marketing strategy. Although the credit card affords the motorist an added convenience, it in turn demands a different type of site selection. The oil companies must not only continue to build high quality stations but also must locate on the customer's main pattern of automobile movement. A specific brand loyalty or brand preference can develop because a network of sites will fit into a customer's travel pattern even though the customer may own several credit cards of different brands.

With increased importance being placed on the ability of the customer to always be within easy reach of his credit card station, the whole concept of marketing strategy changes. Growing acceptance and use of credit cards is forcing gasoline companies to establish larger groups of brand loyal consumers and to keep their loyalty through proper networks of convenient and accessible stations. When a customer finds that he cannot always use his credit card when he wants to, or if he is displeased

with the service he receives at a brand station, then he may cease using his card altogether. A customer lost to another credit card brand is very difficult to win back. The following example will illustrate the strength of credit cards in a market situation. "One major-company executive" . . . claimed . . . "that credit card customers (as much as 80% of the patronage of many stations) are much less responsive to price cuts than cash customers. The reason for this . . . is that credit card customers have made a major decision regarding gasoline station patronage and will not as a result be usually alert to price reductions, especially when no money changes hands" (Cassady, 1964, p. 373).

While the credit card has dampened the influence of the price-cutter, it has only increased the competition between the majors. The emphasis on site competition still remains, but now the importance of proper selection becomes even more critical.

This is a perfect example of how an innovation may cause a change in the environment and in turn create a need for a shift in strategy. The new strategic decision is then reflected in the environment. In this particular case the strategic decision to adopt a network is reflected directly onto the landscape.

Price strategy. This form of marketing strategy is practiced by a small minority of the firms in the market. The firms are exclusively subsidiaries or independents and account for no more than 15 per cent of the total outlets in any given area.

The price-cutter realizes that a substantial segment of the market is price conscious and therefore is willing to take advantage of low-priced offerings. The price competitor is also aware that "the degree of cross-elasticity of demand for the product of any one seller will be sufficiently low so that price reductions may be made without inevitable retaliation. A seller may then feel that he can use a price cut to expand his trade because he believes that the effect on his competitors will not be so severe as to cause them to resort to countercutting" (Cassady, 1964, p. 359).

The use of this strategy is limited by two factors -- the size of the price differential and the number of price-cutters. Major companies will usually tolerate a 2¢ differential (Cassady, 1964; Warren & Wong, 1961; Morrow, 1967) but, if the gap widens a price war may ensue. Also if the percentage of the gasoline market captured by price-cutters reaches a certain level, say 20 per cent, then the majors will again take action. It is a known fact that the independent price-cutter usually suffers the most in an all out price war (Cassady & Jones, 1951; Cassady, 1964, p. 363), therefore, completely independent dealers are rarely the first to initiate or retaliate in such a campaign. In fact, many of them just close shop during a battle and let the majors fight it out.

Since price-cutters rely on the segment of the populace that looks for bargains they do not need highly accessible locations or outstanding facilities. Such frills only increase overhead and do not add substantially to the station's performance. Independents are not large enough to support or benefit from national advertising so product differentiation is not

stressed. Even if such firms could financially support a credit card system, their patrons are not the type of consumer that would use them. Price-cutter stations frequently lack such free facilities as washing windshields, checking oil, etc. A motorist is fortunate to find a washroom.

Because of their small number, competition among price-cutters is not fierce. Many of the stations rely on the patronage of repeat customers to maintain a good threshold. As much as 75-80 per cent of the business for price-cutters may come from repeat customers.¹⁶ Like the majors, the independent stations usually maintain a standard price, all of them being below the regular market by the same amount.

In order to attract the price-conscious consumer to their station, the independents also engage in promotional gimmicks like give-aways, coupons, bonuses. Local advertising using feature sales of TBA is used, but its overall effect is unknown. Cassady (1964) considers large "screaming" signs to be of major importance to price competitive dealers.

Although price-cutter stations are generally less accessible than major company stations, some price competitive firms (department stores) make use of high accessibility as well as price to attract customers. The usual method is to place a station (again one lacking many facilities) in close proximity to a large parking lot. The parking lot is inevitably owned and operated by the department store.

¹⁶Interview with Mr. Hayward of Hayward Petroleum.

In the last analysis price competitors can really be said to employ the strategy of market segmentation. They are not really competing through price in the classic sense. Their appeal is to a market that has particular buying habits. Real price competition would necessitate that they cut each others prices or that they cut prices below the limit generally tolerated by the majors. It is generally felt that consumers who patronize price-cutting service stations can also be placed into a specific socio-economic class. Further work should be done to explore this facet of the industry.

Summary. Non-price strategies are employed by majors who use mainly product differentiation and site quality to attract customers. Price strategy is used by independent dealers to capture a specific segment of the market.

Conclusion

It was noted early in this chapter that the nature of the modern firm is very complex and that any general statement about the character, structure, or strategy of a firm requires rigid empirical evidence. An interesting aspect of the firm's interaction with the environment is the mix of marketing strategies that it may employ. Looking specifically at the North American gasoline retail market it was seen that the actors concerned employ two basic strategies: price competition and non-price competition. This dichotomy was seen to be true even at the level of the Vancouver gasoline market.

CHAPTER 4

METHOD OF ANALYSIS AND RESULTS

The Vancouver gasoline service station industry has been chosen as a case study in which to test the hypothesis that different marketing strategies can cause differences in site quality. The method of approach used in testing the hypothesis has been to compare a sample of typical major company stations with the population of price-cutter stations in the city of Vancouver.

Nature of the Vancouver Gasoline Market

Vancouver's gasoline retail market is remarkably similar to the one described in the preceding section. The Royal Commission on Gasoline Price Structure in British Columbia (Morrow, 1967) and the study of Service Station Turnover in the Lower Mainland (Warren & Wong, 1961) reveal no outstanding dissimilarities between the Vancouver market and the North American market. One important exception to this statement, however, is the fact that price-cutters in Vancouver control a relatively high proportion of the market. As far as can be ascertained, Fort Lauderdale, Florida is the only market in North America where price-

cutters sell a higher proportion of gasoline than in Vancouver.¹

This similarity did not always exist. In the period 1934 to 1951 British Columbia imposed government regulations on the oil industry. However, "the experience was unsatisfactory - investment fell off, service deteriorated, price competition ended - and the idea was abandoned" (Fleming, 1966, p. 77).²

By 1961 the industry appears to have assumed a posture closely resembling one that normally occurs throughout the rest of North America. Warren and Wong (1961) indicate that a system of price leadership was well established by this date. They state that in British Columbia "prices of petroleum products are generally considered to be administered by the seller" (pp. 4-5). This fact was re-established two years later by a Royal Inquiry appearing before Judge William Morrow:

A word that was introduced early in the hearings was 'oligopoly' and it was suggested by some that it had a sinister meaning. Perhaps it is an over-simplification to state that it merely means leadership by a few or one in any named industry; and when there is a price change by the leader, there will be an early response by others in the same industry. It is a fact that in British Columbia there is a recognition of mutual dependence. In a situation such as we have in the industry in British Columbia, price leadership is found to be present. (1967, p. 126)

¹Interview with Mr. Cliff Goddard, Regional Manager, Imperial Oil (1970).

²Government regulation of the petroleum industry has occurred in only one other place in North America; Nova Scotia, 1933-1950.

Judge Morrow goes on to define even more precisely price leadership as is evidenced by the findings.

So, then, price leadership could, perhaps, be best described as a situation where some company in each territory must accept the onus of formally recognizing current conditions and if it makes any errors it will soon lose its position as the price leader. By the same reasoning, I do not mean to say that a price leader can set prices at his own pleasure and force other marketers to conform. (1967, p. 126)

Although Judge Morrow (1967) claims that evidence does not point to a single price leader (p. 126), he does mention earlier in the report that "it would appear that Imperial (which includes Home) has the largest share of the total market and has presumably become the price leader in the gasoline operations in British Columbia" (p. 27).³ A 1967 consumer survey reveals the approximate market percentages of each company in the Vancouver area (Figure 5).

The gasoline studies also reveal that a number of independent stations operate outside the general structure of price leadership. Warren and Wong (1961) state that the "independents are in a position to operate on a cut-price basis because of the fact that their service offerings are restricted Thus these cut-price operators have a decided price or margin advantage and use this as a competitive weapon" (p. 11). They also report that 8 to 10 per cent of the gasoline market in the Vancouver

³Gallage sales of individual companies or stations do not appear at any point as public evidence in the proceedings. As a rule, the major firms regard this knowledge as competitive advantage and are thus reluctant to reveal such figures. It is for this reason that the author was not able to secure data on the total sales volume of individual companies.

| | Metropolitan* Vancouver | British** Columbia | Canada*** |
|----------|----------------------------|-----------------------|-----------|
| Imperial | 25% | 23% | 30% |
| Home | 7% | 7% | 2% |
| Chevron | 14% | 11% | 2% |
| Standard | 9% | 7% | 2% |
| Shell | 20% | 17% | 15% |
| Gulf | 12% | 14% | 12% |
| Royalite | 2% | 4% | 3% |
| Texaco | 6% | 10% | 12% |

FIGURE 5: 1967 Consumer survey asking the question, "What brand of gasoline do you usually buy?"⁴

(Source: Canadian Daily Newspaper Publishers Association)

* 451 respondents
 ** 2,044 respondents
 *** 13,938 respondents

⁴One should not regard these results as accurately representing the market share of each company. They are at best only crude indications.

area belongs to the independents and that this share is increasing. More specifically the Morrow Report states that private branders⁵ only operated 4.9 per cent of the service stations in Metropolitan Vancouver and 2.2 per cent of the total number in the province but accounted for 9.7 per cent and 5.7 per cent respectively of total gasoline sales. As indicated by the figures Morrow concluded that the average gallonage per station for the independents was greater than that for the majors. He also took pains to point out however, that Woodward's, Simpsons-Sears, Hendersons, and Dominion had exceedingly high volumes of sales (1967, p. 65).

Both the Royal Inquiry and study by Warren and Wong indicate that the price differential between independent stations and major stations was 2¢ per gallon. "It has been the general practice of independent non-branders and private branders to keep within approximately 2 cents per gallon of the general price level of the strong major brands. With such a differential, these operators experience a satisfactory volume of sales and in the short run, do not appear to seriously interfere with the markets of major suppliers so as to invite price retaliation" (Warren & Wong, 1961, p. 10).

The major companies often create the conditions necessary for the entry of cut-rate stations into the market. This occurs when a major oil manufacturer has an excess refinery capacity and tries to get rid of its surplus by selling large quantities of gasoline to independent dealers at a

⁵Private branders is a term synonymous with price-cutters.

very low price. An example of this happened in 1957 when the cut-rate gasoline dealers got into production in the Vancouver market. "This was the time when B. A. Oil had built a new refinery in Port Moody and over-produced gasoline to a point where they had to dump it to get the other by-products. The result was that in about eight years the cut-raters in B. C. took 13 per cent of the gasoline retail market away from the huge corporate oil companies."⁶

Another indication of the lack of direct price competition is the fact "that service station operators did not seem to know the prices charged by their competitors" (Morrow, 1967, p. 54).

Both studies also indicate that it is only a certain segment of the market that frequent price-cutters. "While there was a diversity of prices . . . the evidence indicated a lack of awareness of this diversity by motorists and even by dealers (Morrow, 1967, p. 55). But, Morrow also says that "some motorists will buy non-brand gasoline even at a price differential of only 1¢" (p. 67).

The Royal Commission also probed the question of credit cards. Imperial Oil made the claim that the credit card "is a service provided for competitive reasons and it is evident that a large and growing proportion of all retail customers desire to have it" (Imperial Oil, 1967, p. 14). Morrow's findings indicated that the average cost of credit cards is about 1/2¢ per gallon of total gasoline sales of service stations and about 1-1/2¢

⁶Information from a letter from Mr. Ron Marcoux of McCan Franchises, 1970.

per gallon of credit card sales. Although this means that non-credit card users are paying for the convenience derived by those who use a credit card, Morrow admitted that there was very little that could be done to correct the situation.

The discussion thus far would seem to demonstrate the fact that Vancouver's gasoline market is very similar to those observed elsewhere. The following tables will give a more detailed picture of the present situation in the city of Vancouver.⁷

Table 1 lists, under the headings of 'price competitors' and 'non-price competitors,' all the major, subsidiary, and independent firms operating in the City of Vancouver. Table 2 gives a breakdown of a total number of 340 non-price competitors according to company ownership. These stations pump an estimated 69,621,000 gallons of gasoline. Table 3 gives a similar breakdown for the 20 price competitor stations but also includes some percentage figures on gallonage share of the market. Price competitors pump an estimated 10,870,000 gallons and control approximately 15.61 per cent of the market.

A few minor differences are also evident in the market.

Observation has shown that price-cutters do not employ the tactic of "screaming" signs. Although this may be due to some extent to city zoning

⁷Since 1966 the effects of restrictive zoning has come to play a part in the gasoline industry of Vancouver. Since zoning does not bear directly on the company's 'choice' of strategy (as it presently stands), this topic will be discussed at a later date.

TABLE 1

Gasoline Retail Firms in Vancouver Market

Price CompetitorsNon-Price Competitors

Mohawk Oil Co. Ltd.

Pay-N-Save Petroleums

Woodward's

Cal Van Auto Supply

Dominion Vancouver Motors

Cardinal Car Wash

Hayward Petroleum

Merit Oil

Econo.....Home Oil*..... Imperial Oil (Esso)

(owned by)

Royalite*.....

(owned by)

Gulf Oil

Shell of Canada

Standard of B. C.**

Texaco

Union Oil Co.

Pacific 66

* non-price competitors

**company operated stations are known as STANDARD while dealer
operated stations are designated as CHEVRONTABLE 2

Non-Price Competitors (1970)

| Company | Number of Stations | % of non-price competitor stations | % total stations |
|------------|-----------------------|---------------------------------------|---------------------|
| Chevron | 78 | 22.9 | |
| Standard | 7 (85) | 2.0 (25.0) | (23.6) |
| Gulf | 67 | 19.7 | 18.6 |
| Shell | 50 | 14.7 | 13.9 |
| Esso | 49 | 14.4 | 13.6 |
| Home | 33 | 9.7 | 9.2 |
| Texaco | 28 | 8.2 | 7.8 |
| Royalite | 15 | 4.4 | 4.2 |
| Pacific 66 | 9 | 2.7 | 2.5 |
| Union 76 | 4 | 1.2 | 1.1 |
| | 340 | 100.0 | 94.12 |

TABLE 3

Price Competitors (1970)

| Company | Number of stations | % of price competitor stations | % of total stations | % sales of price competitor market | % sales per station in price competitor market |
|--------------|--------------------|--------------------------------|---------------------|------------------------------------|--|
| Mohawk | 7 | 35.0 | 1.94 | 15.92 | 2.27 |
| Pay-N-Save | 4 | 20.0 | 1.18 | 15.27 | 3.82 |
| Econo | 2 | 10.0 | .56 | 14.44 | 7.22 |
| Woodward's | 2 | 10.0 | .56 | 26.31 | 13.15 |
| Cal Van Auto | 1 | 5.0 | .28 | 5.70 | 5.70 |
| Haywards | 1 | 5.0 | .28 | 4.97 | 4.97 |
| Merit | 1 | 5.0 | .28 | 8.00 | 8.00 |
| Dominion | 1 | 5.0 | .28 | 7.91 | 7.91 |
| Cardinal | 1 | 5.0 | .28 | 1.47 | 1.47 |
| TOTAL | 20 | 100.0 | 5.88 | 100.0 | |

regulations, the average price-cutter's sign is far less visible than it might be. This is especially true in the advertisement of price differentials. It was also observed that a few stations operate on a price differential of 4¢; a full 2¢ below their direct competitors.

Although price competitive stations account for only 5.88 per cent of the total number of outlets their sales represent 15.61 per cent of the market share. Such a large share of the market is more the exception than the rule in other North American markets. Several company officials indicated that the market controlled by independents was only 12 per cent. This may be due to the fact that they were considering Metropolitan Vancouver as well as leaving out Econo which is controlled by Imperial. Such a statement would then seem in order..

Little difference in the major brand stations is evident, except for the fact that they appear to be of a generally lower quality than those elsewhere. However, empirical tests should be made in order to confirm this statement. Although Cassady and Jones (1951) claim that there is usually a direct correlation between the number of stations a firm has in a specific market and that firm's share of the market, this situation does not exist in Vancouver. Standard has more stations (85) than does Imperial/Home (83) but Imperial appears to have a considerable edge in market share.

Summary. Except for the fact that a relatively large proportion of the market is controlled by price-cutters, the Vancouver gasoline market is very similar to gasoline markets elsewhere. The marketing strategies

employed in Vancouver are the same as those used in other areas. Major brand companies use the strategies of product differentiation and convenient location to attract customers, while the independent dealers use the strategy of price to appeal to a specific market segment.

Outline of Analysis

In the California study both gallonage and survival ratio were used as overt measures of performance (Claus, 1969, p. 28). In Vancouver, however, gallonage as a measure of performance was used exclusively. This was necessitated because the survival ratio as a performance measure would have been meaningless in the present circumstances. As was noted earlier, independent price-cutters have only moved into the market since 1957 when there was a glut of excess gasoline available. This is hardly enough time for a normal market situation to evolve and mature. There is also the fact that Vancouver City Council has initiated a conscious policy of preventing the birth of new stations in the market place. This policy has its origins in the Morrow report of 1967 which recommended a "rest" in the building of service stations for at least five years. Not only does this government intervention prevent the birth of new stations but it also prevents the death of old ones. Oil companies are reluctant to close out old, outdated and poorly located sites for fear that permission to build a new station in its place will not be granted. The fear of losing income by shutting down a station forces the oil companies to maintain sites that would normally suffer a natural death in the market place.

Quality ratings for each station were obtained by using a site

rating instrument similar to the one developed by Claus (1969). A non-parametric correlational analysis was then performed on the data to discover if there were any significant relationships between site quality and the marketing strategy used by the two groups of marketers. Figure 6 illustrates the three stage model used in the data analysis.

An examination of the correlational matrixes produced by the three stages reveals marked differences in the qualitative requirements for the two types of marketing strategy employed in the Vancouver market.

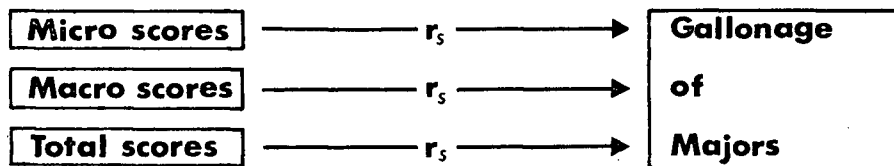
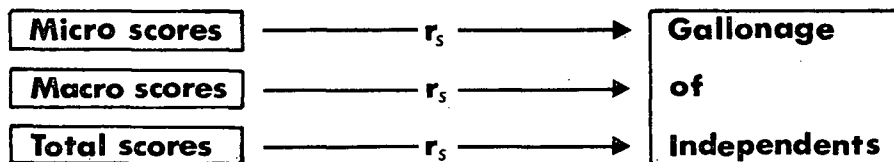
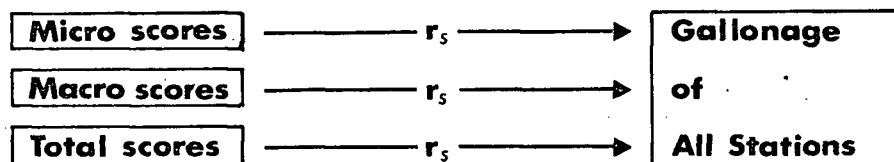
A small case study, examining three service stations in close proximity to one another, was also performed in an attempt to gain further insight into the actual effects of different strategies on the landscape.

Sampling Procedures

To reduce the effects of zoning regulations as an intervening variable in the experiment,⁸ the sample of stations was selected from a single political area; the City of Vancouver. In this way all the stations in the study would be influenced to the same degree by zoning by-laws. As was pointed out earlier, government regulations can often drastically affect the quality of a particular retail site.

In order to secure a sample of major company service stations with their respective yearly gallonages, four major oil companies

⁸As was noted in Chapter 2, zoning regulations, fire codes, etc., can greatly affect the quality of a retail site. To test for qualitative differences between sites, the effect of governmental intervention must remain constant.

STAGE 1**Major Stations****STAGE 2****Independent Stations****STAGE 3****All Stations**

$$r_s = \frac{6 \sum d_i}{N^3 - N}$$

FIGURE 6.**THREE STAGE MODEL OF CORRELATIONAL ANALYSIS**

controlling 69.7 per cent of all stations in the Vancouver market were asked to participate in the experiment. It was felt that these four companies adequately represented the general market of major company stations. Each of these four companies were asked to supply a list of stations that fell within the median range of yearly gallonages for their particular company. From each company's list, six stations were chosen at random producing a sample of 24 stations. After rating the whole sample, one station had to be eliminated because of peculiar circumstances in that station's immediate area.

It was hoped that by this procedure a sample of typical major company service stations could be established. Since the major company stations were only to be used as a comparative measure it was not necessary to take a random sample of all major stations in the area. This procedure would not only be very time consuming, but it would also produce a much higher variance within the comparison group. Problems would have also been encountered with the oil companies, as they are generally reluctant to relinquish gallonage figures on individual stations. Although they were co-operative in supplying gallonage figures for six stations, asking for 20 or 30 such figures would have only met with refusal. The sample that was eventually selected appeared to be very homogeneous and represented the average gallonage service station for major companies.⁹ The original number of 24 sample stations was chosen because it was very

⁹In Vancouver, in 1969 the average major company gasoline service station pumped 210,000 gallons. The average gallonage for major stations in the study sample was 223,000 gallons.

close to the number of price-cutters in the same market area.

Table 4 gives figures for the mean, median, and range of gallonages for major and independent stations.

TABLE 4

Mean, Median, and Range of Gallonages for Major and Independent Stations in the Vancouver Study (gal./yr.)

| Type of Station | Mean | Median | Range |
|---------------------|---------|---------|---------------------|
| Majors (N=23) | 223,000 | 220,000 | 140,000 - 350,000 |
| Independents (N=20) | 450,000 | 545,000 | 100,000 - 2,100,000 |

The population of independent price-cutter stations in the Vancouver market totalled 20 at the time of the study. Because the independent companies were reluctant to participate, it was necessary to obtain their gallonage figures from a number of other sources including interviews with station operators, estimates from competitors, and figures given by suppliers. Cross checks on estimated gallonages revealed few discrepancies.

Table 4 reveals that the range of gallonages for the price-cutters is much larger than for the sample of major stations. This was anticipated since the sampling procedure used in selecting major stations was done in order to reduce the variance. The Table also reveals that the average price-cutter pumps more than twice as much gasoline as does the average major station. This was also anticipated, since the price-cutter must pump more gasoline than major stations just to break even. This is necessary because of the lower prices charged by the independents and

because the independents do not receive much income from backroom work, TBA, and other services.

Marketing Strategies

The four largest companies participating in the study were Imperial, Gulf, Shell, and Standard. All are considered to be "major" oil companies, each controlling at least two per cent of the North American market and in the case of Vancouver, each one controlling more than ten per cent of the market. These companies also sponsor national advertising as well as operating a national credit card system.

To investigate even further each company's retailing practices in Vancouver, marketing personnel for each company were interviewed and asked the following questions:

1. Do all your Vancouver stations sell gasoline at the same price?

All companies answered no to this question; however, all four qualified their statements saying that the final retail price was determined by the dealer. It was also stated that the companies tried to maintain a fairly uniform price among their brand stations.

2. What is the range in price for your brand of gasoline in Vancouver?

All replied that 1¢ to 2¢ was the usual range but that occasional exceptions did occur, again depending on the individual dealer.

3. Do your stations participate in contests, games, give-aways, bonuses, reduced merchandise, etc.?

All companies answered yes, saying that from time to time their

stations did engage in such practices. They all considered such promotional devices as standard marketing procedure, stating that these were usually associated with a national or regional advertising campaign and thus ran for only a limited span of time.

4. Do your stations usually sell gasoline at the same price as other majors?

The standard answer to this question was that their stations usually met the price of the largest competitor resulting in a fairly uniform price throughout the market.

5. Do some stations in the market continually sell gasoline at a price lower than your company stations?

The answer was a unanimous yes. The term non-brander, price-cutter, or independent was frequently used to describe these stations.

6. How much lower?

Depending on the station, all responses indicated that price-cutters usually sold gasoline for 2¢ to 4¢ below the "normal" market price.

7. Could you supply a list of these stations?

All four companies had a list of so called 'non-branders' along with each station's estimated gallonage for 1969. Two companies generously supplied the author with a copy of their lists. Another company maintained a map of all non-brand stations with their estimated gallonages. The fourth did maintain a list but was reluctant to reveal it to the author. The two lists received as well as the map matched up perfectly regarding the name and location of non-branders and deviated only slightly in estimated gallonages. When questioned further about specific independent stations, all

marketing personnel were readily familiar with each station's operating procedures.

8. What percentage of the Vancouver market do non-branders or price-cutters control?

Answers ranged from 11 per cent to 15 per cent, but some were qualified as referring to metropolitan Vancouver rather than the City of Vancouver.

Interviews with the companies would seem to indicate that they follow a practice of price leadership in the Vancouver market; however, minor fluctuations in price of gasoline do occur because of individual dealers. This confirms Judge Morrow's findings of 1967. Although games, bonuses, give-aways, etc., may be regarded as a form of price-cutting, this also seems to be fairly uniform among all companies studied and would therefore not create a lasting price differential. It would also appear that the companies interviewed recognized price-cutting as a different form of marketing strategy. Although the majors themselves did not follow this practice they were acutely aware of those who did and were fully informed on all such operations.

Field observation in 1970 of the sample of major company stations revealed an average price of 45.9¢ per imperial gallon for regular gasoline and 50.9¢ per gallon for premium. Price deviations for regular gasoline occurred only in four instances where a differential of 1¢ was observed. Premium gasoline revealed six deviations and ranged from 1¢ to 3¢. The general differential between regular and premium was 5¢ per gallon,

although this tended to be smaller where deviations did occur.

Observation of non-brand stations showed that their prices fluctuated more than the major stations. The average price of regular was about 42¢ per gallon although it did drop to 40.9¢ in one instance and went as high as 44.9¢ in another. The average price of premium gasoline was about 45¢ ranging from 42.9¢ to 47.9¢. The differential in price between regular and premium gasoline for non-brand stations appears to be 3¢ to 4¢ per gallon. Price-cutters also use coupons, bonuses, give-aways, reduced merchandise, etc. Merit Oil has a system of coupons, while Cal Van uses a gasoline discount method. The Econo stations have a wide range of discounted merchandise including gardening supplies, lawn furniture, and recreational goods.

Interviews with independent dealers reveal that 70 to 80 per cent of their business is from repeat customers. Because of this, the yearly cycles of business for independents and majors are reversed. The independents' best month for gasoline is December when there is traditionally a lot of shopping and local visiting to be done. Major companies, on the other hand, report the summer months of July and August as their best season. This shows that they have many one stop customers who are merely passing through.

As a rule independent stations have lower marketing expenses than major company stations (Figure 7). Even though their expenses are lower, the independents must maintain a higher required marketing

INDEPENDENT AND MAJOR COMPANY SERVICE STATION EXPENSES

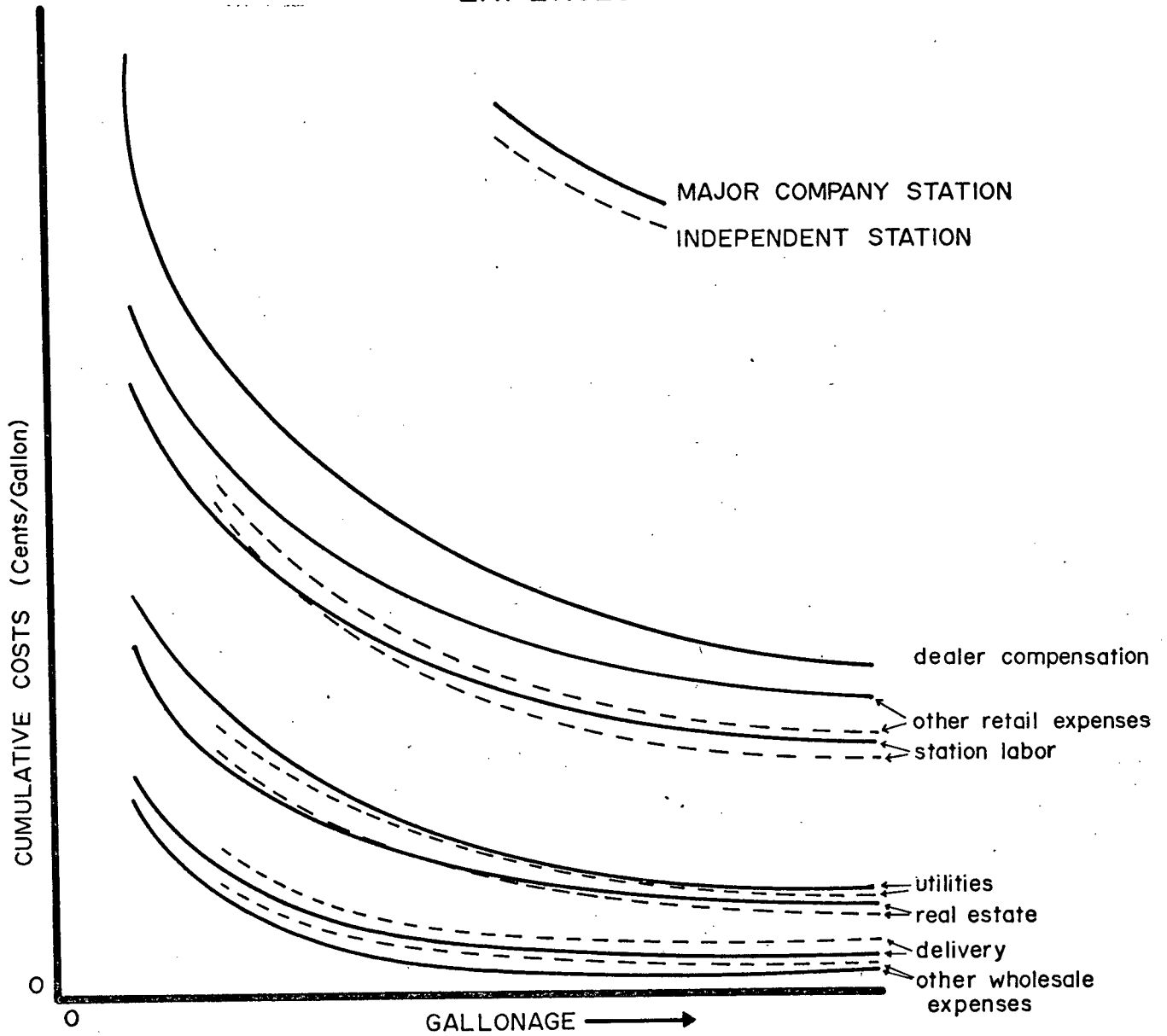


FIGURE 7.

margin.¹⁰ This is true because: 1) independent stations have lower non-gasoline gross profits; 2) independents have a lower ratio of premium/regular gasoline sales. They also receive less for the premium gasoline they do sell. With 40 per cent premium sales at a 3¢ differential the major company will make 1.2 cents/gallon profit while the independent is likely to receive only 30 per cent premium sales at a 1¢ differential and make .3 cents/gallon profit; 3) because independent stations usually sell gasoline 2¢ to 4¢ below standard prices they must make up the difference by increased gallonage or lower overhead.

In general it can be said that in Vancouver the major companies follow a system of price leadership and do not actively compete through price but use other less direct marketing tactics to attract customers. The non-brand stations, on the other hand, use price as a competitive weapon and sell gasoline for 2¢ to 4¢ per gallon below the price set by the major firms.

Development and Application of Site Rating Instrument

To establish a quality rating score for each service station in the study, a site rating instrument very similar to the one developed by Claus was employed. Experience in California suggested that Brick's original system (see Chapter 2) of weighting site variables (which had been designed to accommodate the New Jersey market) might be modified to

¹⁰Required marketing margin is the marketing margin which an individual station must have to recover all costs including charges on real estate.

give a more accurate prediction of gallonage.¹¹ A new rating schedule of reweighted variables is shown in Figure 8. This new schedule has been used to rate gasoline service stations in California and is the one employed in the present study. The modified rating schedule also has the added advantage of being in whole numbers rather than decimals, thus facilitating rapid field calculations.

To test for any significance between the two systems of weighted variables both schedules were used in rating the sample of 23 major company stations. Since Brick's original instrument was developed solely for the rating of major company stations, it was felt that the best comparison could be obtained by examining only major stations. Because of the nature of the data (which will be explained later in this chapter) a nonparametric correlational analysis was performed.

The micro, macro, and total rating scores for Brick's schedule and the reweighted schedule, as well as the gallonages for all stations, were ranked in descending order. A correlational analysis between gallonage and site rating scores was then performed using Spearman's rank correlation coefficient as defined by the statistic:

$$r_s = 1 - \frac{6 \sum_{i=1}^N d_i^2}{N^3 - N}$$

¹¹For a fuller discussion of regional differences in the relative importance of site rating variables and their weightings see Claus (1969).

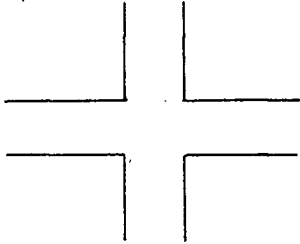
| | | | | | | |
|---|--|----|----|----|----|---|
| Name: _____ | MICRO-LOCATIONAL ASPECTS OF SERVICE STATIONS | | | | | |
| Address: _____ | Station Design and Facilities | 10 | 8 | 6 | 4 | 2 |
| | Layout (Size and Shape) | 10 | 8 | 6 | 4 | 2 |
| Gallorage: _____ | Placement as to Traffic Flow | 20 | 16 | 12 | 8 | 4 |
| | Visibility | 10 | 8 | 6 | 4 | 2 |
| Linear: _____ | Grades of Arteries and Streets | 5 | 4 | 3 | 2 | 1 |
| Zone of Conflux: _____ | MACRO-LOCATIONAL ASPECTS OF SERVICE STATIONS | | | | | |
| Rating: _____ | Local or Neighborhood | | | | | |
| ILLUSTRATION OF SITE  | Threshold | 10 | 8 | 6 | 4 | 2 |
| | Incomes in and/or Type of Area | 5 | 4 | 3 | 2 | 1 |
| | Area Growth Characteristics | 10 | 8 | 6 | 4 | 2 |
| | Location as to Dominant | | | | | |
| | Threshold | 5 | 4 | 3 | 2 | 1 |
| | Traffic Threshold Potential | 10 | 8 | 6 | 4 | 2 |
| | Stations' Density Ratio | 5 | 4 | 3 | 2 | 1 |
| | 100 | 80 | 60 | 40 | 20 | |
| COMMENTS: _____ | | | | | | |

FIGURE 8: Performance Rating Guide: Service Station and Service Station Site

where r_s = correlation coefficient

d_i^2 = the squared difference between paired ranks

N = the number of observations

Table 5 gives the results of the above analysis. The r_s statistic has not been corrected for ties in this case because equal numbers and equal magnitudes of ties existed in both sets of data and would therefore not effect a comparison of the two schedules.

TABLE 5

| <u>Scales</u> | <u>Brick's Schedule</u> | <u>Reweighted Schedule</u> |
|---------------|-------------------------|----------------------------|
| Micro | .72 | .70 |
| Macro | <u>.08</u> | <u>.07</u> |
| Total | .81 | .83 |

The correlational analysis reveals that there is little difference between the two site rating instruments. It can be concluded then, that in this instance, the reweighted schedule is at least as effective as Brick's original system of weighted variables.

Because of the limited sample size (23) and the inconclusive results, it would be unfair to say that either one of the rating instruments was superior in the Vancouver market.

Data Collection

The basic data used in the analysis consisted of: 1) gallonage figures for each station during 1969, and 2) quality rating scores for each station.

As was explained earlier the gallonage figures for the major company stations were obtained directly from the companies themselves. Gallonage data for non-brand stations was received from a number of other sources.

Quality rating scores were obtained by rating each station in the study using the instrument as shown in Figure 8. A full description of the use and application of this site rating guide, plus a supplementary questionnaire, can be found in Claus and Rothwell (1970). This publication stemmed from a pilot study of a number of service stations of known gallonage conducted in the winter of 1969-70 by Dr. R. J. Claus and the author. The purpose of this study was to become more familiar with the gasoline service station industry of Vancouver and to train the author in the proper use of the site rating instrument. Extended discussions were held on the effects that each locational variable had on the total rating score. The eventual outcome of the training and study resulted in the development of the quality rating schedule used in this thesis.

When the practice ratings in the pilot study were completed, Dr. Claus and the author independently rated the service stations selected for the present study. To establish some measure of inter-rater reliability, Spearman rank correlations were run between the two sets of micro, macro, and total scores. Table 6 reports the results.

The high r_s values of .94, .84, and .94 for correlations between identical measures would seem to indicate a fairly high degree of inter-rater reliability.

TABLE 6

Spearman Rank Correlations Between Independently Rated
Micro, Macro, and Total Scores for all Stations

| Rater No. 2 | Rater No. 1 | | |
|-------------|-------------|------------|------------|
| | Micro | Macro | Total |
| Micro | <u>.94</u> | .20 | .84 |
| Macro | .21 | <u>.84</u> | .43 |
| Total | .81 | .46 | <u>.94</u> |

The Table also indicates that a strong relationship exists between micro subscores and total scores for both raters.

Statistical Procedures

After examining the raw data it was decided that nonparametric tests would be used in the statistical analysis. This was done for a number of reasons. Difficulties in parametric analysis would have arisen from the fact that one group of stations, i.e. the majors, comprised a sample while the other group, the independents, made up the entire population. Both the sample of major stations (N = 23) and the population of independents (N = 20) were too small to meet the power-efficiency requirements of most parametric tests. Variables involved in parametric tests must also be measured in an interval scale. This requirement, however, could not be conclusively demonstrated for the variable scores in the site rating instrument. Additional to this is the fact that the sampling procedure for the selection of major company stations was not entirely random. Because of this and because of the small sample size, it was suspected that the data

was not normally distributed, another requirement of parametric tests. To discover the shape of the data distribution, chi square goodness-of-fit tests were run on the data to test for normal, binomial, poisson, and negative binomial distributions.¹² The chi square tests were applied to the micro, macro, and total scores plus the gallonage figures for both the major and independent stations. Results revealed that the data failed the test for normality in every instance and only occasionally did it fit other distributions. Because of the data's failure to consistently fit any distribution a method of data transformation was also ruled out. The Kolmogorov-Smirnov one-sample goodness-of-fit test was also considered for testing data normality. The Kolmogorov-Smirnov test, however, is even more powerful in discriminating distributions than the chi square test; thus if the data failed the latter it would by definition also fail the former.

The conclusion reached after examination of the data, was that nonparametric statistics should be used. Unlike parametric tests, nonparametrics do not specify conditions about the parameters of the population from which the sample was drawn. Siegel (1956, pp. 32-33) outlines both the advantages and disadvantages of nonparametric statistics. Some of the advantages are: 1) "Probability statements obtained from most nonparametric statistical tests are exact probabilities (except in the case of large samples, where excellent approximations are available), regardless of the

¹²Although there was initial hesitancy about employing a chi square test, because of the smallness of the samples, consultation with Dr. A. Kozak of the U. B. C. Department of Forestry revealed that the test was indeed powerful enough to properly discriminate distributions even at the present sample size.

shape of the population distribution from which the random sample was drawn" (p. 32); 2) For very small sample sizes there is no alternative to using nonparametric statistical tests unless the population distribution is known exactly; 3) Nonparametric tests are available for treating samples made up of observations from several different populations. The assumptions of parametric tests cannot handle such data. 4) Data that is by nature non-interval, ordinal, or nominal can be handled by nonparametric statistical tests. Most nonparametric tests require only ordinal or ranked data.

Some of the disadvantages are: 1) In comparison to parametric tests that meet all the data assumptions, nonparametric tests are wasteful of data. That is to say, the power-efficiency of nonparametric tests is not as high as for parametric ones. As Siegel (1956) records, however, this is not always the case; in fact, certain nonparametric tests can be more powerful than parametric tests, e.g. Mann-Whitney U test versus parametric t test (p. 126); 2) No nonparametric statistical method is available for testing interactions in the analysis of variance, unless special assumptions are made concerning additivity. This aspect is of no consequence in the present experiment as analysis of variance tests are not required to process the data.

The nonparametric statistical test used most often in the study is Spearman's rank correlation coefficient, r_s . It is used here as an alternative test to the Pearson product moment correlation coefficient, r . As was mentioned earlier Spearman's r_s uses ranked data and is defined by the statistic:

$$r_s = \frac{1 - \frac{6 \sum_{i=1}^N d_i^2}{N^3 - N}}{1}$$

where r_s = correlation coefficient

d_i^2 = squared difference between ranks

N = number of observations

For tied observations, each rank is assigned the average of the rank which would have been assigned had no ties occurred. "If the proportion of ties is not large, their effect on r_s is negligible" (Siegel, 1956, p. 206). When the proportion of ties is large however, the following correction formula may be used:

$$r_s = \frac{\sum x^2 + \sum y^2 - \sum d^2}{2 \sqrt{\sum x^2 \sum y^2}}$$

where

$$\sum x^2 = \frac{N^3 - N}{12} - \sum T_x, \quad \sum y^2 = \frac{N^3 - N}{12} - \sum T_y$$

and where

$$T = \frac{t^3 - t}{12}$$

t = number of observations tied at a given rank

The normal effect of tied ranks is to inflate the value of r_s so that the application of the tied ranks formula will tend to reduce the correlation coefficient value. In all the Spearman correlations that were done for this study the maximum effect of tied ranks occurred in the macro subscores of the site rating instrument. The ultimate effect of the tied rank formula was to reduce r_s by .02. In no instance did the correction for tied ranks influence the statistical significance of the correlation values.

The power-efficiency of the Spearman rank correlation when compared to the most powerful parametric correlation, the Pearson \underline{r} , is about 91 per cent (Siegel, 1956, p. 213).

Kendall's rank correlation coefficient, τ (tau), was also considered as a replacement for the Pearson \underline{r} . Although τ is as powerful as r_s (both having an efficiency of 91 per cent), the Kendall method is computationally more time consuming, especially for $N > 10$, than Spearman's statistic. Even though both methods are equally as powerful in rejecting H_0 , τ and r_s have different underlying scales and numerically they are not directly comparable to each other. To use them both in the same analysis would only confuse the reader who was unaccustomed to the comparable scaling of these two statistics.

Guilford (1965, p. 307) in a discussion of correlation statistics says that r_s is numerically closely equivalent to the Pearson \underline{r} . On the average \underline{r} is slightly greater than r_s , the maximum difference being approximately .02 when both are near .50. Kendall's τ , however, deviates much more and cannot be considered directly comparable to the product moment correlation coefficient or the rank correlation coefficient.

Description of Data

A histogram of yearly station gallonages for both the major stations and the price-cutters is shown in Figure 9. Frequencies were calculated for interval widths of 100,000 gallons.

Although 83 per cent of the major stations and 45 per cent of the

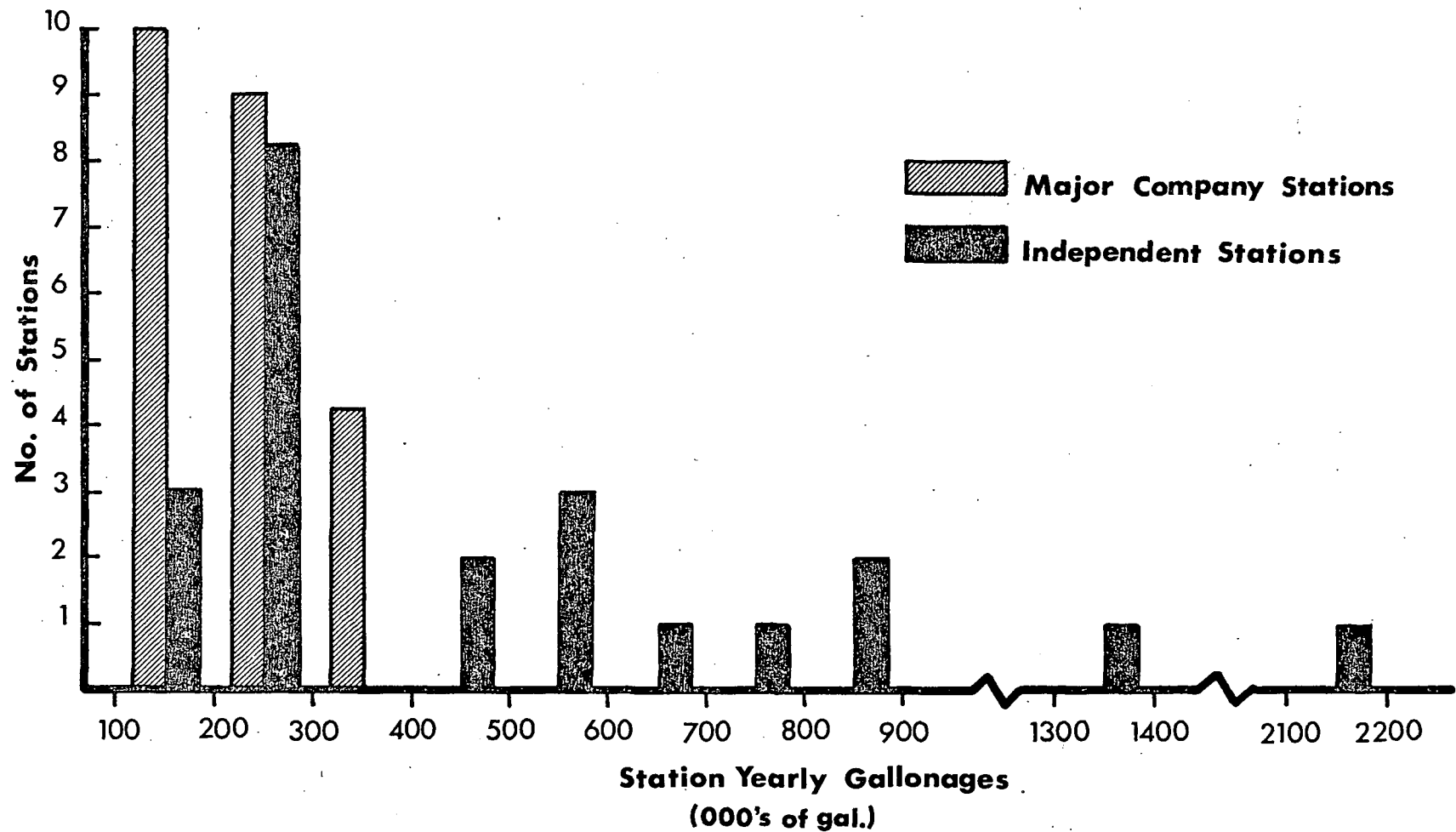


FIGURE 9.
HISTOGRAM OF YEARLY GALLONAGES FOR ALL STATIONS

independent stations pump less than 300,000 gallons, the distribution of gallonages is far from being normal. This visual representation confirms the findings in the previous chapter.

The site rating scores for both groups of marketers were also plotted. The bar graph in Figure 10 shows the mean micro, macro, and total scores for the independent and major stations. It can be seen that the average major station scored a full 11 points more in total score than its independent counterpart. This difference is directly attributable to the higher micro ratings received by the major company stations. The average difference in macro ratings accounted for only 1.3 points of the eleven point differential.

In general, it can be seen that the major company stations received higher ratings on the micro scale than the independents, while the macro rating for both groups remained relatively equal. It would be well to recall at this time, that the micro variables are designed to measure the gallonage performance of a station. In terms of gallonage, then, a high micro rating indicates a high quality station. The qualitative difference between service stations occurs because of differences in such things as facilities, layout, design, visibility, etc., i.e. INSV features (see Chapter 2).

In the case of the independents, a lack of facilities and service does not mean a loss of gallonage. As it has already been shown (Table 4), the average price-cutter pumps twice as much gasoline as the average major.

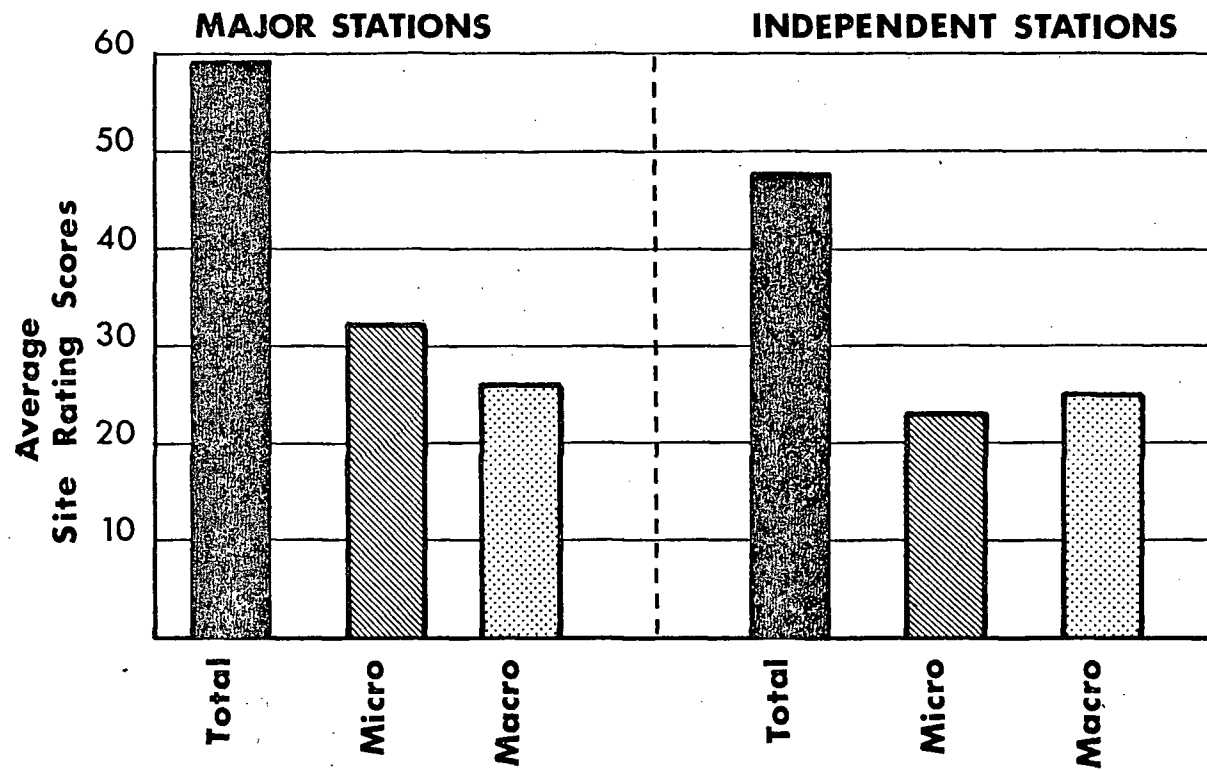


FIGURE 10.

SITE RATING SCORES FOR MAJOR AND INDEPENDENT STATIONS

To discover more about the nature of the raw data a series of Mann-Whitney \underline{U} tests (M-W \underline{U} tests) were performed. The M-W \underline{U} test may be used to test whether two independent groups have been drawn from the same population. "This is one of the most powerful of the nonparametric tests, and is the most useful alternative to the parametric t test" (Siegel, 1956, p. 116). The usual null hypothesis is that A and B have the same distribution, i.e. $H_0: \xi A = \xi B$; while the alternative hypothesis is that one group is stochastically larger than the other, i.e. $H_1: \xi A > \xi B$.

The M-W \underline{U} test is defined by the statistic:

$$U = n_1 n_2 + \frac{n_1 (n_2 + 1)}{2} - R_1$$

where n_1 = number of observations for the smaller group

n_2 = number of observations for the larger group

R_1 = sum of ranks assigned to group whose sample size is n_1

For the M-W \underline{U} test, the general rule is that $n_1 \leq n_2$. When $n_2 > 20$, which is the case in this experiment, the sampling distribution of \underline{U} rapidly approaches the normal distribution with:

$$\text{Mean} = \mu_u = \frac{n_1 n_2}{2}$$

and

$$\text{Standard deviation} = \sigma_u = \sqrt{\frac{n_1 n_2 (n_1 + n_2 + 1)}{12}}$$

The test for significance in the M-W \underline{U} test may be determined by the statistic,

$$Z = \frac{U - \mu_u}{\sigma_u}$$

When $\alpha = .05$ is set as the significance level, H_0 must be rejected if

values of Z are so extreme that their associated probabilities are equal to or less than .05.

The M-W \underline{U} test, like the Spearman statistic, has a correction for tied ranks. Although the mean remains the same, i.e.:

$$\mu_u = \frac{n_1 n_2}{12}$$

the standard deviation assumes the statistic,

$$\sigma_u = \sqrt{\left(\frac{n_1 n_2}{N(N-1)} \right) \frac{N^3 - N}{2} - \sum T}$$

where N = total observations in the two groups ($N = n_1 + n_2$)

$$\sum T = \frac{(t^3 - t)}{12}$$

t = number of observations tied at a given rank

Even when the proportion of tied ranks is high, e.g. 90 per cent, the effect of ties is negligible. Siegel (1956) recommends that "one should correct for ties only if the proportion of ties is quite large, and if some of the \underline{t} 's are large" (p. 126). Both the tied method and the non-tied method were used in analyzing the data in this study. The resulting probabilities differed by no more than .004. The following reported values are for the tied method.

The Mann-Whitney \underline{U} test's power-efficiency as compared to the most powerful parametric test of this type, the \underline{t} test, approach $\frac{3}{\pi} = 95.5$ per cent as \underline{N} increases. For moderate size samples the power-efficiency is usually 95 per cent.

The M-W \underline{U} test was applied to the data for the major and

independent stations to see if the micro, macro, and total scores as well as the gallonage figures were drawn from the same populations. Alternative hypotheses were proposed for each of the four tests on the basis of a priori understanding of the data distributions.

The first test was performed on the yearly gallonage figures. The null hypothesis was that the gallonage distribution for the majors equalled the gallonage distribution for the independents ($H_0: \xi M = \xi I$). The alternative hypothesis was that the gallonage distribution for the major stations was stochastically smaller than the independents ($H_1: \xi M < \xi I$). For 9 per cent tied ranks, the Z statistic yielded a value of +4.942. This represents a probability of .0003, therefore H_0 must be rejected. It can be concluded then, that the two groups of gallonage figures were not drawn from the same population and that independents' gallonages are stochastically larger than the majors' gallonages.

It should be noted that the Z value in this test is positive. In the initial M-W formula for \underline{U} , the value of \underline{R} , represents the sum of the ranks for the smaller sample, i.e. the independents. Since the data is ranked in descending order, smaller R_1 values represent proportionately higher gallonage figures. Because R_1 is a minus value in the \underline{U} formula, smaller values of R_1 will give larger values of \underline{U} . If it happened that the gallonage figures for the independent's were generally lower than the majors, R_1 would be larger and would produce a smaller value of \underline{U} . This smaller value of \underline{U} would in turn be smaller than the mean, μ_u , and would result in a negative value for Z . It can be seen, then, that a positive Z

value indicates the ξI is stochastically larger than ξM .

The same test was performed on the total site rating scores for the two groups of marketers. This time the hypotheses were formulated as follows:

$$H_0: \quad \xi M = \quad \xi I$$

$$H_1: \quad \xi M > \quad \xi I$$

With 28 per cent ties the results produced a Z value of -1.756 and an associated probability of .0392. Again the null hypothesis was rejected with the conclusion that the two distributions were not drawn from the same population and that the total scores for the major company stations were stochastically higher than the total scores for independent stations.

The M-W U test was also applied to the macro ratings to test the hypotheses that:

$$H_0: \quad \xi M = \quad \xi I$$

$$H_1: \quad \xi M > \quad \xi I$$

For 16 per cent tied ranks, the test provided a Z value of -.0497 and an associated probability of .4801. In this case we must accept the null hypothesis that the two distributions were drawn from the same population. Although the Z value is negative, indicating higher macro values for the major company stations, this difference is not significant.

The final M-W U test was performed on the micro ratings to test the following hypotheses:

$$H_0: \quad \xi M = \quad \xi I$$

$$H_1: \quad \xi M > \quad \xi I$$

For 21 per cent tied ranks, the test produced a Z value of -2.057 and an associated probability of .0195. Since H_0 is rejected, it must be concluded that the two distributions were not drawn from the same population and that the micro ratings for the major stations are stochastically larger than for the independent stations.

The rank sum test (Hoel, 1967, p. 252) is very similar to the Mann-Whitney \underline{U} test except for the fact that the R_1 sum is used directly in the calculation of the test of significance:

$$Z = \frac{R_1 - \mu_R}{\sigma_R}$$

where the standard deviation is the same as the \underline{U} test,

$$\sigma_R = \sqrt{\frac{n_1 n_2 (n_1 + n_2 + 1)}{12}}$$

but where the means varies slightly,

$$\mu_R = \frac{n_1 (n_1 + n_2 + 1)}{2}$$

When the rank sum test was applied to discover if there were any differences between two groups of data, the results were exactly the same as the \underline{U} test except that they were all significant at the .01 level, (Table 7).

From the results of the rank sum test and the Mann-Whitney \underline{U} test, it can be seen that the micro scores, the total scores, and the gallonge figures of the major and independent stations were not drawn

TABLE 7

Values of Z , Associated Probability, and Rejection of H_0 for Rank Sum Test Applied to Micro, Macro, Total, and Gallonage Data

| Data | Z | Probability | Reject H_0 |
|-----------|--------|-------------|--------------|
| Gallonage | 2.751 | .003 | Yes |
| Total | -3.944 | .0005 | Yes |
| Macro | -2.141 | .0162 | No |
| Micro | -4.248 | .00003 | Yes |

from the same population. The macro scores, however, do come from the same population.

Because the independent stations operate under different economic restraints than do the major company stations, it was anticipated that their gallonage figures are stochastically larger than the average major company station. As was mentioned previously, lower selling prices, fewer TBA sales, and little backroom work forces the independent stations to pump more gasoline just to remain in business. It is to be expected then, that the gallonage figures for the two groups of marketers belong to two separate populations.

As was anticipated, the micro scores for the major stations were stochastically higher than for the independent stations. This occurs because the major company stations concentrate on accessibility, convenience, and service in order to attract their customers. The independent dealer, on the other hand, uses price to attract his market segment and

tends to disregard the full use of micro facilities. The outcome of this is that the major company stations receive much higher micro ratings than do the independents. The fact that the micro ratings for the two groups of marketers come from different populations would seem to indicate that the quality requirements for the majors and independents should be judged by different criteria. This subject will be broached more fully later in this chapter.

In general, the total scores follow the same pattern as the micro scores. This is expected since the total scores are partially made up of the micro scores. The effect of the macro subtotal on the total score was to lower the value of the Z statistic only slightly. The macro subscores did not have a more pronounced mediating influence on the total scores because their variance was relatively constant.

Although the macro subtotals for the major stations were slightly higher than for the independent stations, the difference was not significant. It can be concluded then, that all the stations in the study were located in roughly similar socio-economic areas of the City of Vancouver.

Internal Consistency of Site Rating Schedule

To measure the internal consistency of the eleven items used in the site rating schedule Cronbach's (1951) alpha was computed.¹³ Alpha is defined by the statistic:

$$\alpha = \frac{n}{n-1} \left(1 - \frac{\sum v_i}{v_t} \right)$$

¹³For Cronbach's alpha applied to Brick's original weightings see Claus, 1969, p. 47.

where n = number of parts (in this case the number of items in the scale)

v_i = variance of one item of a test

v_t = variance of total score

The coefficient α gives a lower bound on the reliability of a composite test having parallel components. The alpha test can be used on each subtest of a composite test. This method is justified when the items within each scale have been selected to measure the same thing. Such is the case for the micro and macro subtests of the quality rating schedule. The five items in the micro subtest are designed to measure site quality in terms of gallonage performance and the six items in the macro subtest are concerned with economic life as a measure of performance.

Application of Cronbach's alpha yielded a value of .89 for the micro subtotal and a value of .63 for the macro subtotal. The coefficient α for the micro scores is considered to be very high and indicates that the micro subtest is very homogeneous. The α value for the macro scores is not as high and thus indicates a lower degree of homogeneity.

Item Validity

To test for item validity Spearman's r_s for tied ranks was calculated between each of the eleven site rating variables for all stations and the micro, macro, and total scores. Table 8 reveals that, in general, the micro variables correlate highly with the micro subtotals but show little significant correlation with the macro subtotals. The reverse pattern is also observed with the macro variables which correlate highly with the macro subtotals and poorly with micro subtotals. As was

TABLE 8

Spearman Correlations of the Eleven Site Rating
Variables with the Three Site Rating Scores For
All Stations (N = 43)

| Variable No. | | Site Rating Scale | | |
|-----------------|----|-------------------|-------|-------|
| | | Micro | Macro | Total |
| Micro Variables | 1 | .81** | .22 | .78** |
| | 2 | .80** | .19 | .77** |
| | 3 | .86** | .30 | .81** |
| | 4 | .78** | .13 | .68** |
| | 5 | .37* | .09 | .34* |
| Macro Variables | 6 | .18 | .77** | .38* |
| | 7 | .26 | .70** | .44** |
| | 8 | .32* | .59** | .38* |
| | 9 | .38* | .47** | .56** |
| | 10 | .26 | .58** | .37* |
| | 11 | .16 | .54** | .31* |

* = $p < .05$

** = $p < .01$

expected, both sets of variables are significantly in correlation with the total scores.

It can be concluded thus, that the splitting of the site rating schedule into micro and macro subscales, as done in the California study, is also justified in the Vancouver market. The item validity test demonstrates that the micro variables measure one aspect of performance while the macro variables measure another aspect of performance. The fact that there is very little intercorrelation between these two groups shows that they are indeed measuring separate things.

The same item validity analysis was done using only major company stations (Table 9), and only independent stations (Table 10). The results indicate that the micro/macro split is applicable even when the market is segmented by different marketing strategies.

Three Stage Correlational Analysis

To investigate the relationship between the site rating scores and gallonage, Spearman rank correlation coefficients were computed using the three stage model of analysis as presented in Figure 6 of Chapter 4. Table 11 reports the results of this analysis.

Stage 1: major company stations. It can be seen that while the micro and total scores are significantly correlated with gallonage, the macro scores are not. It is suspected that the very low value of r_s for the macro scores is due in part to the sampling procedure. It appears that the median gallonage stations for the major companies used in the

TABLE 9

Spearman Correlations of the Eleven Site Rating
Variables with the Three Site Rating Scores For
Major Stations (N = 23)

| Variable No. | | Site Rating Scale | | |
|-----------------|----|-------------------|-------|-------|
| | | Micro | Macro | Total |
| Micro Variables | 1 | .63** | -.19 | .58** |
| | 2 | .58** | -.08 | .59** |
| | 3 | .78** | .07 | .75** |
| | 4 | .61** | -.16 | .42* |
| | 5 | .26 | -.07 | .19 |
| Macro Variables | 6 | .14 | .73** | .40* |
| | 7 | .05 | .78** | .36* |
| | 8 | -.004 | .60** | .15 |
| | 9 | .53* | .30 | .55* |
| | 10 | .31 | .43* | .32 |
| | 11 | -.16 | .70** | .06 |

* = $p < .05$

** = $p < .01$

TABLE 10

Spearman Correlations of the Eleven Site Rating
Variables with the Three Site Rating Scores For
Independent Stations (N = 20)

| Variable No. | | Site Rating Scale | | |
|-----------------|----|-------------------|-------|-------|
| | | Micro | Macro | Total |
| Micro Variables | 1 | .72** | .26 | .69** |
| | 2 | .84** | .15 | .73** |
| | 3 | .82** | .56** | .78** |
| | 4 | .64** | .05 | .58** |
| | 5 | .60** | .21 | .54** |
| Macro Variables | 6 | .15 | .65** | .31 |
| | 7 | .23 | .56** | .34 |
| | 8 | .53* | .58** | .56** |
| | 9 | .56** | .58** | .67** |
| | 10 | .46* | .79** | .58** |
| | 11 | .28 | .31 | .36 |

* = $p < .05$

** = $p < .01$

TABLE 11

Spearman Correlations for Micro, Macro and Total
Site Rating Scores Against Gallonage

| Site Rating Scores | Majors (N=23) | Independents (N=20) | All Stations (N=43) |
|--------------------|---------------|---------------------|---------------------|
| Micro | .70** | .51* | .14 |
| Macro | .07 | .65** | .21 |
| Total | .83** | .66** | .25 |

* $p = < .05$

** $p = < .01$

sample are located in very similar socio-economic areas of the city.

When the stations were rated, it was noted that there was very little difference in income, social status, and development of the areas surrounding the major company stations. This homogeneity has obviously been reflected in the macro subscores.

It can be seen that, for this sample, the only significant difference among stations is in the micro ratings. In other words, stations receiving high micro ratings because of factors such as superior facilities and accessibility, have generally higher gallonage figures.

This would seem to substantiate the basic findings of the California study. It also shows that the micro variables do function as surrogate measures of gallonage performance.

Since gallonage is the only criterion measure used in the present study, it seems fruitless to discuss the macro variables as indicators of

site quality. This is because the macro variables were originally designed as surrogate measures of the station's economic life.

The conclusion reached in Stage 1 is thus: in terms of gallonage performance, the micro variables of the site rating instrument are a valid measure of site quality for major company stations.

Stage 2: independent stations. Table 11 reveals that the total and macro scores were more significantly correlated with gallonage than the micro scores. It appears in this case that the macro variables are a better measure of gallonage than are the micro variables. The failure of the micro variables to adequately function as surrogate measures of site quality for independent stations was anticipated in the research hypothesis. Although it would appear that independent stations are of generally lower quality and lack the facilities and accessibility enjoyed by major stations, it does not necessarily mean that they sell less gasoline. In actual fact, independent dealers, on the average, pump more than twice as much gasoline as do the median gallonage stations for the major companies. (See Table 4 , Chapter 4.)

The results also indicate the price-cutter's strong dependence on the surrounding area. Because the independent's strategy is one of market segmentation, the most successful stations are those located in areas containing the highest proportion of people likely to frequent that type of station. In general, the independent stations were found in lower income areas, on the edge of the C.B.D., or in association with department stores or shopping centers. The variance among the price-cutters is

reflected by differences in the socio-economic environment of the individual stations as measured by the macro subscores, whereas the variance in gallonage of the major companies is due largely to the facilities they offer as measured by the micro subscore.

The conclusion reached in Stage 2 is: in terms of gallonage performance, the micro variables of the site rating instrument are not good measures of site quality for independent stations.

Although it would appear that the independent stations are of a generally lower quality in terms of facilities and convenience than the major stations, it is still conceivable that the micro variables could be valid measures of site quality. This point is illustrated in Figure 11, where both the major and independent stations have equal beta (β) coefficients for hypothetical least squares equations. In this case the least squares lines would be parallel, and for points of equal gallonage, the independent stations would have lower site rating scores.

In actual fact, however, this situation does not exist. Figure 12 gives a scatter plot of both major and independent stations with their respective least squares lines. As can be seen, these lines are not parallel.

It must be concluded then, that for independent stations, some surrogate measure other than the micro subtotal should be used to measure site quality. It would appear that the gallonage performance of independent stations is based on criteria other than facilities and convenience. The

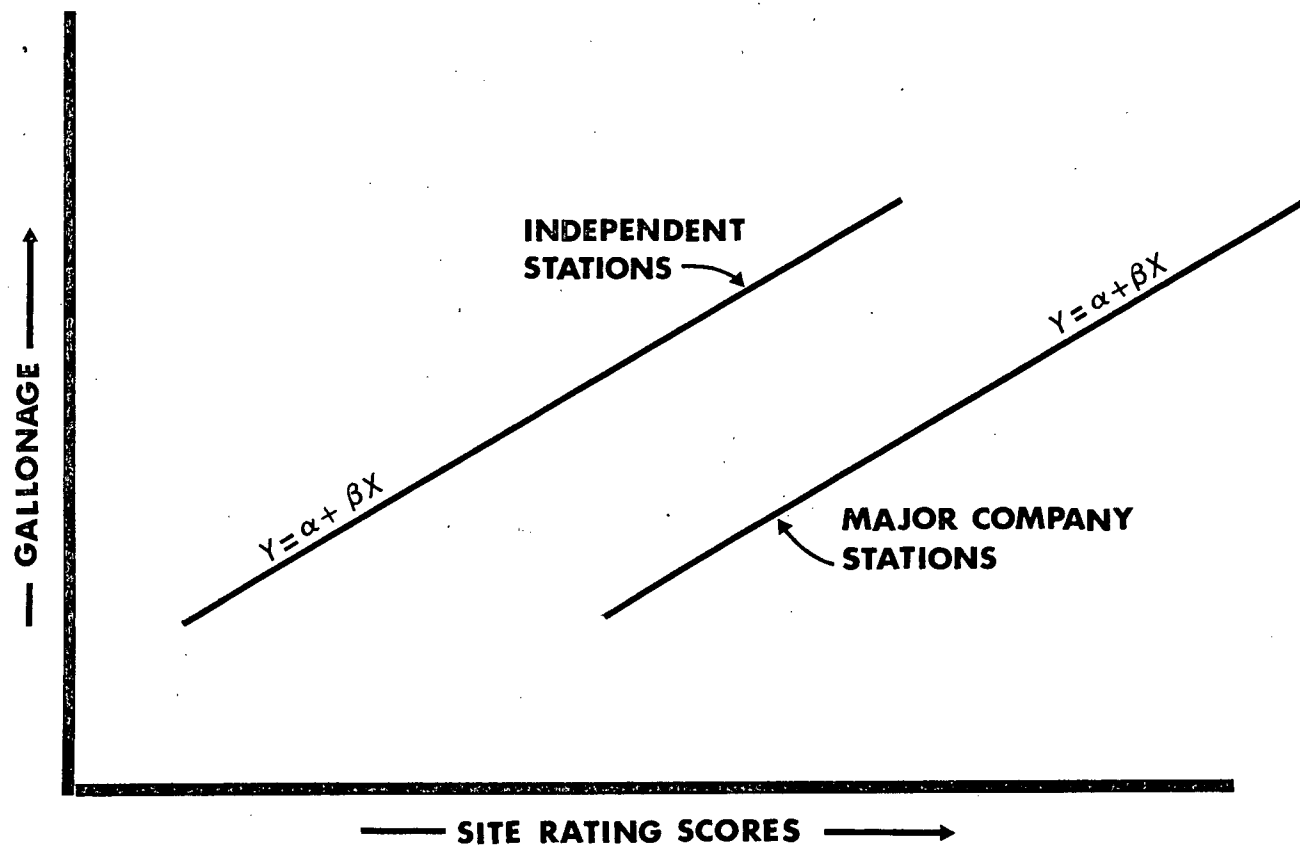


FIGURE 11.
HYPOTHETICAL LEAST SQUARES LINES

Scatter Plot of Major and Independent Stations with their Respective Least Squares Lines Based on Micro Scores

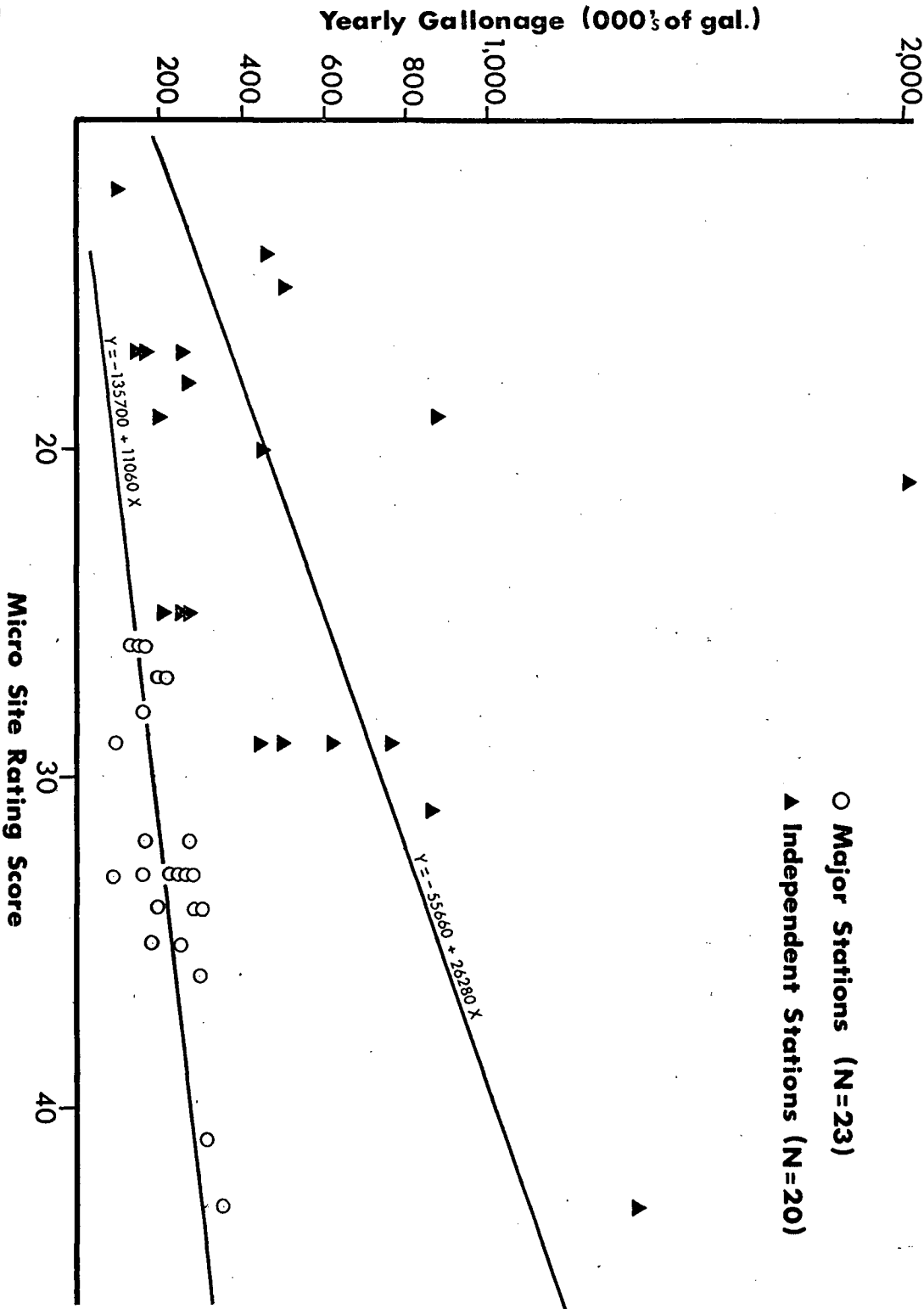


FIGURE 12.

higher correlation values for the macro and total scores would seem to suggest that a site rating instrument based on variables that measure the surrounding area would be a likely starting point.

It should be clear at this point that independent stations are of different quality than the major company stations.

Stage 3: all stations. The results of the third stage of the analysis model strongly indicate that the site rating instrument will not work universally when all stations are included. This reinforces the finding of the second stage that in order to predict the performance of gasoline service stations which employ a price-cutting strategy, a different measurement of site quality must be used. Even though major and independent stations perform the same function, i.e. retailing gasoline, their locational and site quality requirements in the urban environment are quite dissimilar. This difference, it is suggested, should be recognized by academics and planners, both of whom to date have largely ignored such differences in their consideration of retail sites.

Least Square Analysis

In order to see how well the independent variables (i.e. micro, macro, and total scores) predicted gallonage a least squares analysis was performed on the data.

The basic method of least squares reduces to a problem of fitting a straight line to a set of points. This is achieved by choosing any two estimates of α and β in the line, $Y = \alpha + \beta X$, as to minimize the

sum of the squares of the errors:

$$\sum (Y - \hat{\alpha} - \hat{\beta} X)^2$$

where $\hat{\alpha}$ and $\hat{\beta}$ are estimators of α and β respectively.

"About 150 years ago the scientist Gauss showed that estimates obtained in this way are (i) unbiased, and (ii) have the smallest standard errors of any unbiased estimators that are linear expansions in the Y's" (Snedicor & Cochran, 1967, p. 147). Important to note, is the fact that Gauss' proof does not require the data to be normally distributed. Lindley (1947) emphasizes this point by saying that "The method of least squares requires no assumptions about the probability distributions as it applies to any group of ordered pairs of observations" (p. 241).

Although the data in the present study cannot meet the assumption of normality, it is still permissible to apply a least squares analysis. The effectiveness of the least squares line is measured by the standard error of estimate for Y as defined in the formula:

$$S_e = \sqrt{\frac{\sum_{i=1}^n (Y_i - Y'_i)^2}{n - 2}}$$

where Y = the actual value of the dependent variable

Y' = the predicted value of the dependent variable

n = number of observations (Hoel, 1966, p. 218)

Table 12 reports the results of the least squares analysis in terms of gallons per month for major, independent, and all stations. Figure 13 shows the scatter plot and least squares lines for both the major and

○ Major Stations (N=23)

▲ Independent Stations (N=20)

Yearly Gallonage (000's of gal.)

Total Site Rating Score

$Y = -1082.000 + 33.9700 X$

$Y = -579.000 + 13.620 X$

FIGURE 13.

TABLE 12

Standard Error of Estimate from Least Squares Analysis

| Type of Station | Standard Error of Estimate (S_e) |
|---|--------------------------------------|
| a) <u>Major Companies</u> (N = 23) | |
| Micro | 3,700 |
| Macro | 5,800 |
| Total | 1,900 |
| b) <u>Independent Stations</u> (N = 20) | |
| Micro | 37,300 |
| Macro | 27,300 |
| Total | 32,500 |
| c) <u>All Stations</u> (N = 43) | |
| Micro | 31,000 |
| Macro | 25,200 |
| Total | 30,700 |

independent stations. According to the Spearman correlations the total site rating score for both groups of marketers should be the best predictor of gallonage.

By using total site rating score as the independent variable, the least squares model could predict the gallonage of the majority of major company stations to within 1,900 gallons per month. In terms of average monthly gallonage per station this represents an error of less than 10 per cent. Discussion with oil company officials revealed that this error in prediction is well within the limits used by oil companies themselves in predicting the gallonage of a service station site. It appears once again that the site rating instrument is indeed a valid measure of site quality.

Although the results for the independent stations reveal the fact that the macro variables are the best predictors of gallonage, calculation of the error in terms of average monthly gallonage revealed an error of 73 per cent. This would seem to indicate that the variables in the least squares model are not good predictors of gallonage for independent stations.

Calculation of percentage error for all stations (again using the macro variables) produced an error of 80 per cent. This result was not unexpected and confirms the finding of the three stage correlation analysis that the instrument cannot function universally for stations employing different marketing strategies.

Parametric Correlation Analysis

A parametric correlation analysis very similar to the preceding nonparametric analysis was also performed on the data. The author is well aware of the limiting assumptions regarding such statistical tests, and presents the results of the parametric analysis only as an interesting comparison. No conclusions or inferences are being drawn from the following analysis.

The correlation statistic used in the following tests was the familiar Pearson r . Tables 13, 14, and 15 present the correlation coefficients of the eleven site rating variables with the three site rating scores for the major companies, for the price-cutter, and for all stations. Table 16 conveys the results of the Pearson correlations between site rating scores and gallonage.

TABLE 13

Pearson Correlations of the Eleven Site Rating
Variables with the Three Site Rating Scores For
Major Companies (N = 23)

| Variable No. | | Site Rating Scale | | |
|-----------------|----|-------------------|-------|-------|
| | | Total | Micro | Macro |
| Micro Variables | 1 | .60** | .76** | -.40 |
| | 2 | .57** | .67** | -.31 |
| | 3 | .75** | .74** | -.09 |
| | 4 | .31 | .44* | -.05 |
| | 5 | .04 | .18 | -.24 |
| Macro Variables | 6 | .31 | -.14 | .76** |
| | 7 | .25 | -.17 | .76** |
| | 8 | -.10 | -.44* | .60** |
| | 9 | .34 | .35 | .02 |
| | 10 | -.13 | -.002 | .13 |
| | 11 | .07 | -.29 | .63** |

* = p < .05

** = p < .01

TABLE 14

Pearson Correlations of the Eleven Site Rating
Variables with the Three Site Rating Scores For
Price-Cutters (N = 20)

| Variable No. | | Site Rating Scale | | |
|-----------------|----|-------------------|-------|-------|
| | | Total | Micro | Macro |
| Micro Variables | 1 | .77** | .81** | .16 |
| | 2 | .89** | .92** | .14 |
| | 3 | .81** | .83** | .20 |
| | 4 | .56** | .66** | -.08 |
| | 5 | .52* | .53* | .13 |
| Macro Variables | 6 | .28 | .05 | .80** |
| | 7 | .20 | .02 | .80** |
| | 8 | .25 | .18 | .27 |
| | 9 | .56** | .23 | .79** |
| | 10 | .49* | .24 | .74** |
| | 11 | .15 | .11 | .35 |

* = $p < .05$

** = $p < .01$

TABLE 15

Pearson Correlations of the Eleven Site Rating
Variables with the Three Site Rating Scores For
All Stations (N = 43)

| Variable No. | | Site Rating Scale | | |
|-----------------|----|-------------------|-------|-------|
| | | Total | Micro | Macro |
| Micro Variables | 1 | .80** | .85** | .07 |
| | 2 | .83** | .87** | .11 |
| | 3 | .84** | .85** | .18 |
| | 4 | .71** | .76** | .11 |
| | 5 | .34* | .38** | -.02 |
| Macro Variables | 6 | .43** | .11 | .78** |
| | 7 | .33* | .13 | .70** |
| | 8 | .13 | .01 | .44** |
| | 9 | .53** | .17 | .53** |
| | 10 | .45** | .01 | .52** |
| | 11 | .31* | .05 | .47** |

* = $p < .05$

** = $p < .01$

TABLE 16

Pearson Correlations Between Site Rating Scores and
Gallonage

| Site Rating Scores | Majors (N = 23) | Independents (N = 20) | All Stations (N = 43) |
|-----------------------|--------------------|--------------------------|--------------------------|
| Micro | .74** | .40 | -.01 |
| Macro | -.02 | .76** | .45** |
| Total | .82** | .64** | .15 |

* = $p < .05$

** = $p < .01$

As can be easily seen, the results of the parametric correlations are extremely similar to the nonparametric correlations.

A Small Case Study

In the course of rating the stations selected for the present study, the author became aware of an interesting situation. Although the major company stations were chosen at random from a prepared list, it occurred that three stations in the study were less than two blocks from each other. Figure 14 illustrates their relative street locations.

Station A and C were major company stations belonging to competitive firms, while Station B operated as a price-cutter selling gasoline at 4¢ less per gallon than the other two. All stations were on major city arteries with Station C having the highest traffic count.

Table 17 presents the pertinent data on all three stations. It can be seen that the major company stations (A and C) pump very similar

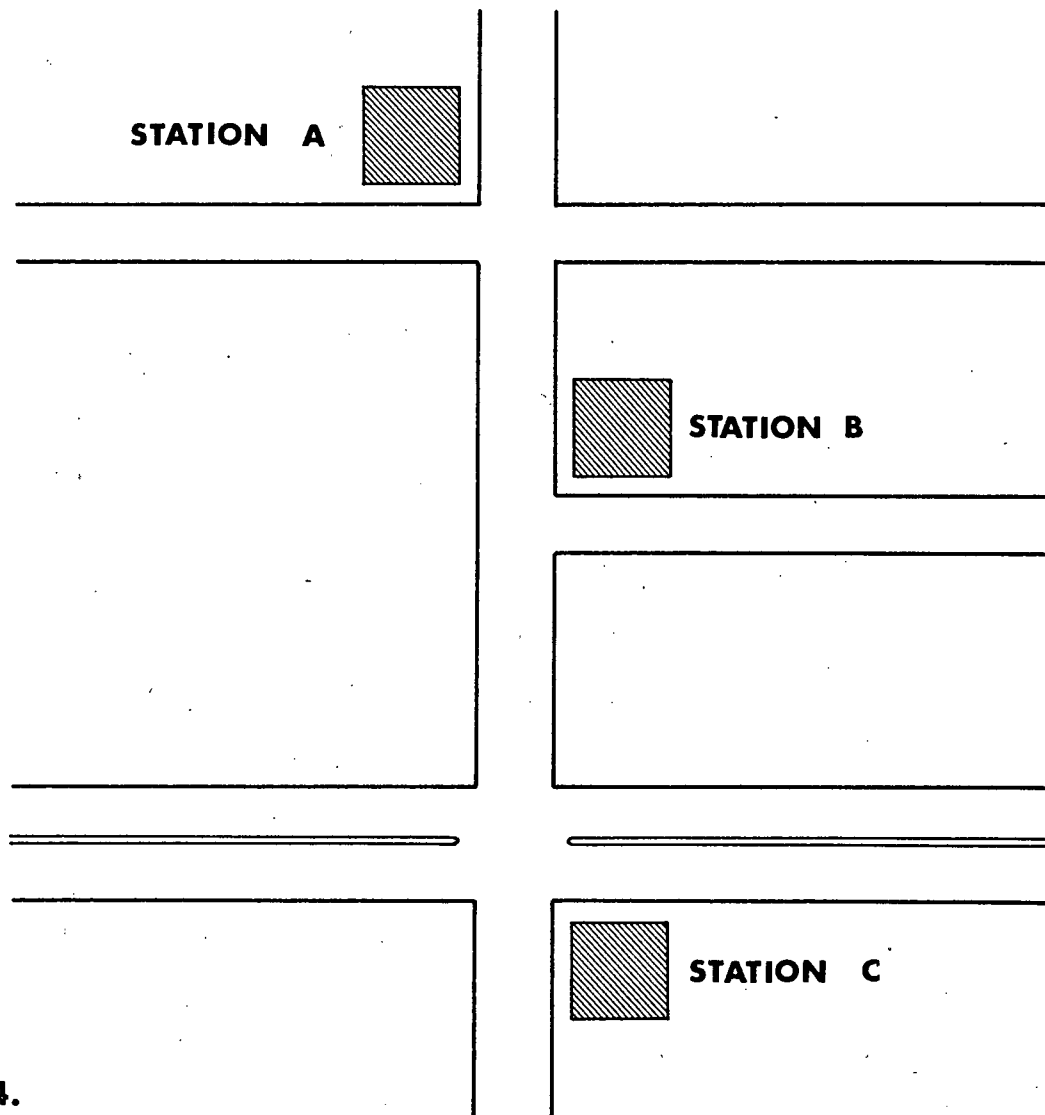


FIGURE 14.

Relative Street Location of Three Stations in Small Case Study

TABLE 17

Gallonge and Site Rating Data for Three Stations in the Case Study

| Station | Yearly Gallonge | Total Site Rating Score | Predicted Gallonge From Least Squares Analysis | Ratio of Gallons Per Unit Score | Difference |
|---------|-----------------|-------------------------|--|---------------------------------|--------------------------|
| A | 233,835 | 60 | 237,890 | 3,897 | 436 (A-C) 4,757 (C-B) |
| C | 273,000 | 63 | 265,140 | 4,333 | |
| B | 500,000 | 55 | 786,360 | 9,090 | |

volumes while the price-cutter pumps twice as much gasoline as the other two. The site rating scores for stations A and C are also very similar. The price-cutter's score, however, is a full five points lower. When ratios of gallonage per unit score (i.e. total gallonage divided by total score) are calculated the major stations are again very close, their difference being only 436 gallons/unit score. In terms of monthly gallonage this represents a figure of 36 gallonages/unit score. It would appear, again, that for major company stations, the site rating instrument is very uniform and accurate. The predicted gallonages for the individual stations, in this instance, are surprisingly close to the actual figures given by the respective companies.

The price-cutter, on the other hand, shows a gallon/unit score of 9090, more than twice that of the major stations.

It seems clear in this limited case, that given equal facilities and locational advantage, the price-cutter can pump more than twice as much gasoline as the major company stations. This is accomplished by adopting a strategy of cutting price by 4¢ per gallon.

Although this case study is a limited instance it does serve to demonstrate the dramatic effects on the landscape that a change in marketing strategy can create. It also demonstrates that a shift in strategy changes the qualitative nature of the individual site.

CHAPTER 5

CONCLUSIONS AND IMPLICATIONS

The site rating instrument was demonstrated to be a valid measure of site quality for major company stations. Verification was performed by the Spearman analysis, the least squares analysis of the sample of stations, and the small case study. For the majority of major stations in the study, gallonage could be predicted within a standard error of 1,900 gallons per month. The results of this part of the research confirm the findings of Claus' experiment with service stations in California.

In contrast, the site rating instrument as a measure of quality for the independent stations showed a serious weakness in its ability to predict gallonage. The site rating score that produced the highest correlation with gallonage was the macro subtotal, i.e. those variables concerned with the socio-economic environment surrounding the station. Differences in the micro variables (design and layout) had very low correlations with gallonage. It was also shown that the macro scores for both the major and independent stations were drawn from the same statistical population. As anticipated, the price-cutters had generally

lower quality stations (in terms of the rating instrument) but they invariably pumped more gasoline (on equivalent ratings) than the major stations. The most evident factor to explain this gallonage discrepancy is the different marketing strategies: price-cutting versus time and convenience. It must be concluded that the quality requirements for a major station and an independent station are not comparable on the same basis.

This lack of direct comparison was also demonstrated in the series of Mann-Whitney U tests which showed the gallonages, micro scores, and total scores to be from two different statistical populations. Direct comparisons also failed in Stage 3 of the Spearman correlation analysis and in the least squares analysis.

From the results it can be concluded that the requirements for building and locating a high quality site for a price-cutter are much different than the requirements demanded by a major company in building and locating a high quality site. If this is true, then we must accept the original research hypothesis that different marketing strategies can cause differences in site quality.

It follows from the hypothesis that in order to make the best use of any particular location, a company should choose the appropriate marketing strategy and build the site accordingly. Companies not only influence the landscape in this way, but in turn, the landscape creates changes in company policy. As was illustrated in Chapter 3, companies are acutely aware of environmental changes and are usually quick to react. In the case of service stations, for example, a change in the road

network or population strategy may necessitate a shift in strategy. A declining neighborhood station may sometimes make an ideal price-cutter.

This study has implications for city planners. In order to make the most efficient use of urban space differences in site quality should be taken into account. Making either the price-cutter or the major company adhere to a single set of criteria will create an inefficient and inequitable system; inefficient in the sense that the consumer will pay more for his gasoline; and inequitable in that it gives one competitor undue advantage over another. Any diseconomies created by an inadequate system will likely be passed onto the consumer in the form of increased prices.

Vancouver has such restrictive zoning on service stations. In 1968, drawing upon Judge Morrow's findings that there were too many service stations in British Columbia, Vancouver City Council embarked on a conscious policy of limiting the number of service stations being built in Vancouver. A two-part study into the location and quality of service stations was launched by Council in October of 1968 (City of Vancouver Planning Department, 1968, 1969). The essential recommendations of the Planning Board that performed the studies were activated under By-law No. 4423 in April 1969¹ vesting the final decision on the building of any service station in Vancouver with City Council. In other words,

¹Based on the American Society of Planning Officials (A.S.P.O.) Information Report No. 140 the By-law allows service stations to locate "conditionally" in C-1, C-2, and C-3 zones.

all applications for new service station sites are presented before Council at an open hearing.

The original intention of Council was to limit the total number of service stations. However, Council's efforts have had just the opposite effect.

Although the gasoline service station industry in North America had seen a marked decline in the relative number of service stations as well as an absolute decline in some areas, after City Council initiated its plan in 1968, the number of outlets in Vancouver has since remained almost constant. Since 1957, for example, Imperial Oil reduced its number of stations in British Columbia by 85 (or 13 per cent), while the motor vehicle population increased by 74 per cent (Imperial Oil, 1967, p. 9). In the years between 1962 and 1967 the City of Vancouver experienced a decline in the number of service stations from 376 to 340 (or 9.57 per cent). Since 1967, when the Morrow Commission Report appeared and City Council launched its campaign against service stations, the absolute number of outlets has remained relatively constant, i.e. 342 in 1970.

Although the slow down in the decline of stations could be attributable to the entry of several new competitors, plus the rising employment in central Vancouver, discussion with oil company representatives indicates that Council is responsible for preventing the natural trend of events. Several oil companies themselves have indicated that they wish

to reduce their total number of stations, but are prevented in doing so more rapidly by the present situation.

Elsewhere in North America, companies are selling off station property, while consolidating their market into fewer but bigger stations. The basic process is one of eliminating two or three small stations in poorer locations and building one large station that is well located. In this way they may still maintain their market share while reducing the total number of stations. The process also makes additional land available for other forms of land use.

In Vancouver, however, the oil companies are not allowed to build stations where they would like. Often it is difficult to get a station built in a location that is already properly zoned. Because the companies cannot risk giving up two or three stations before a new one (or an improved one) is built, they tend to hold on to their present sites. Many companies would like to turn old, outdated, and unprofitable stations to other forms of land use but are prevented in doing so by the fear of losing a portion of their market share. If a company eliminates a station without replacing it, all its other stations must sell more gasoline to make up for this loss.

Generally, all companies must achieve a required rate of return on their investment. In a market where continued response to a changing environment cannot be maintained the company has two choices: 1) raise the price of the product, and 2) lower the capital investment. Either choice is unbeneficial to the public.

An excellent example of service station consolidation occurred in Richmond, British Columbia, where Gulf agreed to close down three of its facilities if it could build one to replace it. Gulf was so successful in its choice of location and facilities that the single location is now pumping more gasoline than the other three did combined.² The Municipality of Richmond also benefited by receiving more commercial space plus a very successful business enterprise.

Although price cutters will always be in the market place, it is uncommon for them to control more than 10 per cent of the market. In Vancouver, however, price-cutters account for 15.61 per cent of the volume sales, but only 5.88 per cent of the number of stations. The reason for this uncommon discrepancy appears to stem in part from the fact that major companies are hindered in their normal form of competition by the local zoning restrictions as well as the previously mentioned refinery complications (Chapter 4).

It appears that a slow down of the general market trend has contributed in some extent to the growth of price-cutters in the Vancouver market. If sufficient service and convenience cannot be offered by the major companies, people will "tend" to buy gasoline from the cheapest seller. Because the price-cutter does not need good facilities, he can afford to purchase a more inaccessible and less visible site and still make

²Interview with Mr. Ray Pochmara, Gulf Oil representative, (1970).

a profit. With more people buying from price-cutters, the major stations, which are not really convenient or which cannot offer full service, will go out of business or will be poor businesses. The city again suffers because of poor business enterprises, vacant lots, and shoddy buildings. Since the major companies supply the bulk of gasoline to the independents, the cost of such diseconomies are again passed onto the consumer, and the city is stuck with relatively unsightly and ill equipped price-cutter stations. Because price-cutters usually locate on less desirable sites, the taxes are generally lower on these lots, so the city again loses.

Although zoning and by-laws are intended to further the "public good," they can in some instances obstruct the "public good." The reason for this is usually attributed to environmental changes or lack of information. In this part of the twentieth century with an increasing paucity of land and changing technology, the best course of action is to raise the entire informational level of the market place and municipal decision-makers to a point that allows some degree of enlightened compromise. This thesis has been designed to convey some small bit of new knowledge concerning urban retail site; namely that the requirements for an efficient and viable retail site are to some extent dependent on the type of marketing strategy that is used in selling the product. As marketing strategies vary so will the quality of site vary. This aspect is important to both corporations and cities who want to maximize urban space.

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APPENDIX A

Original Data Tables

APPENDIX A

Original Data Tables

| | Micro Score | Macro Score | Total Score | Gallonge |
|------------------------------|----------------|----------------|----------------|-----------|
| A. Major Company Stations | 43 | 24 | 67 | 350,000 |
| | 36 | 29 | 65 | 300,000 |
| | 34 | 28 | 62 | 300,000 |
| | 33 | 24 | 57 | 280,000 |
| | 35 | 26 | 61 | 260,000 |
| | 27 | 30 | 57 | 220,000 |
| | 41 | 25 | 66 | 324,000 |
| | 32 | 27 | 59 | 272,000 |
| | 33 | 24 | 57 | 236,000 |
| | 35 | 26 | 51 | 179,000 |
| | 33 | 24 | 57 | 162,000 |
| | 28 | 28 | 56 | 157,000 |
| | 34 | 28 | 62 | 279,000 |
| | 33 | 29 | 62 | 254,900 |
| | 33 | 24 | 57 | 246,400 |
| | 34 | 26 | 60 | 203,800 |
| | 27 | 31 | 58 | 192,000 |
| | 33 | 26 | 59 | 165,800 |
| | 26 | 29 | 55 | 160,500 |
| | 33 | 24 | 57 | 149,600 |
| | 27 | 27 | 54 | 149,200 |
| | 27 | 26 | 53 | 146,400 |
| | 29 | 24 | 53 | 143,300 |
| B. Independent Stations | 29 | 27 | 56 | 450,000 |
| | 18 | 24 | 42 | 270,000 |
| | 25 | 24 | 49 | 260,000 |
| | 25 | 24 | 49 | 250,000 |
| | 17 | 21 | 38 | 250,000 |
| | 17 | 21 | 38 | 150,000 |
| | 12 | 21 | 32 | 100,000 |
| | 15 | 24 | 39 | 510,000 |
| | 29 | 26 | 55 | 500,000 |
| | 20 | 27 | 47 | 450,000 |
| | 19 | 25 | 44 | 200,000 |
| | 43 | 24 | 67 | 1,350,000 |
| | 25 | 22 | 47 | 220,000 |
| | 21 | 36 | 57 | 2,100,000 |
| | 29 | 26 | 55 | 760,000 |
| | 14 | 25 | 39 | 540,000 |
| | 17 | 24 | 41 | 160,000 |
| | 31 | 32 | 63 | 860,000 |
| | 29 | 24 | 53 | 620,000 |
| | 19 | 25 | 44 | 870,000 |