THE WINE INDUSTRY AND THE CONSUMER

A study of the production, distribution
and consumption of wine in New Zealand

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ABSTRACT

This thesis is an investigation into production, distribution, and consumption of wine in New Zealand, with particular consideration of the effects of the wine industry's structure and behaviour on consumer interest.

Government protection policies have greatly influenced expansion and structural development of the industry. Protection of the existing local industry was mainly effected by reducing opportunities for competition in two ways: implementation of import control regulations which have restricted competition from overseas wines, and introduction of licensing laws which have favoured control of the wine trade by a limited number of licence holders.

Investigation into industry ownership patterns showed the presence of vertical and horizontal integration at various stages of the marketing system. Mergers and takeovers have resulted in the formation of a powerful group of companies which control wine marketing. These companies are usually associated with breweries, large distribution companies, and companies with overseas connections. In addition, concentration ratios calculated at the production level provided evidence that the wine industry is highly concentrated. In 1981 six firms controlled about 87% of the market.

The degree of concentration and the ownership patterns of the New Zealand wine industry are indicators of its oligopolistic structure and market power. This market power is not altered by the presence of overseas wines in New Zealand as the volume of imports is very small (5% of total sales in 1978-1979). Limited competition and oligopolistic industry structure have contributed to the industry's behaviour in determining quality of products, prices and output. Lenient regulations governing wine-making have also affected wine quality. Adulteration of some New Zealand wines, evident from statistical data, was subsequently substantiated by the Consumer Institute analysis of local wines. Statistical data on industry production indicated that when the industry faced over-supply, output was reduced and prices were maintained.

Legislation for the protection of consumer interest in New Zealand has been mainly directed at prevention of malpractice that may result from monopolies, mergers and takeovers, and at control of certain trade practices judged to be against the public interest (Commerce Act 1975). Legislation has also aimed to improve the availability of information to consumers and to regulate quality standards (Food and Drug Regulations 1973, Amendment No. 5, 1980/73).

A consumer study was carried out in Palmerston North to relate the effects of industry structure and government intervention to actual consumer requirements and consumer perceptions of the products available in the New Zealand market. A survey, which involved a randomly selected sample of 237 respondents, helped to identify three main groups: 32% of the adult population surveyed were regular consumers of wine, 38% used wine occasionally, and the remaining 30% did not drink. Survey results indicated a reduction in the growth of wine consumption. Consumer preferences and consumer satisfaction with quality and prices of New Zealand wines, were also evaluated from survey results.

Findings from the consumer survey showed that a group of wine users with similar socio-economic status (mainly professional people) was responsible for more than half of the total wine consumption. To provide an in-depth analysis of the perceptions and preferences of this particular group of regular consumers, a pilot study based on the application of multidimensional scaling was carried out. Results of this study indicated that consumers considered some New Zealand wines to be close substitutes for some overseas wines (e.g., a New Zealand Riesling for the German wine "Blue Nun"). New Zealand sparkling wines, however, were not considered to be good substitutes for overseas sparkling wines. No wines in the sample were closely identified with any of the consumer preferences (expressed as ideal points in a multidimensional scaling representation). This indicated that the wines included in the sample did not totally fulfil the requirements of the selected group of regular consumers, either in terms of quality or price.

Research findings from both industry and consumer studies suggested that consumers had been deprived of the benefits of competition. Furthermore, if consumer interest is to be protected, a more competitive system has to

be developed through liberalisation of import policies and licensing laws.

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INTRODUCTION

"Economics" has been defined as the discipline that studies the utilisation of scarce resources to satisfy human needs (Henderson and Quandt 1958, Samuelson 1973). According to this definition, the study of an economic activity involves a two-way approach: analysis of the way in which the economic activity is organised to produce certain results, and evaluation of these results in light of their contribution to satisfying human wants.

The economic activity studied in this thesis is the production, distribution and consumption of wine in New Zealand. The thesis examines the historical origins of wine-making in New Zealand and government policies which have influenced developments in the industry's structure. It investigates organisational and behavioural aspects of production and distribution, with a view to evaluating their effects on consumer interest.

To provide a base for comparison, Chapter 1 introduces a theoretical approach to perfect competition, oligopolistic competition and monopoly.

The historical background of wine-making and wine consumption, together with a study of government intervention in the past, gives an understanding of structural developments that have taken place in the industry. These are outlined in Chapter 2.

Analyses of observed trends of supply and demand offer a base for interpretation of the industry's behaviour. These trends are investigated in Chapter 3.

Through vertical or horizontal integration in the production and marketing system, firms can increase their market power relative to the rest of the system which is not integrated. Evidence is presented in Chapter 4 to show the interrelationships among the various levels of the marketing system from grower to consumer.

The degree of concentration is an indicator of the way in which a small number of firms are in a position to exercise a predominant influence on the market. In Chapter 5, industry concentration at the production level

is investigated.

Chapter 6 examines the behaviour of the wine industry with respect to pricing and output strategies. Conduct patterns of the distribution system, product differentiation and services to the consumer are also investigated.

The environment in which a marketing system operates influences its behaviour and structural development. In New Zealand, government protection policies for the wine industry have been an important determinant of industry structure. The licensing system, import regulations, and other government measures to protect the wine-making industry are studied in Chapter 7.

Chapter 8 introduces a theoretical approach to consumer interest and consumer protection. Trade practices in New Zealand regulated by the Commerce Act 1975 and particularly trade practices within the wine industry are also examined.

To relate the effects of industry structure and government intervention to actual consumer requirements, perceptions and preferences about quality and prices of wines available in New Zealand, a consumer survey, which involved a randomly selected sample of 237 respondents, was carried out in Palmerston North. Survey results are summarised in Chapter 9.

Findings from the consumer survey showed that a group of wine users belonging to the same socio-economic group, was responsible for more than half of the total wine consumption. To provide an in-depth analysis of the perceptions and preferences of this consumer group, a pilot study was carried out by applying a multidimensional scaling technique. Chapters 10 to 16 present the methods and research procedures of the technique employed, and summarise results obtained.

Results of the consumer analysis and the main findings of the industry's study lead to a final discussion in Chapter 17 on industry interests versus consumer interests and industry protection against consumer protection.

CHAPTER 1

THEORETICAL BACKGROUND

1.0 - Introduction

This chapter describes the economic systems of perfect competition, monopoly and oligopoly, to provide a framework of analysis for the system under which the wine industry operates. At a later stage, the links between industry structure and consumer interest will be investigated.

A summary of research methods applied to the industry study is also included in this chapter.

1.1 - Theoretical approach to perfect competition

It is well established in the literature that consumers maximise satisfaction under a system of perfect competition, provided that a strict set of assumptions is met. A departure from the principles of perfect competition indicates a departure from the maximisation of consumer welfare.

The theory of perfect competition is based on assumptions which, although they depart from reality, are useful as a starting point for the description and analysis of economic activity. The fundamental assumptions made by the theory of perfect competition, as stated by Stigler (1966), are: the presence of many buyers and sellers such that no individual or group has any influence on the market; no restriction upon movement of factors of production; homogeneous products; and perfect knowledge of all conditions operating on the market. In a perfect market, firms face a horizontal demand curve. Price is a parameter for individual producers and consumers, but is a variable determined by the combined actions of buyers and sellers in the market.

Each producer in an industry will tend to increase production until the marginal production cost equals the marginal revenue of the product. Marginal cost is defined as the additional cost of production required to produce an extra unit. Marginal revenue is defined as the additional total revenue which results from the sale of an extra unit of output. If

a firm's average costs can be lowered by an increase in output, then the marginal cost is below the average cost. The opposite is the case when an increase in output causes the average cost to rise. Thus, at the point where a firm's average cost is at its minimum, average cost equals marginal cost (Stigler 1966).

In perfect competition it is assumed that the market price is unaffected by variations in the output of individual firms, therefore their marginal revenue is constant and equals price. The freedom of producers to move in and out of an industry keeps the price of each product equal to the minimum average cost of production. If the price of any commodity were higher than the average production cost, either new firms would be attracted to enter the industry or existing firms would expand and the total output would increase. This shift in supply would cause a fall in price to the lowest point of the average cost of production (Robinson 1965).

It is possible to draw other important conclusions from this concept of perfect competition. Consumers will maximise the satisfaction obtained from the distribution of their income when the marginal utility of money spent on each commodity purchased is the same. The marginal utility of money spent on a commodity is the amount by which consumers' satisfaction increases if one more unit of money is spent on that commodity (Stigler 1966).

Meade (1937) pointed out that in perfect competition the factors of production would be used in different occupations in such a way that consumers' needs were best satisfied; the factors of production would automatically be used in such proportions in different industries that it would be impossible to increase output from one industry without reducing output from some other, and all the individual firms would be of the most efficient size.

If the conditions of perfect competition could prevail, the individual consumer would get the best possible deal from the economic system.

1.2 - Welfare economics

A great deal has been written about the notion that perfect competition represents an optimal situation which leads to maximum satisfaction for all individuals in society. Some economists have qualified that judgement. Samuelson (1948:210) stated that "the founders of neo-classical economics believed that perfect competition led to an optimum in 'exchange and production' provided that the distribution of income was appropriate". Pareto, however, took the view that competition produces maximum collective satisfaction regardless of the distribution of income. The Pareto principle states that a change is desirable if it makes some individuals better off without making any others worse off (Ng 1979).

The relationship between perfect competition and Paretian optima has been considered the core of welfare economics. As Ng (1979:47) pointed out: "it is well established that, under certain classical assumptions such as non-increasing returns, the absence of externalities, etc., a perfectly competitive economy will attain a Pareto optimum".

When conditions of equilibrium cannot be satisfied, an optimum situation can only be achieved by departing from Paretian conditions. This led to the formulation of the theorem of the "second best" which stated (Lipsey and Lancaster 1956-58:11) that "if there is introduced into a general equilibrium system a constraint which prevents the attainment of one of the Paretian conditions, the other Paretian conditions, although still attainable, are, in general, no longer desirable". In other words, given that one of the Paretian conditions cannot be achieved, an optimum can be achieved only by departing from all the other Paretian conditions. Davis and Whinston (1965) developed a method of analysis which allows the determination of whether a specified violation of one or more of the Pareto conditions would make it socially desirable that certain other conditions be violated as well. If an economic activity produces an external economy/diseconomy on others, the activity tends to affect the social optimum.

In the real world a number of the optimum conditions are not realized. Samuelson (1948:252) stated that "almost all industries are producing at marginal social costs less than price (either because of monopoly or external economies)". Nath (1969) concluded that the main factors which

may account for failure of a market economy to reach a perfectly competitive equilibrium are: externalities, irrational choice, imperfect knowledge, uncertainties and inappropriate distribution of income.

1.3 - Theoretical approach to imperfect competition

1.3.1 - Monopoly

Imperfect competition is present in a market system when one or several of its units can exercise an influence on the market price; by increasing output the price can be forced down and by reducing it the price can be forced up. In the case of a monopolist, the demand curve of the firm, which is the average revenue curve, coincides with the market demand curve. In the case of perfect competition the unit of production faces a perfectly elastic demand whereas the monopolist faces a downward sloping demand curve. The marginal revenue curve of a monopolist is marginal to the market demand curve (Robinson 1965).

The profit maximisation equilibrium position has to meet several conditions. These are that the marginal cost equals the marginal revenue, the marginal cost curve cuts the marginal revenue curve from below, and at that point the price is higher than the average cost (Figure 1.1).

As the marginal revenue curve lies below the average revenue curve and the marginal cost curve lies above the average cost curve, the marginal curves intersect at a point corresponding to a price level higher than that of a competitive industry (Figure 1.1). To maximise profits the monopolist equates marginal cost to marginal revenue, but the marginal revenue does not necessarily equal price. In Figure 1.1 the equilibrium output of a monopolist would be the output OM. At a price OF profits are represented by the shaded rectangle.

A monopolist's control over the price of a product may be limited when the demand for it is highly elastic and/or when the monopolist's control over supply is only partial. Chamberlin (1962) noted that another important factor affecting the monopolist's control over price is the presence of substitutes. The more substitutes controlled by one seller the greater is the seller's control over price.

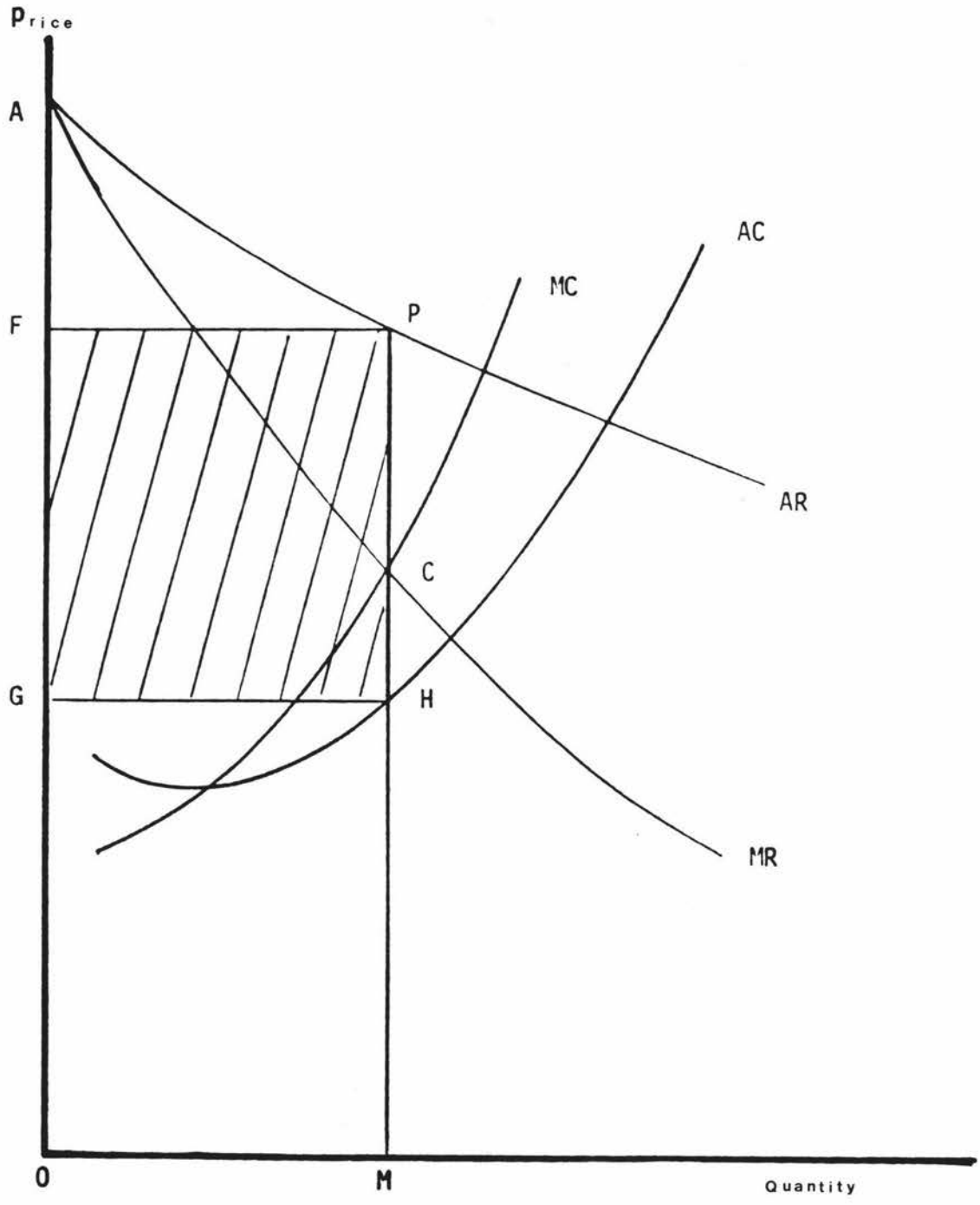


Figure 1.1 - The equilibrium of a monopolist (Robinson 1965)

AR = Average revenue
MR = Marginal revenue
AC = Average cost
MC = Marginal cost
q = Quantity
p = Price

An extension of the theory of monopoly is the case where the number of sellers in a market is greater than one, but still small enough to have some influence upon market price and total supply. This leads to the theory of oligopoly which is concerned not only with the problem of an individual equilibrium but with the group equilibrium as well.

1.3.2 - Oligopoly

Oligopoly is present in a market when the number of sellers is greater than one but small enough so that the action of any of them has influence upon the market price.

In oligopolistic industries firms react both to the economic forces around them and to other firms' behaviour. Firms have to take into account the effects of their actions on the total market balance of supply and demand, and therefore on the market prices, as well as the effect of their actions on the other firms and their subsequent reactions.

The results of oligopolistic competition vary a great deal depending on the degree of interdependence among firms. Chamberlin (1962) stated that, if firms are aware of their total influence upon price and output, collusion is more likely and the price will be a monopolistic one.

A very important aspect of oligopolistic competition is analysis of the pricing behaviour of firms. Economists have developed many oligopolistic pricing theories based on behavioural patterns which are thought to occur under oligopoly. There have been several important contributions to the theory of oligopoly pricing. The first, postulated by Cournot, approached the problem on the assumption that each firm acts independently (Henderson and Quandt 1958). Other theories have been formulated in order to explain the phenomena of price rigidity in certain oligopolistic markets. The kinked demand curve theory illustrates why oligopolistic firms try to avoid independent price cutting (Stigler 1947). Scherer (1970) asserted that this theory explains better why prices are maintained at certain levels rather than how these levels are attained. Rothschild (1947) pointed out that the theory of oligopoly does not provide a unique theoretical model from cost and demand conditions to price equilibria. Other theories of oligopolistic pricing indicate that under the profit

maximisation hypothesis, pricing decisions are usually interdependent, as individual firms recognise that attainable profits could be higher when co-operative policies are pursued. Still, co-ordination of pricing policies is not easy when cost and market share disparities engender conflicting price and output preferences among firms in the industry.

Under the assumption that oligopolistic pricing predicts a tendency towards maximisation of industry profits, the question of how oligopolistic industries co-ordinate their pricing decisions in the market is posed. Several forms and degrees of collusion can take place in a market system. Examples of collusion are mergers, cartels, price leadership, price agreements and tacit co-ordination.

Stigler (1964) pointed out that oligopolists tend to collude in order to maximise profits. The goal of the collusive oligopolist would be the joint determination of outputs and prices by independent firms. He also argued that co-ordinated policies of fixing market shares are an efficient method to avoid price cutting and that co-ordinated policies of fixing prices usually lead to heterogeneity of products.

The more recent thinking on oligopoly theory, as reflected by Bhaghwati (1970), focuses on "potential" competitors and on product differentiation. If firms in an industry want to maintain their market power, potential competitors have to be discouraged from entering the industry. This has been the subject of a whole range of literature under the general topic of "barriers to entry".

1.3.2.1 - Condition of entry

Caves (1967:22) referred to the condition of entry as another major segment of a firm's economic environment, thus; "just as concentration reflects the number of actual market rivals of a firm, so the condition of entry tells the story about potential rivals". The condition of entry or the height of barriers to new entry to a market was defined by Bain (1965:4) as the extent to which established sellers have advantage over potential entrant sellers, and it can be measured as "the percentage by which established firms can raise price above a specified competitive level without attracting new entry". The highest selling price that es-

tablished firms in an industry can persistently charge without attracting new entry may be referred to as the maximum entry forestalling price.

Also according to Bain (1965), the definition of entry includes only the establishment of an independent new entry or, in other words, the addition to the industry capacity by a new firm. This excludes the changing of hands of an existing firm and the expansion of capacity of an established firm. Hines (1957) disagreed with this concept and considered that Bain's exclusions were incorrect since the effect on the market of any new expansion of capacity would be the same as if a new entry had been accomplished.

The main sources for development of barriers to entry are economies of large scale, absolute cost advantages, product differentiation, and legislation restricting entry by means of licensing. Caves (1967:24) stated that, "scale economy barriers to entry arise when firms do not achieve the lowest possible production costs until they have grown to occupy a large portion of the national market". Absolute cost advantages are present when the new firm faces a cost disadvantage over the old one at any output level at which it chooses to produce. These absolute cost barriers may arise from sources such as control of techniques (patents, operational licences, secrecy, etc.), purchases of factors at lower price, and capital requirements for entry.

1.3.2.2 - Product differentiation

Product differentiation occurs when products in a market can be identified with a particular firm. Bain (1968:223) noted that "the degree of product differentiation refers to the extent to which buyers differentiate, distinguish, or have specific preferences among the competing outputs of the various sellers established in an industry..... In technical terms, it measures the degree of imperfection of 'substitutability' (to buyers) of the various outputs of an industry". Degree of substitutability of any two different outputs could be measured by the cross-elasticity of demand between them. Cross-elasticity is the responsiveness of the sales volume of one output to a change in the price of the other.

Sources of product differentiation are many but the most obvious ones

seem to be the quality and design of products. Caves (1967) emphasised that as soon as buyers can recognise one producer's output and distinguish it from another's, they are no longer "undifferentiated". He also noted (Caves 1967:19) that "brands of a product can also be differentiated in ways not built into the product itself".

Presence of product differentiation can be established by measurement of the principal effects of differentiation on the market forces. The one most frequently emphasised in the literature of economic theory is that of the individual seller who is able to raise his price above that of his rivals while at the same time retaining the customers who prefer his product. The importance of product differentiation lies in its effect on consumers and in the impact it produces on prices. However, price differences are not the only consequence of product differentiation among established firms. Frequently the force of existing product preferences may be shown in the disparity of the market shares. Bain (1968) concluded that there appears to be a significant interrelationship between the degree of product differentiation and the degree of seller concentration.

1.4 - Research procedure

The theoretical approach presented in this chapter has been used as a base for an orientation of the industry study and for identification of areas to be investigated.

Gathering of empirical evidence has been carried out using two data collection methods: one based on aggregated industry data obtained from statistical sources, and the other on direct information from individual firms. For this purpose a survey was conducted in 1973 using a sample of individual firms. Unfortunately the survey was unsuccessful in providing empirical answers to theoretical predictions, due to the lack of co-operation from most of the winemakers sampled in the survey. In 1973 personal contact was also made with all winemakers in the sample.

In 1981 another attempt was made to gather information through a mailed questionnaire, which was also unsuccessful. Personal contact was again made with some of the managers of important firms and with people related to the industry. Available data from published sources and information

obtained by direct approach were often not sufficient to support the type of analysis proposed. However, information obtained from interviews has been used to formulate plausible interpretations of the industry's behaviour wherever possible. This information will hereafter be referred to as "private communication".

References are often made throughout the thesis to the report of the 1980 Industries Development Commission (IDC). This government inquiry was initiated by references made to industry studies in the 1975 Budget. Following this, in 1978, the Wine Institute of New Zealand Inc. presented a study of the wine industry with a number of requests to government. On 30 August 1979 the Minister of Trade and Industry directed the IDC to appraise the study and development plan of the wine industry. The terms of reference were (N.Z. Dept of Trade and Industry 1980:viii):

"1. To appraise the study and development plan, including the potential of the industry to contribute to New Zealand's future economic growth and taking into account the interests of the wine producing industry, consumers and the distributive trade.

2. To recommend any variations to the plan.

3. To recommend a strategy for future development of the industry and action by the industry itself, other associated sectors and the government."

The final recommendations of the Commission aimed, as stated in the report, at the creation of market conditions conducive to improvement in quality of domestic wines and containment of prices, so that consumers could be supplied with their requirements as satisfactorily as possible.

1.5 - Summary

This chapter has presented a brief theoretical description of the systems of perfect and imperfect competition. The purpose has been to provide a framework of analysis for the system under which the wine industry operates and to provide a base for discussion of some of the likely effects that the industry's structure and behaviour have on consumer interest.

The theoretical background on oligopoly presented in this chapter draws attention to structural and behavioural aspects of oligopolistic industries and to the way in which a departure from principles of pure competition can affect consumer welfare.

This chapter has also outlined the research methods that have been applied to the study of production and distribution of wine in New Zealand.

CHAPTER 2

HISTORICAL BACKGROUND

2.0 - Introduction

The New Zealand wine industry has some characteristics which are unique among the industries of wine producing countries. Most of the major producing nations have a long tradition in wine-making that goes back hundreds and even thousands of years. By comparison the New Zealand wine industry is very young and is still in early stages of development.

The New Zealand wine industry was initially orientated solely to supplying an internal market, and a population without wine drinking traditions. These two factors have influenced the industry's pattern of development.

Initially the industry experienced a steady but slow growth. It is only over the last two decades that the industry has gone through a rapid expansion accompanied by major changes in its structure.

To understand the present structure of the industry it is helpful to follow the early stages of development of grape growing, wine-making and wine consumption in a society with a conservative attitude towards alcohol consumption. Early legislation concerning the regulation of wine-making practices and liquor sales is also discussed in this chapter.

2.1 - Historical development of the wine industry in New Zealand

2.1.1 - The first winemakers

Viticulture in New Zealand began in the early nineteenth century. Origins of wine-making are rather obscure, but it appears that the first vines were planted by the Reverend Samuel Marsden at his Kerikeri mission station in 1819. Later, grapevines were planted near Napier by the Marist Brothers, a French monastic order. In 1865 they established what is now the oldest vineyard in New Zealand. The purpose of these plantings was to provide wine for religious uses (Scott 1964).

The first commercial vineyard was planted in the Bay of Islands by James Busby, and production began in 1840. The next commercial winemakers were the Levet family who established a vineyard at Wellsford in 1862, and earned a living exclusively from their wine-making. The wines produced in those days were Port, Sherry and Madeira, all unfortified and matured in oak for 5 years. After the first generation, the Levet family did not continue in the wine-making business (Scott 1964).

In 1865 José Soler, a Spanish winemaker, planted vine cuttings along the upper reaches of the Wanganui River. He made a wide range of wines maturing them for 8 years before they were sold. He did not use sugar in the fermentation process. For the first time New Zealand wines received prizes at international exhibitions. According to Scott (1964), Soler's wines took six prizes at the Melbourne International Exhibition in 1880. At the London Colonial and Indian Exhibition in 1886 his wines were placed third in competition with entries from all colonies, including South Africa. In 1906 at the Christchurch International Exhibition Soler received three gold medals for his wines.

In 1900, Soler's nephew, José Vidal, also from Spain, unsuccessfully experimented with grape growing in the Hokowhitu area of Palmerston North. He finally moved to Hawkes Bay and he set up a wine-making concern which still exists under the name of "Vidal's Wines".

In 1870 German immigrants arrived in the country. One of them, Heinrich Breidecker, established a vineyard at New Plymouth, moving later to Hokianga. This German family planted several acres of vines at Kohukohu and produced a good unadulterated wine similar to Rhine wines. They won prizes for Hock at the Dunedin Exhibition.

After the success of these European immigrants, other landowners were encouraged to venture into viticulture. One of them was William Beetham, who spent several years in France, and on his return to New Zealand, planted eight acres of vines at Masterton. He experimented with new varieties such as Pinot Noir, Pinot Meunier, Hermitage, Black Hamburgh, Black Muscat, Golden Chasselas and Doradillo. From this point at the turn of the century the history of viticulture was no longer the history of isolated experiments. Wine-making became a profitable business

proposition which was carried out by a number of landowners (Scott 1964).

In 1892, when the Department of Agriculture was established, the services of a viticultural adviser were sought. An Italian viticulturist, Romeo Bragato, was appointed to the position (Thorpy 1971). He recommended the establishment of a technical college of viticulture under the supervision of the Department of Agriculture, but his advice was never taken. Another of his recommendations was the establishment of a winemakers' co-operative in each district, along the lines of the co-operatives being established at that time by the dairy industry. Two associations were formed: the Central Otago Vine and Fruit Growers' Ass., and the North Auckland Vine Growers' Ass., both of which helped distribute European cuttings and experimented with varieties best suited to each district (Scott 1964). However, the major aim of the winemakers' co-operatives, that is, the establishment of a common winery for joint wine-making, was not achieved.

In 1890 the disease that had destroyed European vines 20 years previously, occurred in New Zealand. The presence of phylloxera had been suspected since 1885, but it was not positively identified until 1895 by Bragato. He advised that there was no alternative to destroying diseased vines, and replacing them with imported American disease-resistant vines. Resistant root stock could then be grafted with European varieties. The government tried to persuade the growers to take these measures voluntarily, but because no financial assistance was offered to them, some refused to take such drastic action. Later, however, this course of action became compulsory and inspectors with wide powers to inspect any vineyards and destroy all infected vines were appointed. The vineyards were replanted with new hybrid, disease-resistant vines. However, many of the growers did not graft them with European classical varieties. Hybrid varieties produce greater quantities of grapes, but the wine is of inferior quality. The process of replacement was expensive. The government covered some of the costs but did not indemnify growers for the losses they suffered, as it had done for farmers forced to destroy diseased cattle. Phylloxera aphids were still found in Henderson vineyards in 1972 and 1973 but these isolated cases were kept under control by DSIR experts.

In 1897 the Department of Agriculture established the Te Kauwhata Viticulture Research Station which, under the direction of Bragato, became a training centre for instruction in wine-making and viticulture. Some new vineyards were established in Henderson by Dalmatians. Originally gum diggers, many of them turned to vine growing to which they brought some expertise from their country of origin. They settled in the north, around Auckland, growing vines and fruit trees. Some of these early growers established the foundations of what are now important firms.

Early in the 20th century the Prohibition movement affected the progress of the wine industry. Many winemakers were discouraged by the creation of no-licence districts and they turned to other agricultural activities. In 1908, the Te Kauwhata Research Station was taken over by the Livestock and Agriculture Division of the Department of Agriculture (Corban 1974). Bragato resigned in 1909 from his position of government viticulturist and went to Canada.

2.1.2 - Winemakers' Associations, government lobbying and its effect on legislation

The Licensing Amendment Act 1914 introduced the licensing of winemakers. Prime Minister Massey made a strong attack on winemakers and the beverage they produced. In 1915 only 35 winemakers' licences were issued.

The Licensing Amendment Act 1918, made provision for the taking of Special Licensing Polls and the choices proposed were either voting for National Continuance or voting for National Prohibition.

In the 1919 poll the civilian population favoured prohibition, but the votes of the soldiers returning from the Great War saved the wine industry from complete prohibition.

The New Zealand Viticultural Association was formed in 1912 and from this period on winemakers have been an active lobbying group. In 1918 the Licensing Control Commission reported in favour of protection for the industry. However this recommendation was not acted upon. In 1932 during the Depression, the National Government imposed a 5% sales tax on New Zealand wine (Corban 1974).

"Official encouragement returned when the Labour Government was elected to the Treasury benches in 1935" (Corban 1974:15). The Te Kauwhata Station, which was inoperative since 1933, was reopened. Another viticultural adviser was appointed from Australia and the government provided funds to install new machinery and equipment. Since the expansion of the wine industry was considered in the national interest, the Import Control Regulations of 1938 limited imports of overseas wines. From 1940 to 1950 many new growers joined the industry and the acreage planted increased by more than 300%. The average size of the holdings was less than 5 acres.

Due to lack of knowledge on the part of the winemakers and lack of assistance and control on the part of the viticultural adviser at that time, some of the new vineyards were planted with inappropriate varieties, unsuitable for wine-making (Scott 1964).

In 1945 a New Zealand Royal Commission on Licensing (Report 1946:10) was set up under the following terms of reference: "To inquire into and report upon the working of the laws relating to the manufacture and importation, sale and supply, whether by wholesale or retail, of intoxicating liquors, and the social and economic aspects of the question and proposals that may be made for amending the law in the public interest.....".

The report of the New Zealand Royal Commission on Licensing (1946) discussed the addition of cane sugar at length and recommended that it would be desirable to reduce the quantity of cane sugar used in the making of wine. Contrary to the legislation elsewhere, New Zealand legislation permitted the addition of cane sugar up to 3 lbs per gallon of grape juice for sweet wines and up to half a pound per gallon of grape juice for table wines. The Commission also discussed the addition of water to grape juice and concluded that in order to reduce the acidity of New Zealand wine this practice should be accepted, but recommended that it should be used with great moderation. As far as the production of fortifying spirits was concerned the Commission said that the matter required further investigation. The debate was whether the use of marc (byproduct) and cane sugar should be allowed for the making of fortifying spirits or whether they should be distilled from poor wine.

The Commission recommended some reforms including tariff and tax adjustments, sales liberalisation, and employment of an independent expert to study the prospects for co-operative manufacture of wine, and to investigate the use of cane sugar, blending, and all other technical matters. The government, however, did not take advantage of the favourable situation of the postwar years to implement these recommendations. Scott (1964:72) stated that: "the spirit of enquiry and reform died with the commission, embalmed in a 450-page printed report on the licensing laws...".

In 1943 a clash of interest between large and small growers caused the formation of two organizations: the New Zealand Wine Council Inc., representing larger growers and the Viticultural Association of New Zealand Inc., representing small growers. Shortly after this, Hawkes Bay growers formed the Hawkes Bay Grape Winemakers Association Inc. In the initial stages the three organizations worked separately and presented opposing submissions to the 1945 Royal Commission. The Viticultural Association of New Zealand Inc. complained that the interests of large growers were favoured in order to force small growers out of business. In 1948 the threat of an Australian company entering New Zealand brought the three organizations together under the Wine Manufacturers' Federation of New Zealand, but they still retained their initial identities. Separate submissions were made to the Parliamentary Select Committee in 1958 and to the Royal Commission in 1974. They made a joint approach to the government on issues of common interest such as tariffs and sales tax.

In 1971 the formation of a national body, the Wine Institute of New Zealand (WINZ), was announced. Agreement was reached by the three industry organizations to be represented by an executive of 7 persons to form the board of management of the WINZ; of the seven-man executive, two were to be elected by winemakers who produced less than 1,000 hectolitres annually, two by intermediate producers (between 1,000 and 10,000 hectolitres), and three by those producing more than 10,000 hectolitres a year. The executive was to work under the principle of one vote per person. The chairman was elected by the members of the executive and had a deliberative vote, not a casting vote. Financing of the organization was established on the basis of $25 per winemaker's licence, and a $3 levy per 45 hectolitres of wine produced.

This system of representation favours the large winemakers, who control 43% of the votes. Three votes in the executive represent the 4 largest winemakers in the industry, 2 votes represent perhaps 10% of the winemakers, and only 2 votes represent more than 100 winemakers, or 90% of the winemakers' licences.

One of the aims of the Wine Institute is to promote or oppose legislation affecting the wine-making industry in New Zealand. Late in 1975, the Institute commenced an industry assessment study in response to references to Industry Studies in the Budget of that year. In 1978 the Wine Institute presented an Industry Study and Development Plan to the Industries Development Commission (IDC) which was the basis for the IDC report to government (Section 7.6).

2.2 - Developments in wine consumption in New Zealand

The attitude towards wine in New Zealand has been widely influenced by society's attitude towards alcohol in general. Liquor was introduced in New Zealand by the early settlers and grog shops and traders were already present by the 1820's (Bollinger 1959). Apparently the controlling of the liquor trade through licensing laws in New Zealand was initially based on the British system.

In New Zealand movements actively working against the liberalisation of the licensing system have been the Temperance and Prohibition movements. The first Temperance meeting in New Zealand took place in a Methodist mission in 1834 (Bollinger 1959).

Another contributing factor to legal restrictions on liquor sales was the effect the introduction of liquor had on the Maori population. The Sale of Spirits to Natives Ordinance of 1847 was an example of special restrictions on drinking by Maoris.

The Temperance movement acted as a pressure group to bring changes in legislation. Its first success was the Licensing Act of 1881 which introduced a triennial local poll in which only ratepayers were allowed to vote on the issue of increasing the number of licences. These polls always resulted in "No-licence" victories, which effectively froze the

number of licences in New Zealand. In 1902 for the first time the "No-licence" vote cast in all districts throughout the country exceeded the Continuance vote. From then on the prohibitionists' activities were mainly directed towards obtaining a National Prohibition poll. This was achieved in 1911. In 1912 the highest ever vote for Prohibition was cast (55.83% of the total vote).

These historical facts give a perspective of the New Zealand society's attitude towards alcohol. (At present, the prohibitionist proportion of the population is about 20%. This group is politically active in its lobbying against alcohol consumption.)

The New Zealand Royal Commission on the Sale of Liquor in New Zealand (Report 1974) received a total of 226 submissions from a wide section of the community and only very few of them advocated the abolition of all controls relating to the sale and consumption of liquor. The Commission recommended that the sale and consumption of liquor in New Zealand should remain under legislative control.

For many years consumption of alcohol in New Zealand had been unsophisticated, associated with males crowding bars, restriction of drinking hours (six o'clock in the past - ten o'clock closing at present), no food with drink, and no minors in premises where alcohol was sold. Although wine is increasing in acceptance as the beverage of moderation and as an accompaniment to food, the Wine Institute remarked that there are disincentives to future growth in the consumption of wine. The Wine Institute referred mainly to the activities of the Alcoholic Liquor Advisory Council (ALAC) and the New Zealand Planning Council which related increasing wine consumption to health problems (WINZ, Oct. 1979).

The Customs Department estimated that consumption of wine per head of population in 1945 was 1.5 litres. By 1963 the per capita consumption of wine in New Zealand had increased to 2.5 litres (Table A.9). Consumption of wine increased at an average rate of 15% per annum during the late 1960's and early 1970's and at a lower rate of 5% per annum in the late 1970's. In 1980 wine consumption reached 13 litres per head of population. The Wine Institute has projected a rise in per capita

consumption to 16 litres by 1986 (WINZ, Feb. 1979). This is a low level of consumption compared with wine producing countries in Europe with a longer tradition in wine production and consumption. In the 1970 five-yearly survey issued by the "Office International de la Vigne et du Vin" (OIV 1970), Italy and France showed a consumption per capita over one hundred litres while New Zealand showed a consumption per capita of 5.5 litres for the same period.

Several factors have contributed to the increase in total wine consumption. These include proportionate increases in the adult population, increases in the disposable income, greater availability of wine, change in drinking habits and greater acceptance of wine as a social drink. However, further growth in demand is thought to depend also on the quality of wine, wine prices and product promotion.

2.3 - Summary

The New Zealand wine industry began with the private initiative of individuals who started wine-making on a small scale and without government help. The industry survived and progressed in spite of setbacks such as phylloxera, the prohibition movement, and the Depression of the 1930's.

Until 1974 winemakers were represented by three separate bodies which sometimes had opposing views and interests, but finally in August of that year the Wine Institute was established as a central body for the industry.

Early developments of the young industry were affected by government legislation. Some regulations offered protection to the wine industry and were intended to encourage the industry's growth (1938 Import Control Regulations), while others served as deterrents to the increase in alcohol consumption. These legislative patterns have continued up to the present time. A list of government regulations and submissions presented to government mentioned in this chapter is given in Table 2.1.

Table 2.1 - List of government legislation and submissions to government mentioned in Chapter 2

Year	Legislation, Submission
1847	Sale of Spirits to Natives Ordinance - Special restriction on drinking by Maoris
1881	Licensing Act - Freezing of the number of sales licences in New Zealand
1911	National Prohibition Bill - Introduction of a national poll on prohibition or continuance
1914	Licensing Amendment Act - Introduction of the licensing of winemakers
1918	Licensing Control Commission Report - Favouring protection of the industry
1918	Licensing Amendment Act - Introduction of special licensing polls
1938	Import Control Regulations - Limitation of overseas wine imports
1945	Submissions of the Royal Commission on Licensing
1946	Royal Commission on Licensing Report - Recommendation to reduce the amount of sugar added to grape juice
1958	Submissions to the Parliamentary Select Committee
1973	Submissions to the Royal Commission on "The sale of Liquor in New Zealand" - Few advocated the abolition of all controls
1974	Royal Commission Report - Recommendation that the sale and consumption of liquor in New Zealand remain under legislative control.
1978	Presentation by the WINZ of an industry study and development plan to the IDC
1980	IDC Report

CHAPTER 3

TRENDS OF SUPPLY AND DEMAND

3.0 - Introduction

This chapter presents a brief approach to the theory of demand and supply as it relates to the wine industry. General trends of production of, and demand for, wine in New Zealand are considered.

In recent years changes in wine consumption patterns have been evident in New Zealand. The growth of demand has been due to a combination of factors external and internal to the market system. Forces external to the market can originate from population increases and rising levels of disposable income. Demand can also be internally stimulated through product promotion directed to provoke changes in consumers' attitudes towards a particular product.

The growth of wine production has been influenced by past commitments (e.g., plantings, investment), government encouragement, and future expectations of prices and demand.

In this chapter, past rates of annual growth of production, consumption and other variables have been estimated with the application of regression analysis (Table A.10) to available statistical data (Tables A.1 to A.9). Exponential and linear functions have been applied to yearly statistical data from 1960 to 1980 for each variable listed in Table A.10. Coefficients of determination (r^2) of exponential functions and of linear functions applied to the same variables are shown also in Table A.10.

3.1 - Theoretical approach to supply and demand analysis

Notions of supply and demand are as follows (Lipsey 1971):

- Demand for a commodity can be defined as the various quantities of that commodity that consumers wish to purchase at a schedule of prices.

- Market demand for a commodity is the aggregation of all demand schedules.
- A demand curve is the functional relation between quantity demanded and price during a given period of time (the inverse relationship between price and quantity demanded is represented by a downward sloping curve). A movement along the demand curve indicates a change in the quantity demanded in response to a price change while a shift of the demand curve indicates a change in the quantity demanded in response to changes in other factors including income, taste and prices of other commodities.
- Supply of a commodity can be defined as the various quantities of that commodity that producers wish to offer at a schedule of prices.
- Market supply of a commodity is the aggregation of all supply schedules.
- A supply curve is the functional relation between price and quantity supplied during a given period of time (the direct relationship between price and quantity is represented by an upward sloping curve). Movements along the supply curve are directly caused by changes in price while shifts in the supply curve are caused by other factors like changes in input prices, in the profitability of substitute commodities, in technology, in government policies and other environmental conditions.

In theory, market prices result from interaction between market forces of supply and demand. Price-quantity adjustments occur when changes in supply and demand conditions cause disequilibria. Under competitive conditions, price is determined at a point where the market supply curve intersects the market demand curve, that is market supply equals market demand. This price is called the equilibrium price.

If the quantity offered is greater than that which consumers are willing to buy, producers will offer their product at a lower price. Lower prices will discourage production and encourage consumption. The process will continue until a new equilibrium price-quantity is achieved (Dahl and Hammond 1977).

Market adjustments in competitive markets can take place in the short-run and/or in the long-run. Short-run price adjustments, in agricultural markets, are usually made from one cropping season to the next. Longer periods of time permit the entry or exit of firms into or from the market, as well as the expansion or reduction of the size of existing firms, depending on profit levels (Dahl and Hammond 1977).

A number of researchers have found that in actual market situations, for agricultural products, changes in quantity to a given price change are larger for price increases than for price decreases (Dahl and Hammond 1977). Often a rise in price for agricultural products results in an increase in the quantity offered and also in improved technologies in the long-run, whereas a reduction in price does not always result in an immediate reduction of output. The reasons for this are varied including planned expansion of production of some crops which can take several years, limited alternatives for some resources, high proportion of fixed outputs and fixed resource commitments (Tomek and Robinson 1973).

Under competitive conditions, market supply and demand functions appear horizontal to individuals because they have no influence on price (Section 1.1).

In a monopoly situation, the demand curve the monopolist faces is the market demand curve and this would be his average revenue curve. As the marginal revenue curve for the monopolist lies below the average revenue curve and the marginal cost curve lies above the average cost curve (Figure 1.1 - Section 1.3.1), the equilibrium position would correspond to a price level higher than that of a competitive industry.

Under conditions of oligopoly "price is often not the key variable which equates demand and supply" (Lipsey 1971:323). Where a few producers have control over market forces it is likely that prices would be kept fixed and producers would resort to other market adjustments and compete in terms of other factors (Section 1.3.2).

3.2 - Trends of supply

In this section, consideration is given to wine-making practices, to changing trends in grape growing and wine production and to inventory policies of the industry.

3.2.1 - Wine production

The present study is concerned only with production and demand of wine from grapes. Fruit wine production was less than 0.05% of total wine production over the period of analysis (Table A.1).

From 1960 to 1972 wine production had a 16% annual growth rate (Table 3.1). In 1972 there was a peak in total wine production (Figure 3.1). At that point supply exceeded demand by 10 million litres as the increase in demand during the previous years, although considerable, did not grow as much as production. Winemakers could have either lowered prices to encourage consumption or reduced output in order to maintain prices. They did the latter (the interpretation of these facts is discussed in Chapter 6). Wine production declined slightly in 1973 and quite significantly, by 8 million litres (25% of total production), in 1974. According to wine-makers, there were two main reasons for such a sudden decline in production. These were: light crops in two consecutive years and the replacement of hybrid vines with vinifera vines (classical varieties) in some vineyards (private communication).

The average annual growth rate of wine production over the 1960-80 period was 12% (Table 3.1). During the same period a change in the pattern of production from dessert wines to table wines took place. Table wine production increased by 21% per annum, while that of dessert wine increased by only 6% per annum (Table 3.1). Table A.1 shows that in 1960, production of dessert wines was higher than that of table wines by 3 million litres, and in 1979 table wine surpassed dessert wine by 20 million litres.

The Auckland region contributed 56% of the total wine produced in 1979, 38% was produced in the East Coast region and the remaining 6% was produced in the South Island.

Table 3.1 - Growth rates

Variable	Average percentage annual increase (1960 to 1972)	Average percentage annual increase (1960 to 1980)
Vineyard	-	13%
Grape production	-	12%
Wine production	16%	12%
Table wine production	-	21%
Dessert wine production	-	6%
Sales	-	12%
Stocks	-	11%
Consumption	13%	12%

Source: Table A.10 - All of the above percentages were calculated from statistical data. Data for the years 1960-79 were obtained from Monthly abstract of statistics (see Tables in Appendix A), and data for 1980 were obtained from the Vineyard Survey 1980 report (MFA, 1981).

Unit : %

Years : 1960-1980

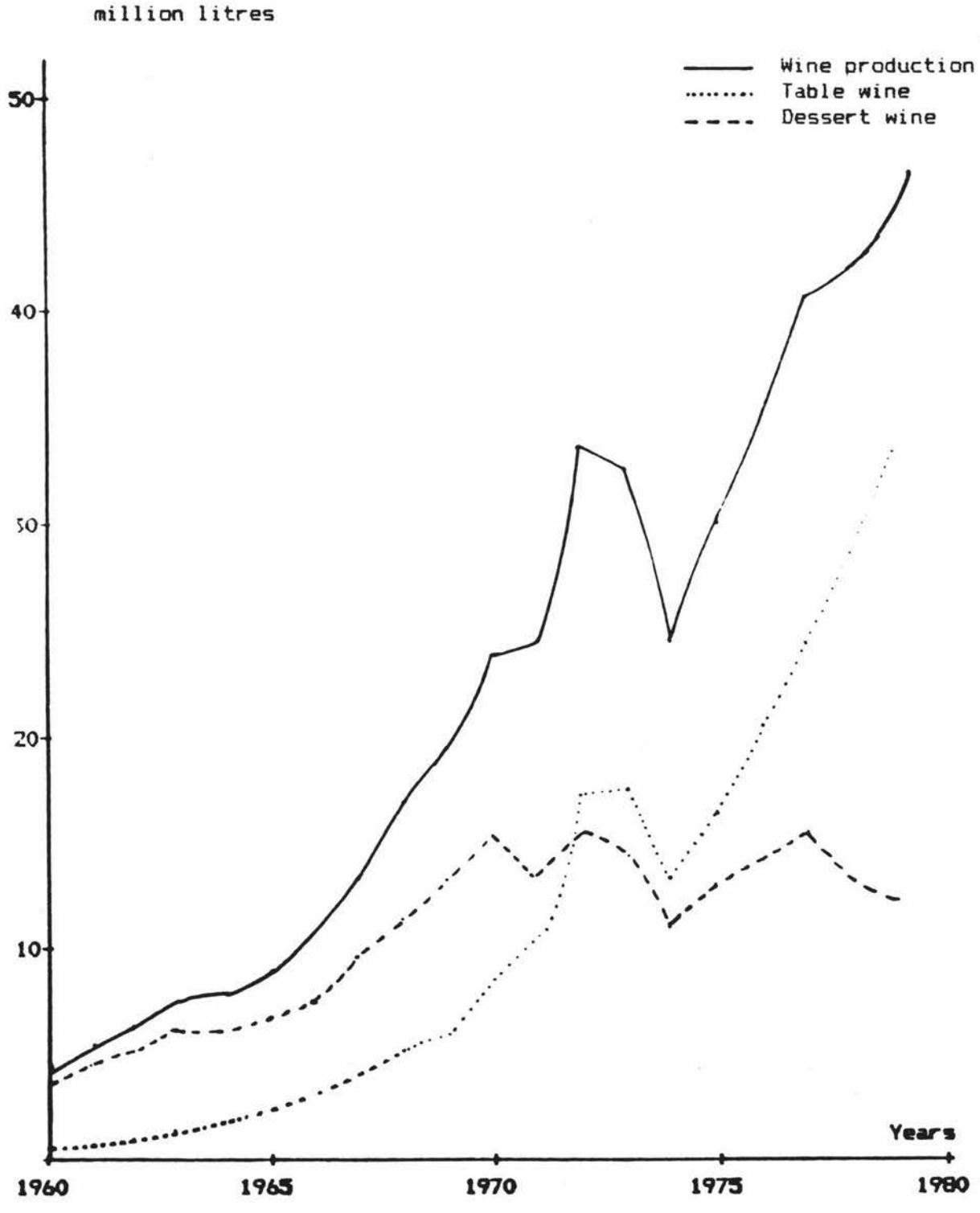


Figure 3.1 - Production of grape wine: Table and dessert

Source: Monthly abstract of statistics (Table A.1)
Unit : (000) litres
Years : 1960-79

3.2.2 - Vineyard area

Vineyard area remained unchanged from 1960 to 1967, but from 1968 onwards a big increase occurred (Figure 3.2). The average annual growth rate from 1960 to 1980 was 13% (Tables 3.1 and A.2).

In 1970 vinifera varieties accounted for 57% of the total area (Berrysmith 1971) whereas in 1965 only 32% of the area was planted with vinifera and the remaining 68% with hybrids.

The vineyard survey of 1975 (Berrysmith 1976) showed that 355 commercial vineyards occupied an area of 2,351 hectares (Table 3.2) with almost 4 million vines. This represented a density of 1,700 vines per hectare. More than 70% of the total area in 1975 was planted with vinifera varieties.

The minimum size of vineyards recorded in the 1975 survey was 0.2 hectares, and the average size 6.6 hectares, although nearly 70% of the commercial vineyards had less than 4 hectares. The distribution of vineyards in New Zealand is shown in Table 3.2. Of the commercial vineyards, 40% were located in the Auckland area. Of the 4 million vines recorded in 1975, one third were not productive. In other words, 870 hectares (37% of the total area) was "non-bearing" land.

The 1980 vineyard survey showed that 4,785 hectares of vineyard were occupied, doubling the number of hectares recorded in the previous survey. But of the total, 2,391 hectares were new plantings and not yet capable of bearing grapes (50% of total area). This survey also showed that 3,719 hectares were planted with white viniferas which represented 78% of total plantings (MAF 1981).

The Wine Institute (WINZ, Oct. 1979) referred to plantings in 1978 which increased the vineyard area to 4,200 hectares and to 5,000 hectares in 1979. These figures are higher than those given in the 1980 survey. The Industry Study estimated that by 1986 vineyards would occupy between 6,602 and 6,937 hectares, of which 20% would still be non-productive.

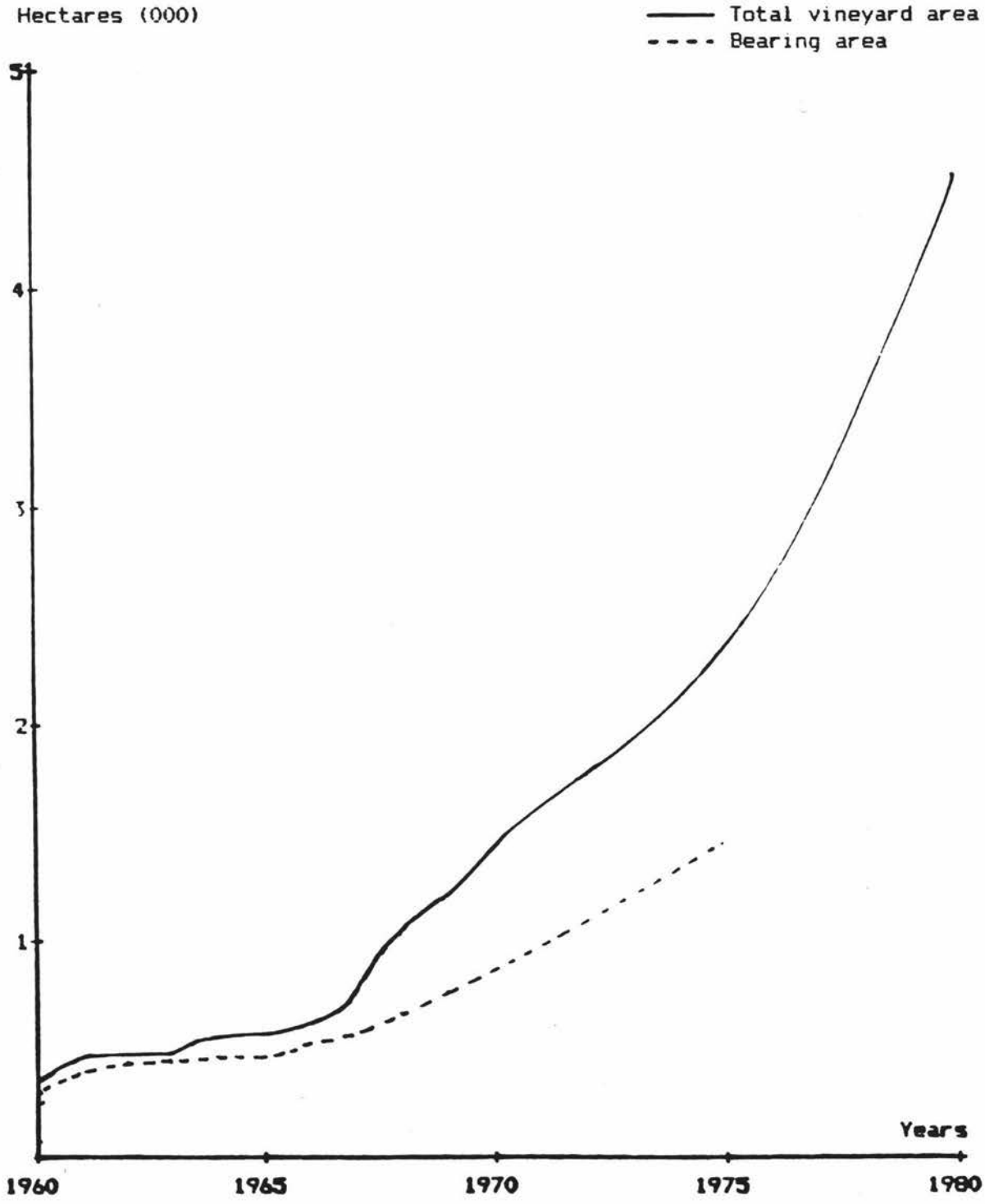


Figure 3.2 - Vineyard area

Source : Monthly abstract of statistics (Table A.2)
Unit : Hectares
Years : 1960-1980

Table 3.2 - Area in vines and number of growers

	Area in vines (hectares)	Number of Growers
Northland (Waihopo to Kaiwaka)	22	20
Auckland (Warkworth to Pukekohe)	750	145
Waikato (Thames to Huntly)	274	38
Bay of Plenty	1	1
Poverty Bay (Ormond to Manutuke)	611	98
Hawkes Bay (Eskdale to Havelock North)	537	39
Taranaki/Wellington	2	2
Nelson	6	10
Marlborough	175	2
National total: 1960	388	161
1965	507	168
1970	1468	320
1975	2351	355
1980	-	567 *

Source: Five Yearly Vineyard Survey (1975) * (1980)

Table 3.3 - Yields and ratios

	59-60	60-61	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70	70-71	71-72	72-73	75-76	1979
Tonnes of grapes/ Bearing hectares	11.487	11.236	12.212	12.868	13.104	14.309	13.781	15.208	16.018							
Litres of wine/ Bearing hectares	10,284	10,262	11,901	13,305	15,067	15,909	16,370	17,627	20,097							
Ratios:																
litres of wine/ kg of grapes	0.75	0.80	0.82	0.91	1.00	0.99	1.06	1.01	1.09	1.10	1.08	1.05	0.83	1.10	1.50	1.22*

Source : (Calculated from monthly abstract of statistics' data)
Data on tonnes of Grapes have been discontinued
* Report of the Industries Development Commission

Expansion of vineyard area from 1968 onwards was catalysed by a combination of factors but mainly by government protective measures and the reassurance of government support for the industry in the 1968 Budget.

3.2.3 - Grape production

Grape production in New Zealand is recorded in Table A.3 during the period 1960 to 1979, except for the years 1973-74 to 1977-78, for which data was not available. In 1980, total grape production was about 40,000 tonnes from which 30 million litres of grape juice were extracted (MAF 1981). Total grape production experienced an annual growth rate of 12% (Table 3.1). In New Zealand most of the grapes produced are used for wine-making.

In 1960, the amount of grapes from own vineyards was higher than the amount of grapes purchased by contract (own vineyards are vineyards owned by winemakers as against vineyards in the hands of contract growers), but after 1977 this situation was reversed (Figure 3.3). At the beginning of the period under study only 4% of the grapes were bought by winemakers from contract growers, while in the year 1975-76, 35% of the grapes were purchased under contract. By 1980 62% of the grapes were grown by contract growers. Numbers of grape growers have increased from 161 in 1966 to 567 in 1980. The main reason for this increase is that the use of land to plant vineyards has proved to be a profitable proposition and does not need the expertise required to make and market wine (Section 4.1.1).

Most of the grape varieties planted in recent years are white viniferas (some of these varieties are listed in Appendix B). Due to climatic conditions New Zealand has the potential to produce better quality white table wines than red table wines or dessert wines (Berrysmith 1968). This statement can be supported from a theory of "degree days" or heat summation figure. This measurement, established by Professor Winkler (1965), oenologist at the University of California, is the sum of the mean daily temperature above 50F during the grape maturing period of 7 months. He pointed out that below 1700 degree-days during the grape growing season, no good wine can be made. To grow grapes suitable to produce Premium table wine, between 2,000 and 2,500 degree-days are required, whereas grapes suitable to make Port, Sherry and dessert wines require more than

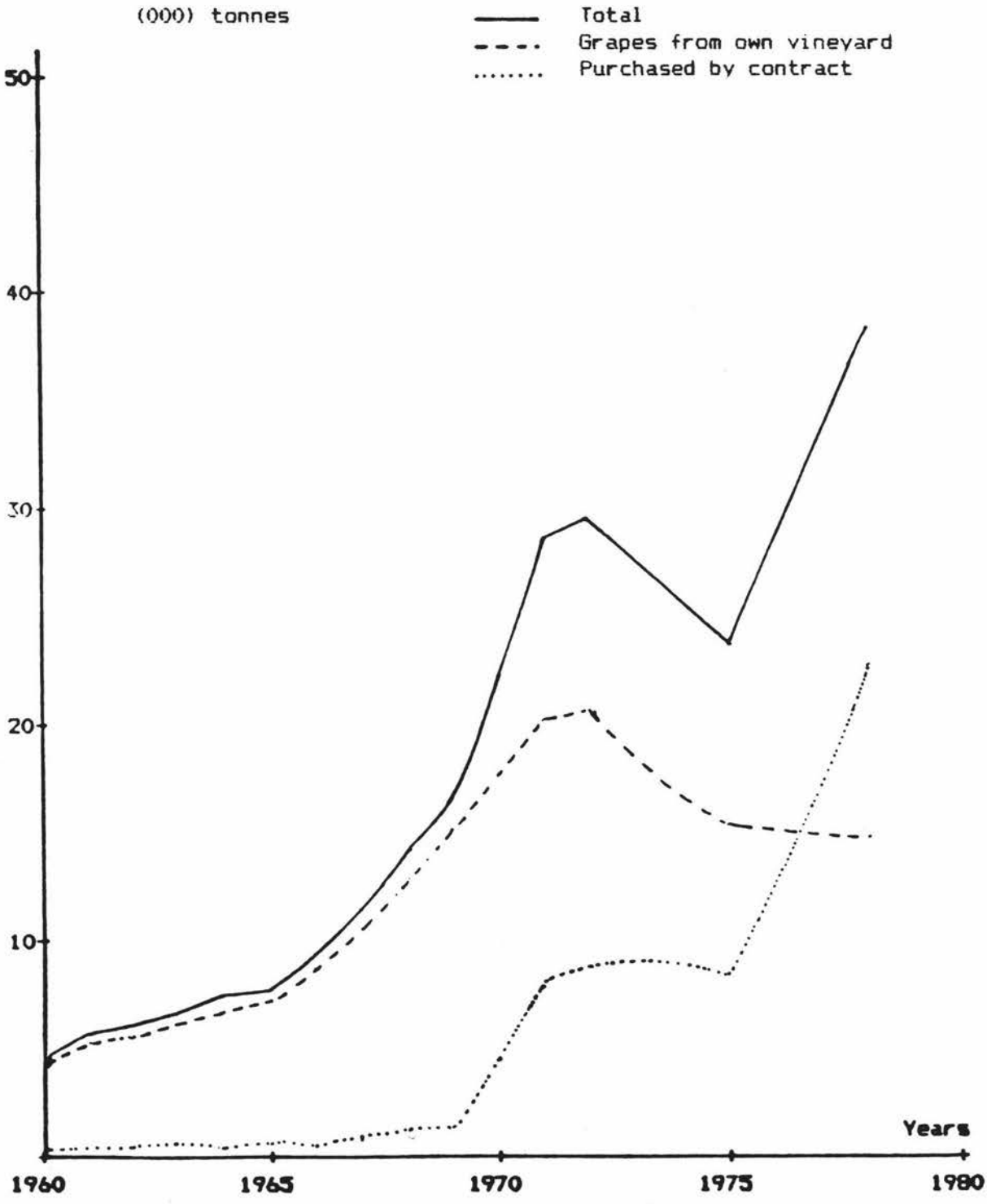


Figure 3.3 - Grape production

Source: Monthly abstracts of statistics (Table A.3)
Unit : (000) tonnes
Years : 1960-1979

3,000 degree-days. Degree-days in New Zealand grape growing areas range from 1,460 to 2,600. Thus, the New Zealand climate is better suited to production of table wines, mainly of the white German type, as climatic conditions are similar to those in some regions of Germany. The grapes are characterised by high acidity and low sugar content.

The Wine Institute in its Industry Study estimated that grape production for 1986 would be between 74,900 and 79,700 tonnes. According to this estimate, grape production would almost treble that of 1975 (WINZ, Feb. 1979).

Over the last few years there have been shortages of grapes of certain varieties. New regulations limiting addition of water for several types of wines may have influenced this development. This grape shortage has pushed grape prices up, and as a consequence, present growers and winemakers have expanded their vineyard area. New growers have also been attracted into what appears to be a profitable investment. New plantings are taking place, and when they come into production (two or three years after planting) total grape production will double. Some winemakers predicted that, depending on the conditions of demand, when all plantings come into production, there would be a grape surplus for wine production (private communication).

3.2.4 - Yields

3.2.4.1 - Tonnes of grapes per hectare

Yields vary a great deal depending on grape varieties. In general, hybrids have a higher production per hectare, and yearly crops are more constant than in the case of classical varieties, which fluctuate from year to year. Cabernet Sauvignon, for instance, has a yield of 10 to 14 tonnes per hectare compared with 20 to 25 tonnes per hectare for some hybrid varieties.

To calculate the average yield for New Zealand only the area in production should be considered. If this information is not available the total area of two years earlier should be used because new vines do not start bearing until two years after planting and they are not in full

production until 5 years after planting. Yields from 1960 to 1968 are shown in Table 3.3. The 1980 Vineyard Survey showed an average yield of 16.5 tonnes of grapes per hectare for that year.

3.2.4.2 - Litres of wine per kilogram of grapes

The average international ratio is 0.75 litres of juice from 1 kg of grapes. In New Zealand for the year 1975, based on figures from the vineyard survey, the ratio of litres of wine per kilogram of grapes was 1.5 and in 1979 was 1.22 (Table 3.3). This means that for any volume of wine produced, nearly half of the total volume was not grape juice. This is an important consideration both for the estimation of future land requirements and for the evaluation of consumer interest. The 1980 Vineyard Survey figures confirmed that the watering of wine continued as 46,647,000 litres of wine were produced from 30 million litres of grape juice (1.15 litres of wine per kg of grapes).

3.2.5 - Inputs in wine-making

The common inputs in wine-making in New Zealand are: grapes, water, sugar and fortifying spirits.

Sugar is used in the fermentation process to increase the alcohol content in the wine. It is also used, after fermentation, to give the wine the sweetness required. Table A.3 shows that for every 2.5 kg of grapes winemakers add 1 kg of sugar. As the amount of sugar added in the manufacture of each product is not known, it is not possible to assess the proportion of water and sugar added per unit of output.

Water, sugar and fortifying spirits are the main components in the making of some sherries. Fortifying spirits are produced by fermentation of "Marc" (residue left after extraction of juice from grapes).

In 1975 the volume of grape juice was only half of the final wine production, which for that year was 34.6 million litres. Of this, 18 million litres came from the fermentation of grapes. The remaining 16.6 million litres must have been other ingredients, mainly sugar and water. Some table wines had a higher proportion of grape juice than dessert wines.

Winemakers claim that addition of water was needed to reduce acidity of grape juices. However, there are better methods for the de-acidification of acid grape juice than addition of water (Eschenbruch 1974 and Sheat 1973).

New regulations introduced in April 1980 established that the amount of grape juice used in making table wine must be at least 80% by volume of the finished wine. In making a dessert wine the grape juice content must exceed 60%. Where a wine is labelled "premium" or "private", or carries the name of a particular grape variety (varieties) it must be made from at least 95% of grape juice, including 75% of juice derived from that particular variety (varieties) of grapes.

However, the new regulations did not appear to have made much impact in changing wine-making practices. As has been mentioned before, in 1980 the total wine production of 46.6 million litres came from only 30 million litres of grape juice. The results of laboratory analysis carried out by the Consumer Institute confirmed the statistical findings (Section 6.3).

3.2.6 - Stocks

Table A.4 shows the volume of wine in storage at the beginning and at the end of every season. In 1979 the stock level reached more than 55 million litres. This was equivalent to one and a quarter year's production. It is very difficult to ascertain the reason why statistical figures on stocks of wine did not reflect the increase in the annual differences between production and sales. According to statistical figures, production, sales and consumption of wine increased on average 12% per annum for the period 1960-1980, while stocks of wine increased only by 11% per annum over the same period (Table 3.1). Individual winemakers attributed the difference to spillages, samples, experiments and losses, but they refused to answer any detailed questions on this matter.

The determination of the stock to sales ratio is based on considerations about market requirements, storage capacity and maturation. Winemakers try to keep the stock to sales ratio at a minimum commensurate with maturation and market requirements, making provision for a poor crop or an increase in sales greater than expected.

Maturation was actively encouraged by government policy. The 1968 Budget proposed to adopt a standard basis of valuation for income tax purposes in respect of the maturation of wine.

3.3 - Trends in wine consumption and sales

Internal sales of wines equal total sales of local wines plus sales of imported wines minus exports sales. This section investigates the trends of these variables and the trends of consumption.

3.3.1 - Wine sales

Sales of wine have been increasing at a rate of 12% per annum during the period 1960-80 (Table 3.1). Sales of table wines increased at an average rate of 22% per annum and sales of dessert wines increased at an average rate of 6% per annum (Figure 3.4 and Table A.5).

Sales of New Zealand wines increased at a slower rate than production until the year 1973-74. During 1974-75 production declined by 25%. Total sales also experienced a decline but only of 10%. In 1974-75 the volume of wine sold was close to the volume of wine produced. From 1975 to 1980 wine sales and wine production had similar growth rates.

3.3.2 - Imports

Wines imports are shown in Table A.6 for the years 1963-64 to 1978-79. In 1963-64, the volume of dessert wines imported was higher than the volume of still table wines. In 1973-74 the main types of wines imported were wines under 25% proof (bottles), which are "table wines", and represented 50% of the total imports.

The total volume of imported wines has been gradually increasing over the years but their proportion in respect of total wine consumption has decreased. In 1979 the consumption of imported wine represented only 4% of the total wine consumption, whereas 15 years before the proportion was about 18%. It appears that government measures to restrict competition from overseas wines succeeded to the extent that consumption of local wines increased at the expense of consumption of imported wines.

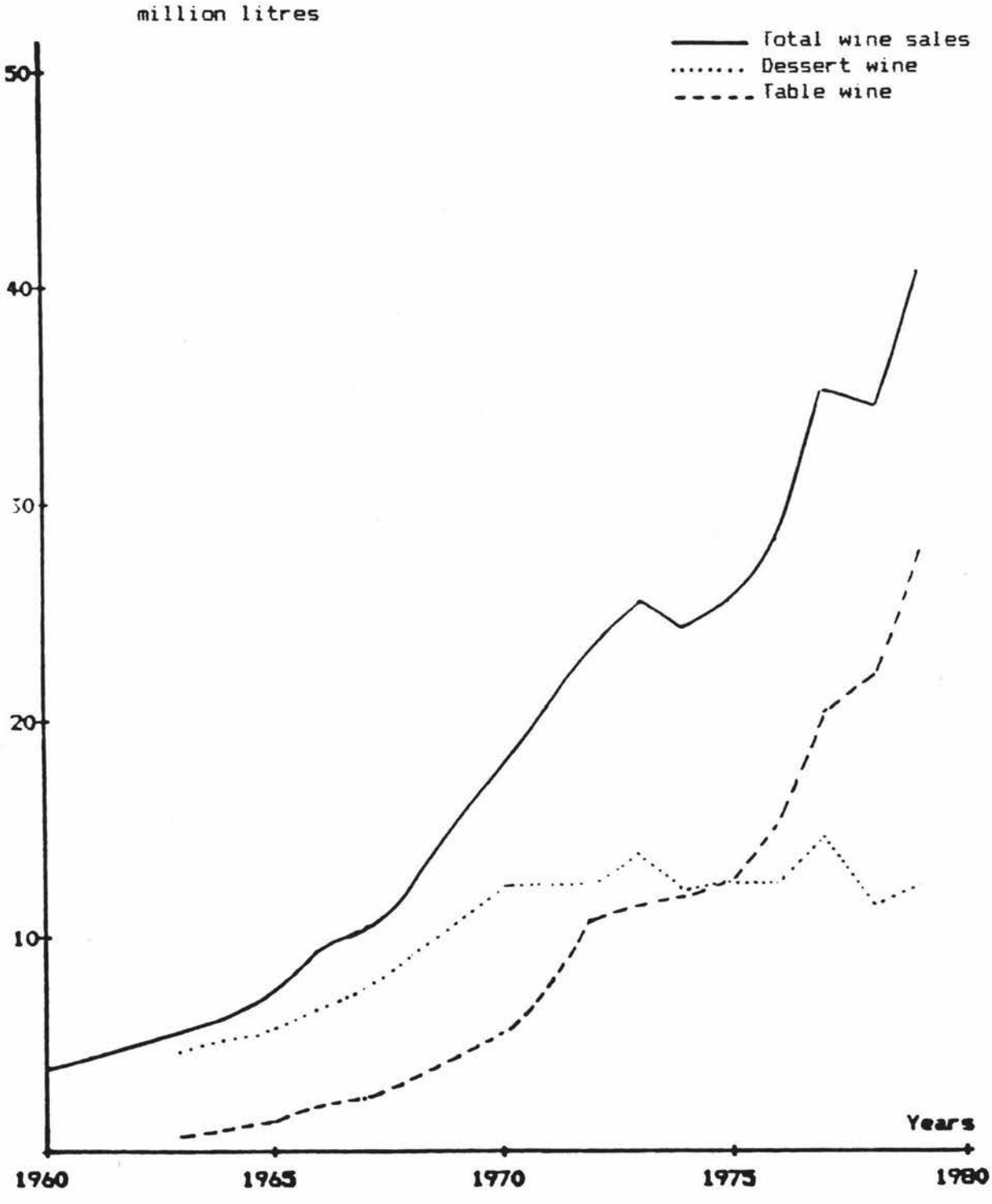


Figure 3.4 - Sales of wine - Table and dessert

Source: Monthly abstracts of statistics (Table A.5)
Unit : (000) tonnes
Years : 1960-1980

3.3.3 - Exports

Exports of New Zealand wines from 1966 to 1980 are shown in Table A.7. Wine exports do not exceed 1% of total sales. Efforts have been made to open export markets for New Zealand wines mainly in Canada, Hong Kong, Japan, the United States and the Pacific Islands. Efforts have also been made to improve wine quality for exports (Berrysmith 1975). The annual rate of increase in exports has been high, because the initial quantity was very small, but the total amount is still very low.

In 1973-74 the f.o.b. value in New Zealand dollars was $0.40 per litre, and in 1976-77 it was $1.09 per litre of wine exported, which is less than the price of wine ex-winery. In 1973 the price of wine ex-winery was $0.68 per 0.750 litres or $0.90 per litre, and in 1977 was $1.12 per 0.750 litres or $1.49 per litre (see Table 4.3). Total value of wine exports in 1980 was about $650,000.

A top industry executive asserted that without the government's tax incentive scheme it would be impossible for the wine industry to sell overseas (private communication). Even taking tax incentives into consideration it would appear that local sales are subsidizing the export market.

In 1978 table wines and "grape must" in fermentation represented 65.7% of exports which is a change in the initial trend of fortified wines dominating the volume of exports. The Wine Institute estimates that export of table wines is likely to continue with increasing emphasis on white wines.

3.3.4 - Wine consumption

Until the year 1973 the growth in wine consumption was 13% per annum against an increase of wine production of 16% per annum (Table 3.1). Therefore, the production of local wine was increasing by 3% more every year than the capacity of the market to absorb it, although it was partially compensated by the decrease in consumption of imported wines. This imbalance disappeared in 1974-75 when wine production declined by 25% (8 million litres). Consumption of fortified wines declined by 1.7 million litres for the same year (Figure 3.5).

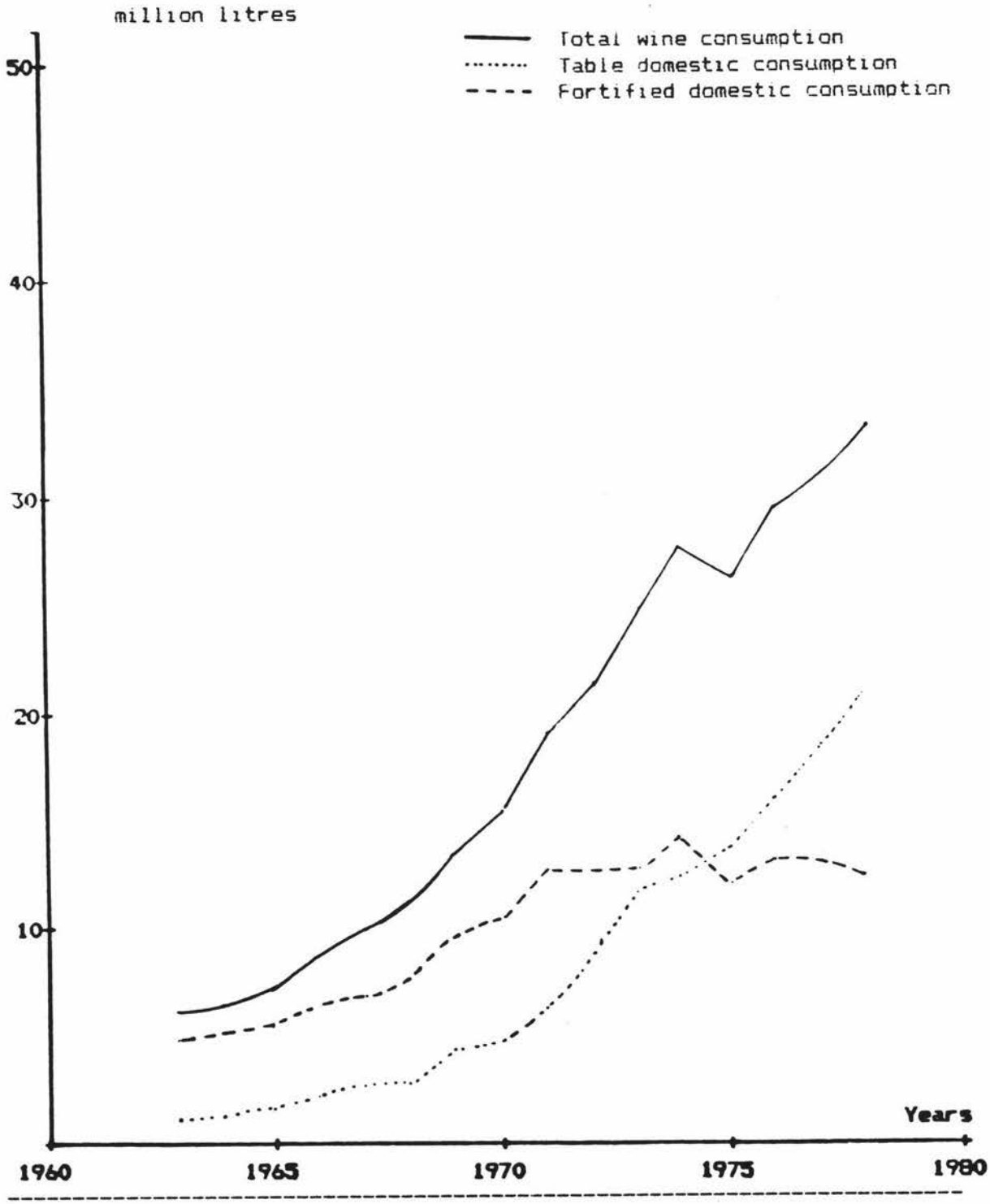


Figure 3.5 - Consumption of wine - Table and dessert

Source: Monthly abstract of statistics (Table A.8)
Unit: (000,000) litres
Years: 1960-1980

Consumption of wine per head of population in New Zealand gradually increased from 2.5 litres in 1963 to 11 litres in 1979 (Table A.8). This is low compared with other wine-producing countries with longer traditions of wine consumption (e.g., France and Italy have a per capita wine consumption of more than 100 litres), and also compared with the internal consumption of beer (129 litres per capita). The projected consumption per capita by the Wine Institute Industry Study is 16 litres in 1986. Although consumption per capita has increased fourfold in 15 years (1963 to 1979) it did not meet the expectations of winemakers (Australia and New Zealand Bank 1973).

Growth in consumption originated both from population increases and changes in consumer attitudes towards wine. These changes have also been stimulated by an active wine promotion programme and by society's acceptance of wine as a social drink.

3.4 - Summary

Wine consumption and wine production have been increasing at an average rate of 12% per annum over a twenty year period (1960 to 1980). During the early 1970's, supply of wine exceeded demand. Subsequently, market adjustments took place by way of reduction in the quantity supplied in 1974-75 and 1975.

The yearly production of wine depends on the amount of grapes available after harvesting, and on wine-making practices. In the past, addition of water and sugar has been a common practice. For many years only 50% of the total volume of wine produced was grape juice.

During the period under study (1960-80), a change in the pattern of production from dessert wines to table wines has occurred. Production of table wines increased by 21% per annum while that of dessert wine increased by only 6% per annum. Consequently, by 1979 production of table wine surpassed that of dessert wine by 20 million litres. These changes had followed the trend of increasing demand for table wines, but it has also been a deliberate goal of winemakers to produce the type of grapes which grow best under New Zealand climatic conditions.

onsumption of wine per capita increased fourfold in 15 years (1963 to 979) but still did not meet the expectations of people in the industry. onsumption was 11 litres per capita in 1979.

he proportion of consumption of imported wines to consumption of total ines has decreased over the years. In 1979 consumption of imported wines epresented only 4% of total wine consumption.

CHAPTER 4

PRODUCTION AND MARKETING SYSTEM

4.0 - Introduction

A marketing system comprises several levels of activity usually dedicated to the transformation of products, their packaging and distribution. Frequently there are several firms or units in each level which operate independently. However, free flow of the product from one level of activity to another can be affected by vertical integration. Blair (1972) used the term "vertical concentration" instead of the term traditionally used "vertical integration" because he refers to a structural state rather than to a process. He defined it as follows (Blair 1972:25): "Vertical concentration refers to operations by a company in 2 or more industries representing successive stages in the flow of materials or products from an earlier to a later stage of production or vice versa". Integration can move upstream into raw materials and downstream into transportation, wholesaling and retailing.

Concerns about the influence of vertical integration on market behaviour have revolved around the market power that firms operating in a vertically integrated system have, relative to firms operating in a single-stage market. At the growers' level there tends to be a large number of units with not much product differentiation. By comparison, the transformation stages of the system tend to have a smaller number of enterprises. Parts of the system which integrate vertically may hold more power than parts which remain independent. Through integration a firm can increase its market power by curtailing supplies, imposing price squeezes, preempting markets through ownership of important buyers, and by exercising control over consumer price. On the positive side vertical integration can create opportunities for attainment of efficiencies through a better flow of information reflecting consumer needs. Information about market requirements is important for decision making over volume supplied in the short-term and control over price.

As indicated in Chapter 1, control over price is one of the characteristics of monopoly. Firms which are operating under oligopolistic conditions can also exercise control over price and the price can be fixed at a higher level than that of a competitive industry (Section 1.3).

This chapter is aimed at investigating the several levels of activity involved in the making and distribution of wine in New Zealand with special emphasis on vertical integration. The analysis of the marketing system and industry structure provides plausible explanations for the maintenance of prices at times of oversupply.

4.1 - Model of the wine marketing system

The conceptual model of the wine marketing system can be represented by a diagram. Figure 4.1 shows the product flow through different levels of activity from grape growing to wine consumption as well as its shortcuts from one level to another.

4.1.1 - Grape growers

The proliferation of contract growers is a quite recent phenomenon within the system. In 1960 the proportion of grapes bought from contract growers was 5%, in 1975 it had risen to 35% and in 1980 it went up to 62%. There was an expansion of vineyard area and an increase in the total number of contract growers (from 161 in 1966 to 567 in 1980). It is also significant that the number of wine-making licences had dropped from 141 in 1973 to 99 in 1980. It is possible that some winemakers abandoned wine-making and changed to contract growing.

Prior to 1975 winemakers had commercial agreements with grape growers under medium term contracts (the average term was 5 years). Some contracts are still medium to long-term (from 5 to 15 years) but the price agreements are on a year to year basis. The formula used to determine grape prices is cost plus.

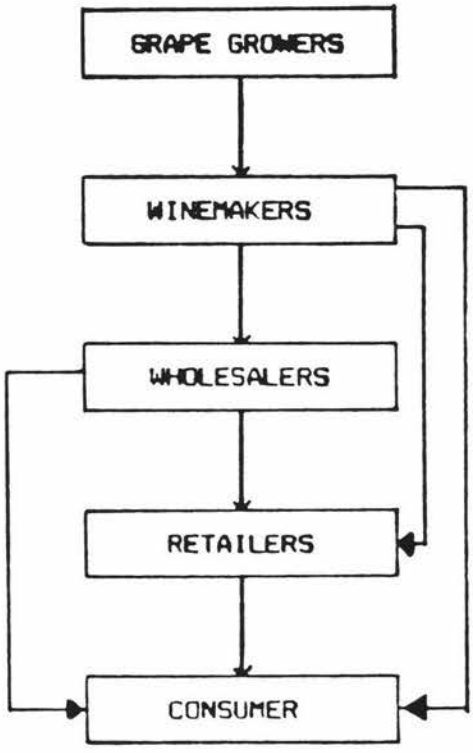


Figure 4.1 - Wine marketing system ----> Product flow

Table 4.1 - Grape prices

Wine Type	1975	1976	1977	1978	1979
Riesling Sylvaner	137	201	235	275	290
Pinot-Chardonnay	218	296	325	420	500
Cabernet Sauvignon	-	300	330	410	448
Palomino	136	180	206	245	268
Chasselas	122	198	206	240	260
Pinotage	-	-	285	325	360
Average price of vinifera varieties	153	235	264	319	354
Average price of all varieties					
- Ex-winemakers' vineyards	-	162	187	200	200
- Ex-contract growers	-	190	229	286	305
Difference	-	+28	+42	+86	+105

Source : Wine Institute of New Zealand, February 1979
Units : $ per metric tonne
Years : 1975-1979

Figures published by the Public Tariff Inquiry No. 199 of the Tariff and Development Board (NZ Dept. of Trade and Industry 1973) showed that average grape prices received by growers in 1970 was 20 cents per kilogram. Grape prices dropped to 19 cents per kilogram in 1971. It dropped even further to less than 14 cents per kilogram in the 1972 vintage (2,298 tonnes of grapes valued at $319,867 and 61 tonnes of grape juice valued at $8,428 were supplied to winemakers). The grape price was fixed at 14.5 cents per kilogram from 1973 to 1975. Prices fell at the time when wine was in oversupply (Figure 3.1 - Section 3.2.1) and winemakers introduced in their contracts with growers a penalty clause based on sugar content of grapes. This induced some growers to replace hybrids with vinifera varieties, the grapes of which were in greater demand. More recent figures provided by the Wine Institute show that from 1975 on shortages of vinifera grapes have forced prices up. The grape price was 19 cents per kilogram in 1976, 23 cents per kilogram the following year and 28.5 cents per kilogram in 1978. The average price of vinifera grapes was 32 cents per kilogram in 1978 and 35 cents per kilogram in 1979 (Table 4.1).

In 1981 one of the major companies in the wine-making industry, Penfolds Wines Ltd, offered contract growers a 40% bonus increase in price on top of its 12% yearly increase, and tried to encourage growers to sign 15 year contracts (Berryman 1981). The Wine Institute asked the government to intervene once more by curtailing the free movement of prices.

Contradictory statements about grape supply were made public in 1981 by individual winemakers and the Wine Institute. Some winemakers maintained that grape shortages led to the production of watered and flavoured wines, while the Wine Institute and some of its members argued that there was an oversupply of grapes (Berryman 1981).

The proliferation of number of growers and the increase in vineyard area under contract growers indicate that at present grape growing is an attractive use for land. Vineyard land was previously predominantly used for dairy farming but in the case of contract growers their land was predominantly used for annual crops such as maize, peas and other vegetables (WINZ, Feb. 1979).

The pricing criteria for grapes in 1979, currently under reassessment,

were based on the following:

- 9% return on the average value of all plant and machinery;
- 10% return on "low risk" investment, such as land, buildings and drainage;
- 14% return on "high risk" investment on non-saleable capital, (to allow for it to be written off over 10 to 15 years);
- a remuneration for the owner-manager.

In 1979, the average price per tonne of grapes was about $350 (Table 4.1). Taking into consideration that the average yield per hectare in New Zealand is 16.5 tonnes, gross return per hectare was $5,775. The net return per hectare would depend on physical and financial requirements of vineyards. Vineyard establishment costs in 1979 were about $6,000 per hectare. Operational costs per hectare, including labour, averaged $1,880. The above information has been taken from the Industry Study and Development Plan 1978 by the Wine Institute (WINZ, Feb. 1979).

Taking into consideration that in 1978 "the average sale price for horticultural land in New Zealand was $8,789 a hectare" (WINZ, Feb. 1979:27), an approximate figure for the net return per hectare can be estimated. Deducting operational and capital costs from the gross return per hectare, a net return per hectare is obtained. Rates of return as established in the pricing formula are:

	NZ$	
Operational costs per hectare	1,880	
10% return on invested capital per hectare	879	
9% return on plant and machinery "	300	(approx.)
14% Return on non-saleable capital " (including establishment costs)	700	
Total cost per hectare	3,759	
Gross return per hectare	5,775	
Residual	2,016	(approx.)

Winemakers claimed that the cost of grapes from their own vineyards was 10 cents per kilogram cheaper than the price paid to contract growers. Taking into account the average yield per hectare of 16.5 tonnes, this would mean a net gain of $1,650 per hectare, which is a more moderate estimate than the residual calculated above through an approximation of operational and establishment costs.

4.1.2 - Winemakers ownership patterns

The number of wine-making licences issued for the year 1973-74 was 141, of these 110 were in operation during 1975-76 and only 99 in 1977-78. In the year 1973-74 there were three licence holders processing grapes from their own vineyards on an area of 410 hectares or more. Four licence holders were processing grapes from vineyards of between 41 to 410 hectares, and 24 winemakers owned vineyards of between 4.1 and 41 hectares. The remaining 78% of licences were for vineyards of less than 4.1 hectares (Corban 1974).

There are 5 companies in the industry which the Wine Institute Study referred to as major winemakers whose combined production was 62.5% of the total industry output in 1978. These major wine-making companies are not solely owned by individual winemakers; they are usually associated with breweries, large distribution companies or companies with overseas connections or affiliations.

Winemakers with a production level between 1,000 and 10,000 hectolitres of wine are referred to by the Wine Institute as medium producers, and they represent about 10% of the total winemakers' licences. Winemakers with an output level of less than 1,000 hectolitres of wine represent about 90% of the total number of winemakers' licences.

Structural changes started taking place in the early 1940's when the breweries became interested in the wine industry. The analysis of the ownership patterns is extremely intricate because of the entanglement of interconnections with breweries and merchants.

The Averill brothers were the first winemakers to sign a long-term contract with a distribution company supplying Dominion Breweries with their total output. In 1948 their business was bought by Penfolds of Australia. Penfolds Wines (NZ) Ltd, was 56% owned by Penfolds Australia and the rest by wholesale wine and spirit merchants. In 1981 Penfolds' major shareholder and managing director was Frank Yukich, who was also involved in the deal between Montana and the international giant "Seagram". In November 1981, Lion Breweries bought new shares issued by Penfolds for $2.5 million which represented about a 35% ownership of Penfolds Wines. Lion

Breweries made the commitment to buy 51% of the company by 1984 and 75% by 1986 (See Appendix C for details about present shareholders, company directors and a list of subsidiary companies - See also Figure 4.2).

Another of the five major winemakers, McWilliams' Wines, was registered in New Zealand in 1944 with most of the initial share held in Australia by McWilliams' Pty Ltd of Sydney. In 1974 McWilliams took over McDonald's Wines. In 1981 the Australian company had only 34% of the total capital of McWilliams' Wines Ltd, 29% owned by Ballins Industries Ltd, 25.5% by New Zealand Breweries Ltd (Section 4.1.3), 10% by Dominion Breweries Ltd, and 2% by Campbell and Ehrenfried Co (Appendix C).

Corbans' Wines, initially entirely owned by the Corbans family, followed similar developments. In 1965 Corbans made an agreement with Harveys of Bristol. In 1972 Corbans Wines Ltd was 77.5% owned by A.A. Corbans and Son Ltd, which in turn was owned by Corbans' Holdings Ltd, 75% by the Corbans family and 25% by Rothmans' Holdings Ltd. By 1981 Corbans Wines Ltd was entirely owned by Rothmans' Industries Ltd. In November 1981 Rothmans' Industries Ltd committed $6.2 million for a 24.9% shareholding in Ballins Industries Ltd.

A new company was formed in New Zealand by public subscription in 1972. This was Cook's New Zealand Wine Co Ltd. In 1973 Associated Group Holdings Ltd (AGH) bought 50% of the shares. In 1977 AGH was taken over by Marac Holdings Ltd, but at a later stage Marac was in financial difficulties and had to sell its shares in Cook's New Zealand Wine Co Ltd. Rothmans and Penfolds made an offer but the Examiner of Commercial Practices intervened as the transfer was not considered to be in the public interest. Transvision acquired 30% of the available shares and the other 70% was offered to the public. Transvision shares were acquired by CBA Finance Holdings Ltd. When CBA wanted to sell its shares in 1981 McWilliams' Wines Ltd made an offer but this ownership transfer was again stopped by the Examiner. These shares, which represented 25% ownership of Cooks Wines were finally acquired by Hawkes Bay Farmers. Brierley Investments had a 7% shareholding and had a financial interest in Hawkes Bay Farmers which represented an interest in Cooks New Zealand Wine Co Ltd of about 11%, Brierley also had connections with Australian companies (private communication).

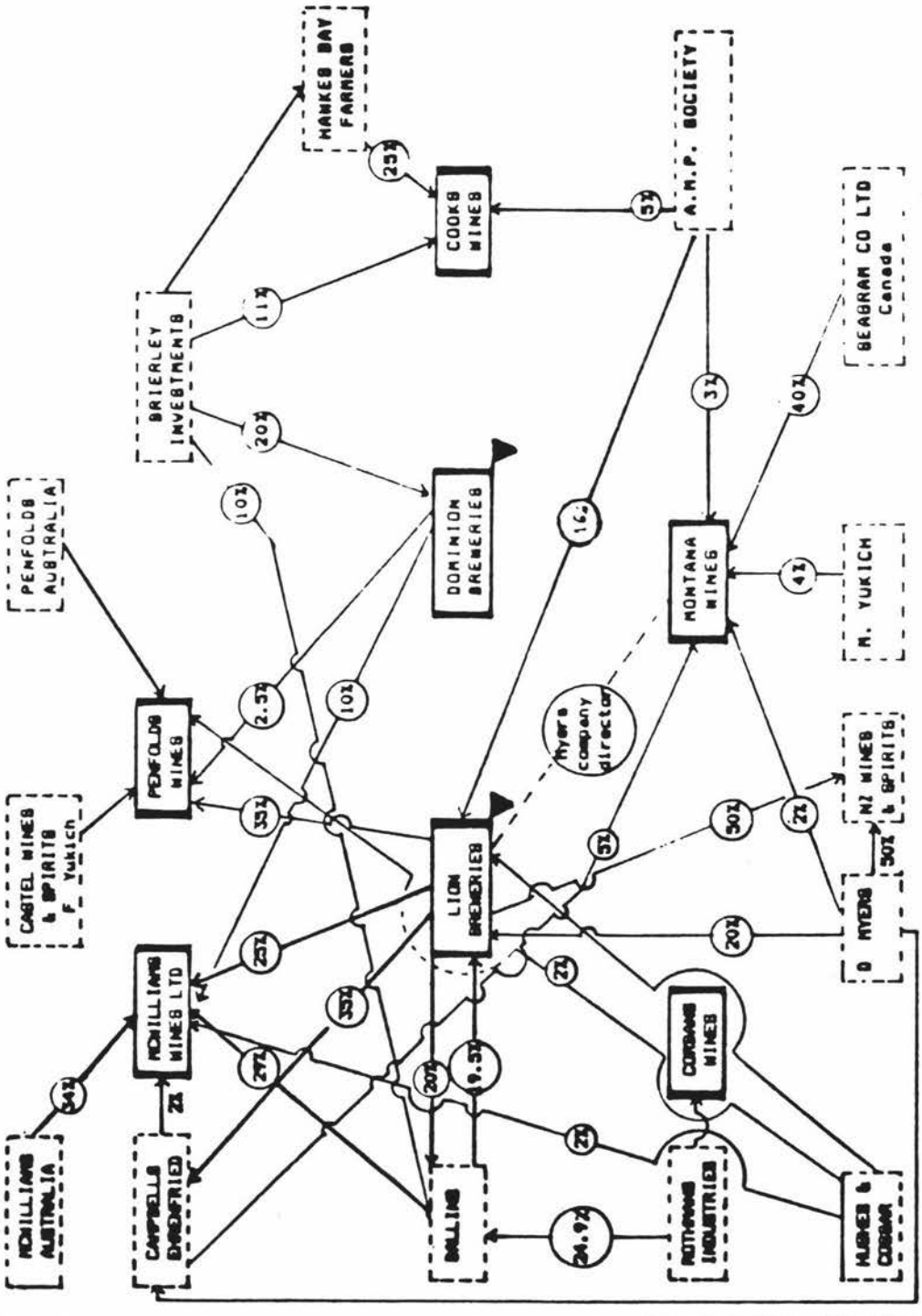


Figure 4.2 - Ownership of the wine industry
Source : District Registrar of companies
Year : 1981
Legend : % indicates % of shareholding

Breweries
Winemakers
Others

The largest company in the industry at the present time is Montana Wines Ltd. In 1964 the formation of Montana Holdings Ltd took place. This group was later joined by the liquor wholesaling firm, Campbell and Ehrenfried Ltd and a prominent Auckland financier, the late Rolf Porter.

In 1981 Montana Wines Ltd was 40% owned by Seagram Co. Ltd, Canada (a list of other major shareholders is presented in Appendix C). Companies comprising the Montana group were: Montana Wines Ltd, Marlborough Wines, Vineyards & Estates Ltd. and Ormond Wines. Montana Wines was also directly involved in the marketing and distribution of wine through retail wine shops and by way of a franchising arrangement with the new "Hadleighs" organization. Marketing was conducted by the company's own sales division in conjunction with its principal distributor, New Zealand Wine and Spirits Co. Ltd, 50% owned by D.A. Myers, who was a company director of Montana Wines Ltd and who had acquired 20% of Lion Breweries in 1981 (Appendix C and Figure 4.2).

4.1.3 - Wholesalers

There are several wholesealer associations which comprise a number of companies operating as distributors of wine.

The New Zealand Wholesale Wine and Spirit Merchants' Federation had 173 members in 1979. They were engaged in wholesale trading of domestically produced wines and fermented or spirituous alcoholic beverages, and in importing wines and spirits. The members distribute liquor throughout New Zealand to all types of licensed retail outlets. They also sell directly to the public in minimum quantities of eight litres. Some members hold resellers' licences as well, which allow them to sell single bottles at resellers' prices.

In the Industries Development Commission (IDC) report (NZ Dept. of Trade and Industry 1980:26) it was stated that "the Federation had a substantial interest in the importing, distributing and retailing of local and imported wines. Some members were investors in the wine industry".

The Brewers' Association of New Zealand comprised three member companies in 1979. They owned and operated twelve breweries throughout the country.

They also owned and operated, either by direct ownership or by subsidiary company, 633 licensed wholesale, hotel and tavern outlets, representing 50.2% of the total liquor licences. The IDC report (NZ Dept. of Trade and Industry 1980:30) stated that "Members of the Brewers' Association had a 34.99% equity ownership in the capital of one of the major national wine producers and lesser interest in the capital of other wine companies. The incentive of marketing commissions relating to equity interest promoted basic marketing of New Zealand wines in those wholesale and retail outlets in which brewery companies had some ownership of share capital. The companies were therefore concerned in promoting the product which gave them the greatest yield in terms of profitability .....".

As the breweries play an important role in the ownership of the wine industry, either directly or indirectly through their involvement in the distribution channels for wine and beer, it is relevant to this study to pay some attention to their ownership patterns as well.

New Zealand Breweries Ltd was incorporated with Lion Breweries Ltd in 1977 and had a total of one thousand shares, one owned by T.G. McCarthy and 999 owned by Lion Breweries Ltd. A list of Lion Breweries subsidiaries and associate companies is presented in Appendix C. A shareholder of Lion Breweries with more than one million shares, was Ballins Industries Ltd. Lion Breweries' wholesale operations in wine and spirits involved a turnover of more than one hundred million dollars in 1980.

In 1981 Leopard Breweries was 50% owned by Lion Breweries Ltd, as shown in Appendix C, and the other 50% was jointly owned by Malayan Breweries Ltd and Fraser & Neave Ltd, both of Singapore.

The registrar of companies showed that in 1981 the shareholding of Waikato Breweries was held by two companies, namely Lion Breweries Ltd and T.G. McCarthy Ltd, and was therefore totally incorporated in New Zealand Breweries Ltd.

A large number of wine and spirits distributors were wholly owned by the Ballins Group (including "Hamilton Wines & Spirits", "Macindoc Wines & Spirits Ltd", "Murphys' Wines & Spirits Ltd" and "Simons Wines & Spirits Ltd"). Other distributors were majority owned by Ballins Group together

with Fletcher Humphries (i.e., "Buckhams Wines & Spirits Ltd"). Canterbury Wines & Spirits was majority owned by Ballins together with Lion Breweries. Other significant connections of the Ballins Group were the 50% owned associated companies including Allied Liquor Merchants, Associated Taverns Ltd, Fletcher Humphries, International Bottling Co., McWilliams Industries Ltd, and The Rochdale Cider Co Ltd. Information related to this section has been gathered through several district registrars of companies.

All this illustrates the network that exists in the wine marketing system which leaves the control of the distribution channels in a few hands. The two main breweries play an important role in the distribution of wine and they can exercise a great deal of power. Lucas (1977:5) in his report on the influence of the distribution mechanism pointed out that, "it would be quite easy for NZB and DB to deny any winemaker access to about 85% of the wine market - perhaps more". Another way to use their influence would be through the imposition of penalties to the licensee who sells more than a fixed percentage of products from a source outside the group. Lucas (1977:4) also stated that "a 1977 tenancy agreement allows the imposition of heavy penalties (in the form of loss of rent rebate) on a licensee who buys too much outside the 'family'".

It has been suggested (private communication) that unfair tactics have already been used to penalise independent winemakers who fail to conform with the established system. A particular example of this occurred when a winemaker who was not directly associated with the breweries decided to establish a different set of prices for the South Island, cost plus transport instead of the flat rate imposed at that time. The result was that no wine was ordered from this particular company by the wine distributors of the South Island, until the company stepped into line again.

Lucas (1977:4) stated that "a monopolist system of distribution cannot be good for the wine industry or the consumer's pocket". The IDC report (NZ Dept of Trade and Industry 1980:68) described the distribution system as a "select group of licence holders - manufacturers, merchants and resellers - a highly cartelized group characterized by their oligopolistic influence in the market".

4.1.4 - Retailers

The wine resellers' licence was introduced in 1948. This licence was limited to the sale of New Zealand wine only. The New Zealand Wine Resellers' Association in its submission to the IDC stated that their share of the market had declined from 90% in 1964 to 24% in 1979. The 1978 Wine Institute Study confirmed these figures as it stated that 75% of New Zealand wine was sold by outlets with competing beverages. During this period resellers' outlets had increased from about 250 to 390 (WINZ, Feb. 1979).

Resellers claimed in their submission to the IDC that the major competition came from wine and spirit merchants whose tactics were to close direct channels of distribution from winemakers to resellers. At that time there were eleven different types of wine retail licences:

Hotel and Tavern Premises Licences
Tourist Hotel Licences
Wholesale Wine and Spirit Licences
Restaurant Licences
New Zealand Wine Resellers' Licences
New Zealand Winemakers' Licences
Wine Bar Licences
Chartered Clubs
District Licensing Trusts
Local Licensing Trusts
Suburban Licensing Trusts

The principles on which the licensing system rests are that no liquor can be sold without a licence and that the number of licences should be limited. Restrictive licensing has to be understood in its traditional context based on the interests of the liquor trade and on the prohibition forces and their influence on legislation during the last century (Bollinger 1959).

In 1973, Mr R.I. Peace, the president of the Resellers' Association, in a submission made on behalf of the Association to the Royal Commission of that year, expressed his concern about unfair competition from

wholesalers who also acted as retailers (Lucas 1977:14): "due to takeovers and amalgamations there are numerous examples where ultimate control of wine reselling licences is being vested in these (wholesaling) groups .... some of which are ultimately controlled by larger interests, in some cases traceable back to breweries which in turn have interests in the larger winemakers, there must be at least a temptation to push the product of the 'family' ...., the holding of two different types of licences on the same premises should be prohibited".

Mr G. Mazuran, President of the Viticultural Association, also made submissions to the Royal Commission. He noted that (Lucas 1977:15): "those winemakers which were overseas-owned, or controlled by the breweries, had at their disposal almost all the hotels, taverns, wholesale wine and spirits merchants and resellers as avenues of distribution for their wine". He went on to say that his association was very much concerned with the present monopolistic trend as far as the sale and distribution of New Zealand wines were concerned (Lucas 1977:15): "the existing outlets are very rapidly falling into the hands of the few, which are in turn being monopolized by the breweries and the wholesale merchants. This trend, if not stopped, will soon deprive all those winemakers who are not affiliated to the liquor industry of the right of access to the consuming public and .... will bring financial disaster to those winemakers!".

The ownership of the liquor outlets in New Zealand in 1981 is shown in Table 4.2 which highlights the concentration of retail outlets in the hands of the breweries and wine and spirits merchants who in turn are associated with breweries. Some of the resellers' licences described as being in private ownership are in fact issued to wholesalers under brewery control.

Alternative retail outlets have been proposed to make the distribution system more competitive. Submissions were presented to the 1973 Royal Commission supporting the selling of wine in supermarkets. However, this view has never been favoured by people in the trade. The New Zealand Retailers' Federation claimed in its 1979 submission that the major supermarket chains could resell the product with a minimum 12.5% margin from the price ex-winery. This would represent an extraordinary reduction

Table 4.2 - Ownership of the liquor outlets in New Zealand

OWNED BY	DOMINION BREWERIES	NZ WINE & SPIRITS	LION BREWERIES	TASMAN WINES & SPIRITS	BALLINS	QUILL & MURPHREYS	MATHAN	HUGHES & COSSAR	WILSON NEILL	LEOPARDS	TRUSTS	OTHERS	TOTAL
	20% BRIERLEY	50% Myers 50% LION		33% NZ WINE & SPIRITS	20% LION BREWERIES & 10% BRIERLEY	38% BALLINS				50% LION BREWERIES & 50% MALAYAN			
Hotels	280	-	240	-	28	-	13	-	2	12	90	476	1141
Cellers &	-	-	38	-	-		2	-	2	2	20	-	64
Wine Shops	-	-	-	-	5	-	14	-	8	-	18	356 +	402
Merchants	25	27	-	22	33	6	2 =	6	8	2	8	31	175

Source : The NZ Wineglass (1981:2)
Year : May 1981

(*) Hotel licence with merchant prices. Includes beer and imports
(=) 50% Allied Liquor Merchants
(+) Major owners not shown above: Montana (27%), Balic Estate (14%) and Penfolds (9%)

in the current price to the consumer (Section 6.5). Reduction of price and greater exposure of the product would result in an increase in demand. In spite of this, some winemakers do not support introduction of wine in supermarkets, as they have a vested interest in some of the links in the distribution chain, either acting as wholesalers or as retailers. In 1980 a supermarket in South Auckland had a wine selling licence. It was selling wine at 50 cents per bottle less than the recommended resale price and $1 less than wine shops. The manager of this supermarket maintained that he could sell the same wine $1 cheaper per bottle than the recommended retail price if he was able to use his own distribution system.

Wholesalers and retailers argued that supermarkets would not carry as many brands and variety of wines. They also argued that winemakers do not know the market situation as well as they do. Allied Liquor Merchants Ltd in its submission to the IDC in 1979 stated that they carried 35 wine producers stocks which involved 475 varieties. They had an average stock holding of $500,000 and a turnover of 157,000 litres of wine per month involving purchases valued at $330,000.

Also in their submissions to the government the Brewers Association attempted to give an explanation for the high margins. They stated that New Zealand producers and distributors do not have the advantages of economies of large scale and they are burdened with high labour costs and transport. However, labour costs and transport costs were not specified and they did not disclose a breakdown of costs which could justify their high distribution margins.

4.2 - Vertical Integration

A vertically integrated firm performs more than one production process from raw materials to finished products or goods. Integration can move upstream into raw materials and downstream into transportation, wholesaling and retailing.

The wine industry in New Zealand is highly integrated. Most of the winemakers are involved in all levels of activity from grape growing to wine selling. Most winemakers have their own vineyards (backward

integration) and many of them have their own resellers' licences (forward integration).

Due to the existing vertical integration in the industry, manufacturers buy only a percentage of the total raw material - grapes - that they use for the making of wine. In 1960-61 the proportion of grapes bought from growers was 5%, in 1974-75 this was 35% and in 1980 this went up to 62%. These figures show that the process of upstream integration is reversing. It also appears that the integration is going downstream into wholesaling and retailing (Section 4.1). However, the winemakers complained that they were heavily dependent on grapes from other sources and they asked for government help by way of cash grants, low interest loans over long periods or extended overdraft facilities on favourable terms in order to reverse this trend (WINZ, Feb. 1979).

Vertical integration in the wine production and marketing system could produce cost advantages to the parts of the system which integrate. The average prices per tonne of grapes in 1978 were: $286 ex-contract growers and $200 ex-winemakers' vineyards, the difference being $86 per tonne (WINZ, Feb. 1979). Therefore, the cost advantage to the winemakers, who grew their own grapes, was 8.6 cents per kilogram.

Revenue distribution from wine sales, as shown in Table 4.3, indicates a possible source of cost advantages that winemakers could gain by pursuing downstream integration. The cost of wine accounts for 18% of the price consumers pay. The remaining 82% goes to bottlers' suppliers, government and intermediaries in the distribution system. Under existing discount structures a wholesaler/retailer could enjoy a mark-up of 58% if he is a wine company shareholder. Lucas (1977:28) stated that: "merchants would sometimes receive a 15% discount for what is little more than a book entry .... expect a further 5% discount for shareholder status".

One of the main reasons for firms to pursue vertical integration is the market power they gain relative to the firms operating independently in a single-stage market. Through vertical integration upstream a firm is in a better position to exercise some control over the price of the primary products it buys. Through downstream integration by ownership of

Table 4.3 - Price movements for 1973, 1976 and anticipated 1977
(for table wine per "model" bottle)

	Vintage 1973	Vintage 1976 *	Vintage 1977 x	% Movement 1973 - 77
Wine ex-winery	0.27	0.38	0.38	41
Bottle purchases	0.09	0.17	0.19	111
Corks and seals	0.04	0.08	0.11	175
Packaging	0.03	0.05	0.06	100
	0.43	0.68	0.74	72
Selling and overhead	0.22	0.29	0.06	45
Freight	0.03	0.05	0.06	65
Total ex-winery	0.68	1.02	1.12	65
Merchants mark-up	0.17	0.26	0.28	65
	0.85	1.28	1.40	65
Sales tax 20%	0.17	0.26	0.28	65
	1.02	1.54	1.68	65
Retail + 40%	0.41	0.62	0.67	65
	1.43	2.16	2.35	65

Source : (Lucas 1977:41)
Year : 1977

(*) November
(x) June 1977 - estimate

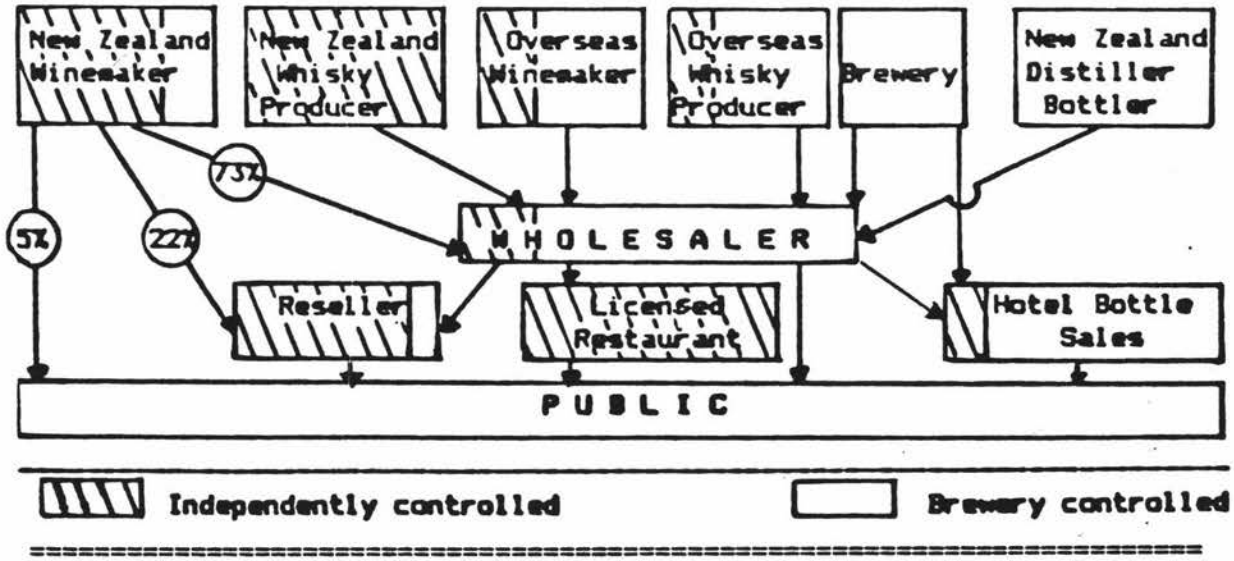


Figure 4.3 - The existing liquor distribution mechanism by sales volume
Source : (Lucas 1977:12)

important wholesale and retail outlets a firm is in a more favourable position to secure access to the consuming public.

In the existing liquor distribution system there are three main channels of operation; direct sales ex-winery which in 1977 accounted for 5% of the total volume sales, the specialist wine retailer (referred to as a "reseller"), and finally the wholesale distributors who in turn warehouse the wine, redistribute it to resellers and also sell directly to the public (WINZ, Feb. 1979) (Figure 4.3).

4.3 - Summary

This chapter has presented detailed material on the production and marketing system of wine from grape growing through wine-making and distribution to the consumer. Special emphasis has been placed on researching the ownership of the wine industry and on establishing some ownership patterns. Evidence has been presented of the affiliations and connections that some winemakers have with breweries and merchants.

Evidence has also been given of the existence of vertical integration within the system and of the power which it confers to parts of the system which are integrated. It appears that upstream integration is decreasing as the percentage of grapes grown by independent growers has nearly doubled in five years (1975 to 1980). On the other hand some winemakers tended to secure their access to the consuming public by acquiring their own retail outlets and/or shares in distribution companies. Vertical integration by distributors upstream had also occurred at the intermediate levels of distribution by acquisition of shares in wine-making companies. The parts of the system which are vertically integrated have gained a greater control of the market.

CHAPTER 5

CONCENTRATION IN PRODUCTION

5.0 - Introduction

The purpose of this chapter is to investigate the degree of concentration in the wine-making industry. Concentration at the production level provides an important indicator of oligopoly, but it is not always an accurate reflection of the actual market power of the largest firms in the wine industry. Their market power comes both from their market share at the production stage and from their connections in the distribution system, as established in the previous chapter.

Several measurements of concentration are discussed in this chapter. An approximation of the Herfindahl Index and the concentration ratio for the wine industry have been calculated based on the gross level of output.

5.1 - Theoretical approach to the concept of concentration

Concentration exists in a market when a small number of firms have a large proportion of market share. It can be defined as the degree of market power exercised by the few largest enterprises within an industry.

Concentration is one of the most important elements of market structure which influences firms' behaviour and determines industry's performance. Caves (1967:16) stated that concentration is one element of market structure which may negatively affect an industry's performance, "highly concentrated industries are likely to perform poorly because they allocate resources inefficiently". Bain (1968:439) also stated that "high seller concentration within industries should be associated with substantial excesses of selling price over long run average (and marginal) costs".

Ellis (1976:5), in his study of industrial concentration in New Zealand industries stated that "it is generally accepted that the greater the concentration in an industry, the greater is the chance that competition among sellers is lower than would be expected in less concentrated industries". In highly concentrated industries producers can reduce output and

maintain prices. This would allow producers to stay in business even if they operate inefficiently. Therefore, the important implications of concentration are its effects on resource allocation and consumer welfare.

5.2 - Measurements of concentration

Bain (1968) considered that if four sellers supply more than half of an industry's output, or eight sellers more than two thirds, concentration exists. He also stated that if four firms control 65% to 75% of the output the industry can be classified as highly concentrated.

Concentration can be determined in a variety of ways, but the measures most commonly used are the "concentration ratio" and the "Herfindahl Index".

The concentration ratio is the market share controlled by the largest few enterprises in the industry.

The Herfindahl index is computed by the formulation:

$$H = \Sigma \ S_i^2 \quad (S_i \text{ is the market share of firm 'i'})$$

The minimum value of H is 1/n when there are 'n' firms of equal size. The maximum value of H is 1 and indicates monopoly. The Herfindahl Index includes the market share of all firms in the industry.

Other ways to measure concentration are by use of a Lorenz curve, which measures the cumulative percentage of income or output in function of the cumulative percentage of firms, or by Gini's Index which is a function of the area between the Lorenz curve and the diagonal line. The difference between the concentration ratio and the Lorenz curve is that the first measures concentration by the cumulative number of firms and the second measures it by the cumulative percentage of firms.

There has been much discussion regarding the validity of these indices. Adelman (1951) pointed out that the degree of concentration measured on percentages has very little meaning, because an industry of a thousand firms, each one with 0.1% of the total output, would not show less

concentration than one containing two firms each with 50% of the total. Despite criticisms, concentration indices are still widely used and considered to be relevant, because concentration increases with a decrease in the number of firms.

The Herfindahl Index is a function of the number of firms in an industry and it has been considered a good indicator of monopoly power. However, it could also be misleading in that as more firms enter the industry the index decreases, even though a proliferation of small firms may do little to diminish the market power of dominant firms.

When data is not available for every single firm in the industry under investigation direct application of the Herfindahl Index formula would be prevented. In this situation an approximation to Herfindahl Index can be calculated by grouping firms of similar size.

Herfindahl Index is computed by the formula:

$$H_i = \sum_{k=1}^{n} \left(\frac{x_{ik}}{\sum x_{ik}}\right)^2 \qquad \text{(I)}$$

where x_{ik} is the value of the relevant variable for the kth firm of industry 'i'.

The equation for the approximation to the Herfindahl Index is the following:

$$H_i^* = \frac{1}{\sum_j \ell_{ij}^2} \sum_j \left(\frac{\ell_{ij}}{n_{ij}}\right)^2 n_{ij} \qquad \text{(II)}$$

where H_i^* is the approximation to the Herfindahl index

ℓ_{ij} is the value of relevant variable of grouping 'j' in industry 'i'

n_{ij} is the number of firms size 'j' in industry 'i'

It can be shown that the approximation of the Herfindahl Index, depending on the number of firms, will have a value either equal to or lower than the true index value (Appendix D).

5.3 - Concentration in New Zealand Industries

The New Zealand Institute of Economic Research published a research paper on industrial concentration. The research was carried out by Ellis (1976) who examined the structure of 92 New Zealand manufacturing industries and described the pattern of ownership in each industry. He estimated the employment concentration ratios of the three largest enterprises of each industry. In some cases the gross output variable was also used. A concentration ratio from 66% to 100% was considered to be "high", from 34% to 66% to be "medium" and from 0% to 33% "low".

Ellis (1976) concluded that 29 industries accounting for 13% of the total manufacturing employment were highly concentrated. Thirty six industries accounting for 33% of total manufacturing employment were moderately concentrated. The final 37 industries accounting for 54% of total employment had low levels of concentration.

In the wine industry Ellis (1976) found that the largest 6 companies had more than 70% of total employment. The concentration ratio based on employment for the three largest firms was 39.1%. The concentration ratio based on gross output was not available.

Ellis (1976:25) concluded that: "overall there appear to be three main reasons for the high degree of concentration in the New Zealand industry: first, the limited size of the market and the subsequent fewness of enterprises in some industries, second, the advantage of economies of large scale and high capital requirements, and third, state regulations, specially the protection of domestic industry".

Birks (1981) investigated New Zealand industry structure in relation to attainment of economies of scale. Herfindahl Indices were obtained for all manufacturing industries. Birks (1981:26) concluded that in New Zealand industries "economies of scale are not the severe constraint they are sometimes considered to be". He also concluded that market dominance by a few enterprises was probably based on factors other than economies arising from the size of plant.

Therefore, if "economies of scale" are not the main reason for the high degree of concentration in New Zealand industry, then it is likely, as concluded by Ellis (1976), that high concentration is caused by the limited size of the market and/or government policies for protection of domestic industries.

5.4 - Concentration ratios in the wine industry

For the purpose of measuring the concentration ratio of production empirical evidence has been gathered using two methods. One uses aggregated industry data obtained from several statistical sources and the other direct information from individual firms. A survey was conducted in 1973 using a sample of 72 wineries. Output data from the five largest firms of the industry is shown in Table 5.1.

Table 5.1 and the concentration curve in Figure 5.1, show that the wine industry was highly concentrated. Four firms controlled 71% of the market among more than one hundred other small manufacturers.

The approximation of the Herfindahl Index for the wine industry over the same period of time has been calculated on the basis of three groups, and equals 0.20373 (Table 5.2). This value is higher than those of other highly concentrated manufacturing industries like "Manufacture of miscellaneous products of petroleum and coal" (0.1115), "Manufacture of glass and glass products" (0.14476), "Iron and steel basic industries" (0.16785) and "Non-ferrous basic industries" (0.16976). Only "Tobacco manufacturers" (0.37539), "Petroleum products" (0.31927) and "Pottery" (0.34701) displayed higher values of the approximation of Herfindahl Index. The figures in brackets are the approximation of Herfindahl Indices calculated by Birks (1981).

The Wine Institute on its Industry Study (WINZ, Feb. 1979) confirmed the concentration of manufacturing by stating that 5 firms in the industry controlled 68% of the total output.

In order to calculate up-to-date concentration ratios for the wine-making industry, another survey was conducted by the researcher in 1981, but it was unsuccessful in obtaining data for all of the large and medium size

Table 5.1 - Concentration of industry's output

Firm	Output (000) litres	% of Output	Concentration ratio
1st largest	6819	29.18	0.29
2nd largest	4091	17.50	0.46
3rd largest	3409	14.58	0.61
4th largest	2273	9.72	0.71
5th largest	909	3.89	0.75
Total	23366	100.00	-

Source : Private communication from winemakers - 1973 Survey

Unit : (000) litres
Year : 1970-71

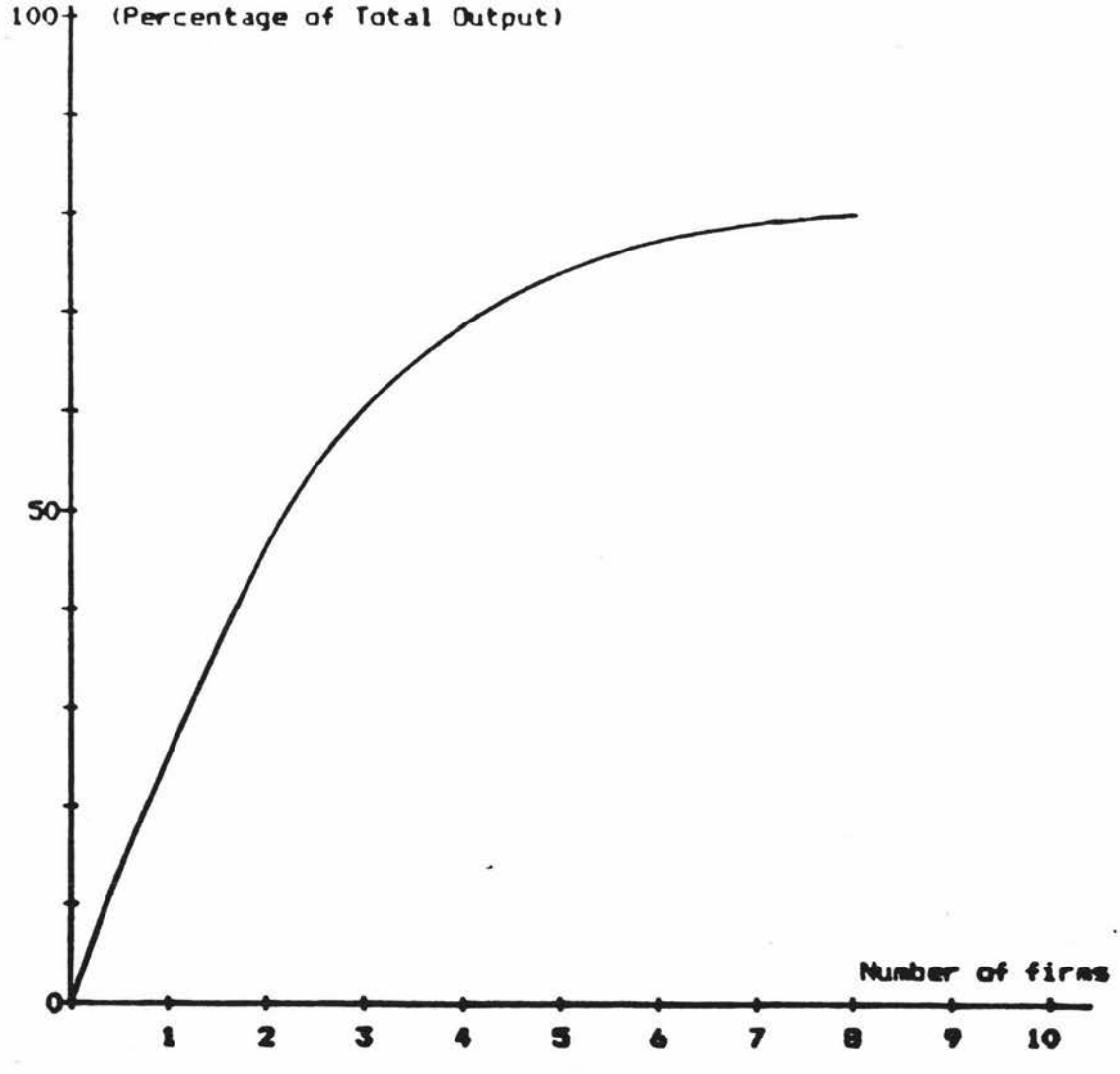


Figure 5.1 - Concentration curve
Source : Private communication
Year : 1970-1971

Table 5.2 - Approximation to Herfindahl Index

	(000 litres)	(No. establishments)
1st group - large size	17,501	5
2nd group - medium size	5,191	52
3rd group - wineries of less than 227 Hl	674	73
Total output	23,366	130

H = 0.20373

Source: Private communication (1973 survey) and calculated from Monthly Abstract of Statistics data
Unit : (000) litres
Year : 1970-71

Table 5.3 - Market share

	Market Share in 1981	Cumulative %
1st largest firm	27% to 30%	30%
2nd largest firm	14% to 15%	45%
3rd largest firm	11% to 12%	57%
4th largest firm	10% to 11%	68%
5th largest firm	9% to 10%	78%
6th largest firm	7% to 9%	87%

Source : Private communication

Year : 1981

firms in the industry, as some winemakers refused to provide any information. However, from several other sources (private communication) it was possible to obtain an estimate of the market share of the five largest firms (Table 5.3).

Comparing the cumulative percentages in Table 5.2 with those percentages in 1971 it can be seen that the distribution of the market share has remained quite stable. There has been a slight decrease in the market share of the second firm, which was confirmed by one of the firm's managers, and the firms in 3rd, 4th and 5th positions appear either to be maintaining or to be increasing their market share.

Concentration measures take no account of imports or exports. Therefore the concentration ratio has to be interpreted differently in cases where there is a high level of imports. The presence of a market for imported wines in New Zealand does not alter the dominance of the largest firms in the industry as imports do not exceed 5% of the total market.

Economic theory indicates that where conditions of high concentration exist there is likely to follow a less than optimum allocation of resources and less than optimum conditions for consumer welfare. But the concentration ratio is not the only oligopoly indicator. Vertical and horizontal integration, behaviour of firms in the industry and government policies are also oligopoly indicators.

Government policies may affect the level of concentration in three major ways: through tariff barriers and import quotas in order to protect the domestic industry from foreign competition, through subsidy or statutory reorganization schemes, and through nationalization of the industry.

High concentration ratios at the production level together with the presence of vertical and horizontal integration in the marketing system have established that the wine industry has an oligopolistic structure.

5.5 - Summary

The findings presented in this chapter show that the wine industry is highly concentrated because a few firms control more than 70% of the

market share, among more than a hundred medium and small wine production enterprises.

A Herfindahl Index could not be calculated because data on the market share of every single firm in the industry were not available, but an approximation of this index was estimated by grouping firms of similar size. The approximation of the Herfindahl Index is either equal to or lower than the true value index. The approximation of the Herfindahl Index for the wine industry was H = 0.20373, which was higher than those of other highly concentrated New Zealand manufacturing industries. Only three other industries in New Zealand displayed higher index values than those shown for the wine industry.

The concentration ratio showed that in 1973 four firms controlled 71% of the market. In 1981 six firms controlled about 87% of the market. These high concentration ratios at the production level together with the integration of other levels of the marketing system are indicators of the wine industry's oligopolistic structure.

CHAPTER 6

INDUSTRY CONDUCT

6.0 - Introduction

The relevance to society of an industry's behaviour depends on its effect on the public interest. Economic theory predicts that if the industry's behaviour departs from the norms of perfect competition consumer welfare is not being maximised. It also predicts that if prices are set at higher levels than competitive prices, the maximum benefit to society is not being achieved.

This chapter examines the behaviour of the wine industry with respect to pricing and output strategies by which firms endeavour to achieve their business objectives within the industry structure outlined in previous chapters.

This chapter also examines conduct patterns of product differentiation and quality of products and services to the consumer.

6.1 - Theoretical approach to industry conduct

Industry conduct reflects the behaviour of firms in the industry within the environment of the industry's structure. In oligopolistic industries firms react to economic forces around them and in response to other firms' behaviour, or to their conjecture about other firms' responses to their own behaviour. Therefore, the importance of market structure lies in the way it induces firms to operate and in the way it affects welfare. Caves (1967:37) noted that "market conduct consists of a firm's policies toward its product market and towards the moves made by its rivals in that market".

There are several important aspects of market conduct to consider such as pricing behaviour, output determination, product variety and quality, and innovation. In oligopolistic markets firms normally set their own prices and adjust these prices in response to changing market conditions or to changes introduced by rivals. Caves (1967) pointed out that when the

product is undifferentiated this process of adjustment occurs very quickly. By contrast, when the product is heavily differentiated oligopolists are less responsive to one another's price changes. Baumol (1959) noted that oligopolists are reluctant to employ price cutting as a competitive weapon and that competitive activity often tends to take the form of advertising and product differentiation.

Theories of oligopoly indicate that if market concentration is high, pricing decisions among firms tend to be interdependent, and that managers recognise that profits are usually higher when co-operative policies are pursued. Nevertheless, co-ordination of pricing policies is not easy to achieve when costs and market share disparities engender different prices and output preferences among firms in the industry. Oligopolistic behaviour can also be orientated towards mergers and takeovers conducive to increase market power.

6.2 - Price and output determination in the wine industry

The New Zealand wine industry has had to face a longstanding threat of competition from imports of overseas wines. If a system of free imports without tariff barriers existed, overseas wines could reach the New Zealand market at lower prices than those of local wines.

Cooper (1977) stated that a long tradition of government lobbying has been developed by winemakers in order to gain protection from imports. Prior to the formation of the Wine Institute, winemakers co-ordinated and channelled their lobbying activities to government through three different associations: "The New Zealand Wine Council, Inc", "The Hawkes Bay Grape Winemakers' Association" and "The Viticultural Association". Submissions from the three associations to the Emergency Protection Authority 1972 and to the Tariff and Development Board 1973 requested protection against all wine imports by retaining import control and by increasing tariff barriers. In 1973 the Tariff and Development Board 1973 established a minimum threshold price beneath which imported wines were unable to enter (Section 7.4). As the minimum level of prices for imported wines was set at one dollar higher than quality local wines, winemakers had the opportunity to set their prices at high levels without attracting consumer resistance to local wines.

Determination of effective prices seems to be dependent in most cases on a firm's relative market share, costs, product differentiation, demand expectation, promotion policies and brand position in respect to others. Some winemakers stated that they determine their prices by the application of the full cost rule. Profit determination required by individual firms could be based either on a percentage of their investment, on a percentage of their costs or on a percentage of their projected sales. One of the firms in the industry stated that it based its profit requirement on a percentage of the total cost (private communication).

The determination of individual prices for the various items produced depends on marketing considerations such as demand for the product, promotion strategies, position of the product in relation to others, product quality and product image. Differences in price determination policies are reflected in the disparity of some retail prices. Table 6.1 shows private trade prices of Riesling from five wine-making companies (the private trade price for Riesling has been accepted by the Tariff and Development Board as the benchmark for white vinifera table wine and is considered a representative New Zealand sample).

It is important to acknowledge that there are other influences affecting price decisions such as government intervention, either in the form of protection or in the form of price controls, uncertainty of demand and inventory policies. For this it is relevant to look at the movements of wine prices when there are changes in conditions of demand and/or supply of wine. Table 6.1 shows the movement in the price of Riesling from 1973 to 1979 and Table 6.2 the percentage increases in the retail prices of wine from 1968 to 1978. Over that period the average annual percentage increase in wine prices does not differ from that of the consumer price index, although yearly differences are evident. The prices of wine, deflated by the consumer price index, showed a substantial increase in the years 1976 and 1978 (Tables 6.1 and 6.2).

Statistical evidence presented in Chapter 3 (Figure 3.1 - Section 3.2.1) showed that in the early 1970's supply exceeded demand by nearly 10 million litres, and that by 1975 there was a reduction in output of more

Table 6.1 - Riesling table wine - private trade prices

	PRICES						% Increase over 1973 Base year					
Per litre	Aug. 1973	March 1976	June 1977	June 1978	June 1979	Aug. 1979	Aug. 1973	Mar. 1976	June 1977	June 1978	June 1979	Aug. 1979
Corbans	1.73	2.51	3.73	4.20	4.28	4.55	-	45.1	115.6	142.8	147.4	160.3
Cooks	1.76	2.61	3.93	4.13	4.36	-	-	48.3	123.3	134.6	147.7	
Penfolds	1.67	2.56	3.56	3.68	3.76	-	-	53.3	113.2	120.3	125.1	
Montana	1.56	2.63	3.42	4.53	4.64	-	-	68.6	119.2	190.4	197.2	
McWilliams	-	2.92	3.51	4.08	4.40	-	-	-	-	-	-	
Average	1.68	2.65	3.63	4.12	4.29	-	-	57.7	116.1	145.2	155.3	-
Deflated values (1973)	1.68	1.91	2.33	2.26	2.12	-						

Source : WINZ, Feb. 1979 and Oct. 1979
Units : NZ$ and %'s
Years : 1973 and 1976 to 1979

Table 6.2 - Percentage increases in retail prices of wine and the Consumer Price Index 1968 -1978

June Year	Dry white and Red	Spark-ling	Standard Sherry	Sweet White	Flagon Sherry	Yearly average % increase	Consumer Price Index	% Differ-ence
1968	7	-	-	3	-	5	3.5	+1.5
1969	-	-	3	-	3	3	5.2	-2.2
1970	-	-	3	-	-3	3	5.3	-2.2
1971	17	8	17	19	-14	14	11.0	+4.0
1972	4	3	6	5	3	8	7.5	-3.3
1973	-	4	2	-	2	3	7.6	-5.0
1974	-	4	2	-	2	3	10.0	-7.4
1975	14	12	13	3	11	10.5	14.9	-4.3
1976	34	18	23	41	20	27	17.7	+9.5
1977	19	10	13	18	11	14	14.1	+0.1
1978	16	8	19	13	19	15	12.2	+8.8
% change								
68-78 (*)	10	7	10	9	9	9	9.5	-0.5
73-78 (*)	16	11	14	14	13	13.5	13.8	-0.2

(*) Annual average

Source : Bidwill, Wakeman, Paine & Co 1978:23

Unit : %
Year : 1968 to 1978

than 8 million litres, which was followed by an increase in prices. These movements of prices and output have to be examined under a broader perspective of other environmental pressures brought about by government legislation, demand conditions, industry investment, industry structure and marketing strategies. Some of the environmental conditions which caused the increases in supply mentioned above were initiated by the 1968 budget when the government firmly expressed its support for the wine industry. This statement of support was subsequently reflected in several pieces of government legislation mainly directed towards protecting the industry from overseas competition (Chapter 7). These protective measures encouraged growers and winemakers to embark on a process of expansion of vineyards which caused considerable increases in the volume of output. Winemakers appeared to have optimistic expectations regarding future increases in demand. This optimism was reflected in a statement which appeared in an article published by the Australia and New Zealand Bank (1973:8): "there seems to be no reason why this strong upward trend should be checked, given overseas experiences". However, high prices, lack of good quality wine and/or of types of wine wanted by the consumer and lack of appropriate marketing strategies attracted some consumer resistance to increasing consumption, and demand did not grow at the same rate as supply. By 1973 the production of wine exceeded demand by 10 million litres. Submissions to the Emergency Protection Authority 1972 asserted that there was an increasingly large oversupply of wine in New Zealand.

Grape prices were affected by the market disequilibrium between supply and demand and they substantially decreased over a period of five years (Section 4.1.1). Total grape production decreased mainly due to the decrease in grapes grown in winemakers' own vineyards. The grape production from independent growers remained stable (Figure 3.3 - Section 3.2.3). Therefore, the reduction of grape production at a time of wine oversupply was an action taken by winemakers themselves.

Winemakers sought more government protection from overseas competition as they viewed restrictions to imports as the solution to their problems. Restrictions would allow the maintenance of internal prices and would increase demand for local wines (NZ Dept. of Trade and Industry 1973). The submissions to the Tariff and Development Board succeeded in both

respects in that consumer prices were maintained and imports decreased from 1974 to 1978 by more than one third in volume. However, the market share gained by the restriction of imports was not large enough to absorb the excess supply of wine.

From then on several changes took place in the industry. Winemakers became more aware of the need to produce types of wines that consumers wanted. Production of table wines surpassed production of dessert wines (Figure 3.1 - Section 3.2.1). The demand for certain varieties of grapes to fill this need increased, and growers and winemakers started planting classical varieties. Grape prices for these varieties have been steadily increasing since 1975.

Other changes also took place between 1970 and 1980. Over that period foreign capital was invested in the industry and some structural changes occurred. The industry became more concentrated through vertical and horizontal integration. Several firms increased their expertise in the production and marketing sectors as they became aware of the need to increase wine quality standards and to improve marketing strategies. Establishment of the Wine Institute as a united body representing the industry also gave winemakers a greater opportunity for co-ordination.

Co-ordination of pricing decisions in oligopolistic industries is important. There are several recognised forms and degrees of co-ordination, including collusion, amalgamations, mergers, takeovers, price agreements, price leadership and tacit co-ordination. In the wine industry it appears that concentration and takeovers rather than formal agreements tend to take place. However, some degree of tacit co-ordination may be pursued by the Wine Institute and winemakers themselves.

The policy of the Wine Institute, which is not necessarily representative of all firms in the industry, is to achieve steady growth. Its aim is to "plan for orderly growth undistorted by major shortfalls or surpluses, either in total grape supply or in particular varieties" (WINZ 1981:13).

Some of many functions of the Wine Institute are to co-ordinate, express and represent the policies and views of the wine-making industry of New Zealand. Discussions on price and output policies have taken place among

members of the Wine Institute and sometimes with outside authorities. The Wine Institute executive officer, Mr T. Dunleavy, emphasised that winemakers did not contravene the Commerce Act and that there have not been formal agreements on the level of prices and/or output (private communication). The dilemma for individual firms is to conform to industry policy and at the same time aim at higher individual output levels to maintain or to increase their market share. Some winemakers have expressed the fear that if present trends of vineyard expansion continue the industry will face another period of oversupply of wine. In the Wine Institute sixth annual report (WINZ 1981:12) some concern was expressed post-1981 vintage that "grape planting may be proceeding at a rate which may lead to problems in wine disposal". The Wine Institute (WINZ 1981) has advised intending growers to ensure that they have firm long-term arrangements with purchasing wineries before undertaking any major plantings. Wine growers have their own association, the "New Zealand Grape Growers' Council", which in a submission to government in 1979 also considered that the monitoring of establishment of new vineyards was important.

The Wine Institute in its Industry Study and Development Plan 1978 expressed concern about the high level of wine retail prices reaching the threshold of consumer resistance. However, the Wine Institute's policy is to discourage the lowering of prices (WINZ, Feb. 1979:103) "to increase sales by lowering prices through lesser quality is a retrograde step that will ultimately lead to degradation, negating the positive gains made in quality and prejudicing the industry's long term future, both domestically and at export". Except for statements like this which indicate the guiding role of the Wine Institute towards co-ordination of action, there appears to be no evidence to support the presence of formal price agreement among winemakers. In previous years the co-ordinated action among winemakers has been mainly directed towards gaining government protection against competition from overseas wines which achieved the implementation of high duty rates for all imported wines and allowed winemakers to set high prices for local wines (Chapter 7). Nevertheless, it appears that aiming at orderly growth for the whole industry would imply some kind of co-ordination among winemakers in the future if this is to be achieved. Mr T. Dunleavy, in the 1981 annual report of the Wine Institute advocated co-operation among winemakers (WINZ 1981:30): "the challenges and uncertainties of the next five years

will impose considerable strain on that traditional spirit of co-operation, and it is my fervent hope that all members of the industry will continue to respond as they have so often in the past with a recognition that their own individual welfare is best advanced by joint effort to promote the interests of the industry as a whole".

6.3 - Product quality

Winemakers have a variety of decisions to make in relation to types of grapes to grow or buy, wine-making processes, varieties of wines to produce and packaging for different types of wines. All are decisions which may affect the acceptance of the product in the market and therefore the final performance of the firms.

The change towards different types of better quality wines from vinifera varieties has been long promoted by the Ruakura Agricultural Research Station and lately by the Wine Institute. In 1980 new standards for production and presentation of New Zealand wine were introduced. The addition of water, sugar and other additives was regulated by the Food and Drug Regulations 1980. The objective of these regulations was to encourage the making of better quality wine and to indicate to consumers the kind of wine they buy. The Wine Institute believes that the new regulations have worked to the consumers' advantage (WINZ 1981). The new regulations established that any table wine in the market should not contain more than 20% of substances other than grape juice. If this can be enforced it would mean a change in the wine-making practices, as there were some wines which contained up to 80% of water. The Consumer Institute (Anonymous 1980) tested 90 wines from 32 firms made prior to the 1980 vintage using a method of analysis newly developed at Waikato University (Chemistry Department). The method of isotope analysis revealed the composition of the alcohol in the wine, in terms of the contribution made to it from natural grapesugar and added cane-sugar respectively, and the composition of the water making up the grape juice (Anonymous 1980). This system of analysis allows differentiation between water from the ripe grapes and water added after harvest. The results of those analyses showed that most of the dessert wines had very low quantities of grape juice and that many sparkling wines were of very low quality. Only 11% of the table wines tested had approximately 100% pure grape juice; 13% had

about 95% of grape juice; 33% were down to 80% of grape juice; 16% had a grape juice content of two thirds or less; and about 20% had a level of grape juice as low as one-fifth. The remaining 7% accounted for dessert wines which were considered poor quality wines.

6.4. - Product differentiation in the wine industry

In the wine industry in New Zealand there is considerable diversification of brands and products. Every manufacturer has his own brand or brands with a diversity of products easily identifiable by name, bottle design, label or package. Some names of wines are directly associated with a particular brand (e.g, names like: Alicante, Bakano, Cresta Dore, Liebestraum, Velluto Rosso, and Velluto Doro among others, can all be identified with their manufacturers).

Advertising is also aimed mainly towards promoting sales of a particular brand. Slogans like "Montana leading New Zealand in the world of wine" or "From McWilliams in the pursuit of excellence", are examples of persuasive advertising towards promoting "company names". This type of advertising aims at creating preferences through reliance on wine-making reputation, and at evoking an emotional response towards the product of a particular firm.

In the early 1970's glass bottles for wine became more standardised and the variety of bottle shapes used for the bottling of wine decreased significantly until 1977 (Lucas 1977). In recent years different bottle shapes have again appeared in the market and diversification is quite apparent (e.g., carafes and casks).

The degree of differentiation can be measured by looking at its principal effects. The effect most frequently emphasised in the economic theory literature is that of the individual seller who is able to raise the product price above that of his rivals while at the same time retaining the customers who prefer the product. One of the firms in the industry, McWilliams Wines Ltd, claimed that during the 1970's their prices were on average from 10% to 20% higher at retail levels than those of its competitors due to consumer preference for its products (Table 6.3). It appears that in recent years price dominance has been gained by Montana

Table 6.3 - Wholesale liquor store price list - 1973

	Sherry (Flagons)			Table wine (3/4 bottles)					
	Dry	Medium	Sweet	White D	Still S	Red	Still	Rose R	Sparkling S
Corbans	2.38	2.38	2.38	1.15	1.22	1.15	-	1.76	-
Delegats	-	2.05	2.25	-	-	-	-	-	-
Glenvale	-	2.15	2.15	0.85	-	-	-	1.30	-
McDonalds	2.35	-	2.35	-	-	-	-	-	-
McWilliams	2.61	2.61	2.61	1.24	1.15	1.24	1.15	1.54	1.80
Montana	2.10	2.10	2.10	0.96	0.98	1.22	0.98	1.56	1.72
Penfolds	2.25	2.25	2.25	-	-	1.05	1.05	-	-
Vidals	2.30	2.25	-	-	-	-	-	-	-
Waihirere	-	2.15	-	-	0.93	-	-	-	-
Villa Maria	2.25	2.30	2.35	1.05	1.05	1.05	-	-	-
Average Price	2.31	2.24	2.30	1.05	1.06	1.14	1.05	1.54	-
% Maximum price over lowest one	24	27	24	45	24	18	17	35	-
% Maximum price over average one	12.5	16	13	18	14	9	7	14	-

Source : Wholesale Liquor Store - Price List 1973

Unit : NZ$
Year : 1973

Wines (Table 6.1).

Price differences are not the only consequence of product differentiation among established firms. Frequently the force of preferences for existing products is shown in the disparity of the market share. A high degree of concentration is usually associated with significant product differentiation and it appears that both conditions are present in the wine industry.

6.5 - Product accessibility and the present distribution system

An important service to provide in any industry is an efficient product distribution system. There are three main channels open to winemakers (Chapter 4): direct sales ex-winery, which accounts for only 5% of the total volume of sales, the specialist wine retailer, and finally the wholesaler who warehouses and distributes 73% of the total sales (WINZ, Feb. 1979).

The Industry Development Commission (IDC), in the summary which prefaced its 1980 report stated that development of the wine industry to its full potential would be constrained by consumer price resistance unless major elements in the consumer price were subjected to some degree of restraint (NZ Dept. of Trade and Industry 1980). The most important element of the consumer price is the distribution margin. The retail margin for wine shops is 40% based on the resellers' buying price plus sales tax. The hotel price adds 50% on the resellers' buying price and restaurants have margins of 110% to 150% (Table 6.4).

The IDC reported that for every dollar spent on table wine at a hotel store or at a wine reseller the consumer paid approximately (NZ Dept. of Trade and Industry 1980:53):

13 cents for wine
12 cents for packaging
16 cents for winemakers other costs and profits
12 cents for Sales Tax
47 cents for distributive margins

$1.00

Table 6.4 - Price margins in the distribution of wine

	On New Zealand Wine	On Imported Wine
Starting point	Delivered into Merchant's Warehouse	Duty paid landed price in Warehouse
Mark-up	17.6%	15% or 20%(*)
	Hotel price (Tax not included)	
Sales Tax	20% on Hotel price (**)	20% on Hotel price
	22.5% (***) or 25% on Hotel price + tax	20% on Hotel price + tax
	Private Trade price	
	40% on Hotel price + tax	
	Wine Resellers' Price	

Source : Industries Development Commission (1980 Report:13)
Year : 1978

* Information suggests that most merchants use 15% mark-up rather than 20%.

** Sales tax has been changed. In 1980 was 50 cents a litre for table wine and 60 cents a litre for fortified wines.

*** This percentage is widely adopted and has been used in determining the New Zealand Private Trade Prices.

The IDC concluded that (NZ Dept. of Trade and Industry 1980:68): "in the case of wine the free play of competitive market forces which normally determines the element of distribution cost in the final price to the consumer is distorted by the current liquor licensing laws". The IDC also concluded that (NZ Dept. of Trade and Industry 1980:58): the industry should "develop with less reliance on community support (by high levels of protection and higher than justifiable prices to the consumer)". In order to correct the system the IDC called for greater competition in the form of sales of wine in supermarkets, abolition of winemakers' licences, de-licensing the whole distribution of wine, abolition of restrictions on wine resellers by allowing them to sell imported wine, and other measures to curtail protection for a few distributors. The IDC also proposed to expose the New Zealand industry to increased competition from imported wines in order to create more avenues of competition for the wine consumer's dollar, and to remove any barriers which might have lessened the opportunities for such competition.

The Wine Institute (WINZ 1981:16) pointed out that "during the period between the formulation of IDC's recommendation and the final decisions by the government, market prices in the liquor distribution field erupted in a price war which began to produce the kind of price competition which IDC was seeking to generate" and that "this atmosphere of intense competition ..... removed from the government some of the pressure to apply the fairly radical measures proposed by IDC".

It is not possible, however, to conclude that the response of the liquor distributors was in fact a direct result of market pressures of competing distributive interests. In 1981 several distributors engaged in price discounts. When Wilson Neil, a Dunedin based merchant, bought five PSIS outlets, the Nathans and Ballins outlets developed the "Liquorland" umbrella. Wilson Neil and "Liquorland" advertised discounts on a few wines and spirits. This move was followed by New Zealand Wine & Spirits Ltd outlets and by "The Cellars", a group of Lion Hotel outlets, both offering similar discounts. Taking into consideration that Lion owned half of NZ Wine & Spirits Ltd, and that ownership connections exist among other distributors (Figure 4.2, Section 4.1.2), it would be unrealistic to assume that such discounts were the result of competitive market forces. It appears that prices remained substantially unchanged and that

normal prices still applied for more than 95% of items (The NZ Wineglass 1981).

In spite of the IDC recommendations for freeing the market, the government did not restructure the distribution system. The government declined to de-license the wholesaling of wine and it declined to permit sales of wine in supermarkets. Basically this means that there have been no fundamental changes to the distribution system and that the sales of wine remain under the same licensing system that has been operating in the past, permitting the distribution group to maintain its oligopolistic influence in the market.

6.6 - Summary

Industry conduct at the levels of production and distribution has been discussed in this chapter. Data from statistical sources and information from private sources have been used for the interpretation of pricing and output behaviour at the production level.

Total industry production over the past decade has shown that when the industry faced oversupply, individual winemakers opted to cut output in order to maintain prices. There is no evidence of formal price agreements among winemakers but there have been statements made by executives of the Wine Institute which aimed at promoting co-ordination among winemakers.

The existence of product differentiation has also been established in this chapter. Marketing services under the present distribution system are an important element of the cost component price as distribution margins are 47% of the final retail price. Barriers to competition in the distribution sector are supported by the licensing system which has helped to maintain the oligopolistic structure of the market.

The IDC report called for a greater measure of competition as a solution to the ills of the distribution system through a de-licensing of the whole system. However, the IDC recommendations were not accepted by the government and therefore the distribution system continues to operate in its oligopolistic form.

CHAPTER 7

GOVERNMENT POLICIES

7.0 - Introduction

Legislation concerning the wine industry covers grape growing, wine-making, retail licensing, sales, taxation, import regulations and export incentives.

It has been stated previously that the environment in which a marketing system operates influences its structural development. In New Zealand, government protection policies for local industries, and in particular for the wine industry, have played an essential role in the industry's development and have consequently been an important element affecting consumer welfare. Other regulations have also directly affected consumer interest by allowing certain practices in wine-making.

The licensing system and other key measures of government legislation to grant protection for the wine industry and legislative measures concerning the public interest are identified and discussed in the present chapter.

7.1 - Winemakers - Legislative framework

7.1.1 - Winemaker's licences

Wine-making licensing goes back to the 1914 Licensing Amendment Act which provided that wine should not be made without a licence. Licences were to be granted only to persons of "good character". Any holder of a winemaker's licence was allowed to make wine from any fruit (other than pears and apples) grown in New Zealand and to sell this product in quantities of two gallons or more. The only requisite was to display the name and address of the licence holder on every container of wine sold.

The 1914 Act was replaced by the Licensing Amendment Act, No. 2 - 1953, which was in turn replaced by the Sale of Liquor Act 1962. The 1962 Act remains in force. A necessary condition to manufacture wine for sale is

to hold a wine-making licence issued under the 1962 Act. There are two types of winemaker's licences: the grape wine licence and the fruit wine licence. Holders of such licences are required to adhere to a series of regulations: no winemaker can be a holder of both licences; the quantity produced should not exceed the quantity specified in the licence and locally produced wine cannot be blended with imported wine. The winemaker's licence also allows holders to sell wine in quantities of not less than one pint. Licences remain valid for a period of one year and renewals are granted under the same conditions which applied at the time they were first issued.

The Industry Development Commission (IDC) report (NZ Dept. of Trade and Industry 1980) recommended that winemaker's licences be abolished and that registration would suffice. A draft to introduce a Bill for a separate Winemakers' Act has been prepared. This would remove legislative authority from the Sale of Liquor Act which is basically designed to control sale and not manufacture of alcoholic beverages.

7.1.2 - Food and Drug Regulations

The first regulations for control of wine-making issued under the Sale of Food and Drug Act 1908 were comparable to those existing in other countries with longer histories of wine-making. These regulations prohibited the addition of water to grape juice, permitted only the use of wine spirits for fortifying, and specified that wine should be made from grapes only. Had such regulations been enforced, they would have achieved high quality standards in the production of wine in New Zealand. However, the general practices of addition of water and sugar for the making of table wines, and the making of fortified wines by the addition of spirits from sources other than the distillation of wine, continued.

The Food and Drug Regulations 1946/136 and the Food and Drug Regulations 1973/173 permitted the addition of sugar and other additives to wine.

The Food and Drug Regulations 1946/136 defined wine as the alcoholic fermentation of the juice or must of grapes. Wine made by fermentation of fruit other than grapes should be labelled as "Fruit Wine". Addition of

sugar was permitted in a proportion not exceeding 2 lbs per gallon of juice, which under a later Amendment was converted into metric form, allowing the addition of 1 kg of sugar per 5 litres of juice.

Among the permitted additions was wine spirit for fortifying which, as defined by the same regulations, should be the rectified distillate of wine. The spirits added were actually the result of the distillation of "marc" (by-products).

The Food and Drug Regulations 1973 made legal the use of uncoloured and unflavoured potable grade spirits. The spirits to be used for fortifying purposes were to be not less than 80% alcohol. The regulations listed permitted additives and preservatives and improved some limits on mineral matter specified as soluble chlorides, soluble sulphates and soluble acid.

A new regulation relating to wine, Food and Drug Regulations 1973, Amendment No. 5, 1980/73, redefined wine as the product of partial or complete alcoholic fermentation of grape juice, or grape juice and other portions of grapes or the reconstituted product of concentrated grape juice and drinking water. It also regulated the use of additives, fining and stabilizing agents, gaseous agents, preservatives, sweeteners and back blending agents.

Amendment No. 5 also provided specifications on the labelling of wine and wine products: the label should indicate country of origin of the wine and should also include the source of ingredients used in the manufacture of the wine product. If reconstituted grape juice has been used it should be labelled so in 4 mm lettering. If the words "Premium" or "Private Bin" are used the amount of grape juice should be at least 95% by volume of the finished wine. If the label makes references to a particular variety of grape, the wine should contain not less than 75% by volume of juice derived from that variety. Dessert wines and flavoured wines should be labelled in 4 mm lettering.

The same Amendment also made provisions for the making and labelling of sparkling wine, dessert wine, flavoured wine and wine liqueur. Sparkling wine shall be wine which is oversaturated with carbon dioxide under

pressure. Sparkling wine labelled "bottle fermented" shall not contain carbon dioxide other than that generated by its own natural fermentation and such fermentation shall not take place in a container of a capacity exceeding 5 litres. When sparkling wine is labelled "Charmat process" or "naturally fermented" it shall not contain carbon dioxide other than that generated by its own natural fermentation. The difference between "bottle fermented" and "Charmat process" is that for the former the secondary fermentation takes place in a bottle, and for the latter the secondary fermentation takes place in a closed stainless steel tank where the wine absorbs its own carbon dioxide. No gas should be artificially introduced in either of the two processes. This regulation is important as most of the sparkling wines manufactured in New Zealand are made by the addition of carbon dioxide into sweetened table wine.

For the making of dessert wine the latest regulations retain the use of potable spirit as an acceptable and lawful practice. Dessert wine shall contain not less than 15% and not more than 22.9% by volume of alcohol.

Flavoured wine, according to the same Amendment No. 5, shall not contain more than 22.9% by volume of alcohol and the amount of grape juice shall exceed 40% by volume of the finished product.

Wine liqueur shall contain not less than 20% and no more than 22.9% by volume of alcohol, and the amount of grape juice shall exceed 40% by volume of the finished product.

In summary, the first regulations on wine-making issued were based on regulations in force in other wine producing countries which had long traditions and high standards in wine-making. The addition of water was prohibited but New Zealand winemakers resorted to the use of water, sugar and spirits for the making of wine. Subsequent regulations made legal what already was a common practice, that is the production of adulterated wine was legalized. The Food and Drug Regulations of 1980 gave more protection to the consumer than previous laws regarding wine-making practices but they still did not provide the high standards in wine-making in force in other countries. One of the major advances in the consumer's interest is the provision of labelling requirements to indicate to the consumers what kind of wine they are buying. However, there are still

avenues for flavoured wines to be sold in restaurants in unlabelled containers as "wine of the house". Some winemakers are of the opinion that the making of flavoured wines should be prohibited. Enforcement of the regulations on wine-making had apparently presented some difficulties in the past. The Food and Drug Regulations 1946/136 allowed the addition of 2 pounds of sugar per gallon of grape juice. Statistical data shows that the sugar actually added was double the amount allowed by the regulations (Table A.3 - Appendix A). The Food and Drug Regulations 1973 allowed the addition of 1 kg of sugar per 5 litres of wine. In 1975 the total wine production was 34.6 million litres. Of these only 18 million litres were grape juice, with the remaining 16.6 million litres being sugar and water.

Prior to the 1980 vintage the Consumer Institute tested 90 wines from 32 firms. Results of this analysis confirmed statistical findings, as 76% of table wines tested were well below 80% of grape juice, and some of them had only two thirds or less of grape juice content. Another 20% of table wines had a level of grape juice as low as one fifth. Also most of the dessert wines investigated had very little grape juice in them (Section 6.3).

The regulations introduced in April 1980 established that the amount of grape juice used in making table wine must be at least 80% by volume of finished wine. Table wines with less than 80% should be labelled "flavoured wines". In September 1981 the Health Department seized thousands of litres of wine throughout the country for contravening standards under the 1980 Food and Drug Regulations. The wine was later released to be sold under the label of flavoured wines. However, in spite of attempts by the Health Department to enforce the regulations, figures from the 1980 vintage indicate that water was still added to the grape juice (46.6 million litres of wine were produced from 30 million litres of grape juice, a shortfall of more than 50%). The total wine production in New Zealand consists of 65% of table wines and 35% of dessert wines. By law, table wines should have a minimum grape juice content of 80%, and dessert wines a minimum grape juice content of 60%. To produce 46.6 million litres of wine (1980 production figures) a minimum amount of 37 million litres of grape juice would have been needed. The amount of grape juice available was only 30 million litres, therefore it appears that 7 million litres of wine were not grape juice.

7.1.3 - Distillation Act

The Distillation Act 1971, which consolidated the Distillation Act 1908, had provisions for the making and use of fortifying spirits. Wine or must can be fortified to a strength not exceeding 22.81% by volume. Flavourings can be added to spirits before fortifying a wine, but a wine to which flavourings have already been added cannot be fortified.

Application for a permit to produce brandy can be made under Section 12 of the Distillation Act 1971. Although trials made by the Department of Agriculture on the production of brandy proved that good quality brandy could be made from grapes grown in New Zealand, production has not started on a commercial basis. At present, it is not economic for wine-makers to distil wine, losing 80% of the quantity in the distillation process. Furthermore brandy spirit should be matured in wood for several years, which makes brandy production a costly diversification from wine-making (Berrysmith 1972).

7.2 - Sales licensing laws

Present licensing laws on sales have to be understood in their historical context. Distribution of wine has relied on a system established years ago for the distribution of beer. Laws regulating liquor sales have been strongly influenced by the prohibition and temperance movements in the past. The principles on which such laws rest today are that no liquor may be sold without a licence and that the number of licences should be limited to enable the regulation of the trade. It appears that implementation of licensing laws favoured the control of the trade by a few powerful winemakers, wholesale wine and spirit merchants and breweries. Barriers to enter the trade have reduced opportunities for free competition.

In 1879 an amendment of the Licensing Act 1877 allowed, for the first time, sale of wine in wineries and wine shops. Prior to that, sales of wine were allowed only in hotels.

In 1917 the Sale of Liquor Restriction Act temporarily restricted the hours of sale from licensed premises to between 9 am and 6 pm. The restriction became permanent in 1919.

In 1948 the provision to issue wine licences was removed from the legislation but wholesale, charter and hotel licences were extended. In 1958 and 1959 further wine reselling licences were created, restaurants were licensed and some restrictions on sales from wineries were lifted. These licences were easy to get at first, but an amending Act in 1965 restricted again the issue of licences to premises exclusively used for the storage and sale of wine.

The distribution and sale of wine is, at present, regulated by the Sale of Liquor Act 1962 and subsequent Amendments. The right to sell wine is restricted to winemakers, wholesale wine and spirit merchants and resellers. Winemakers can sell their products to merchants and resellers and can also retail their own output directly to the public. Wholesale wine and spirit merchants can sell local and imported wines to resellers and private consumers. Resellers include wine shops, hotels, licensed restaurants, chartered clubs and every other place where wine is sold directly to the public. Wine shop licences have often been given to winemakers. This, plus the fact that breweries and wine and spirits merchants have invested capital in some of the most important New Zealand wine-making companies, leads to control of wine outlets by a group of winemakers and distributors.

Submissions to the Royal Commission on Liquor were made by privately owned wineries asking for protection against control of wine outlets by some winemakers and distributors. Wine resellers' licences were in great demand. Where new licences were authorised many applications for each particular licence were received. The application costs were high and the unsuccessful applicants forfeited their deposit. Small and medium wine producers complained that large producers were favoured, and that some malpractice in the allocation of licences was suspected (NZ Liquor Industry Council 1974).

Submissions by the wine industry to the Tariff and Development Board, 335, August 1973, indicated that there were 366 New Zealand wine resellers' licences, of which 18% were held by wholesale merchants and trusts, 54% by private ownership, 11% by large wine producers, and 18% by small producers. However, these figures could be misleading as it has been shown that wholesalers and breweries have interests in the private trade.

The licensing trusts also play an important role in the control of outlets. Trust control of liquor licensing originated in the prohibition movement about the turn of the century. Three different forms of trust developed in New Zealand. Those which were established in former no-licence areas are known as district trusts and have almost full control of liquor trading in their own territories. Those which operate in existing licensing districts are known as local trusts and are restricted to hotels. A third category, suburban trusts, was created to meet the requirements of no-licence districts in the suburbs of larger cities (i.e. Auckland and Wellington).

The present trust control system was first legislated by Parliament with the Invercargill Trust Act, 1944. The intention in introducing the Bill was to eliminate private profit from the sale of intoxicants (McArthur 1967).

As the licensing trust movement spread to various parts of New Zealand the idea of a national association was promoted. The New Zealand Licensing Trusts Association was formed in 1955. The Trust Association has on several occasions joined other interests in the liquor industry in successful representations to government.

Initial objectives for the constitution of licensing trusts were to give some form of public control to liquor trading and to provide for the distribution of profits for public purposes. However, as some District Trusts had shareholdings in some New Zealand wine companies (NZ Liquor Industry Council 1974), trust control of liquor trading benefited such companies.

The IDC recommendations regarding sales and distribution of wine supported the dismantling of the current distribution system, and suggested that a single licence be required for the sale of wine for final consumption. All existing licences to sell alcoholic beverages to the public would be valid for wine. The IDC also recommended that wholesaling of wine be no longer subject to a liquor licence under the Sale of Liquor Act, and that wholesalers continue to be registered under the Sales Tax Act (NZ Dept. of Trade and Industry 1980).

To introduce a greater measure of competition in the distribution system, the IDC recommended that wine resellers be permitted to sell imported wine (they were restricted to selling local wine) and that the selling of wine to supermarkets and grocery stores also be permitted. The IDC considered that this move, although of benefit to large supermarket chains, would also benefit the public due to a greater availability of the product and lower consumer prices. One supermarket in Auckland which has a provisional wine licence is already selling wine at lower prices than other retail outlets. Other supermarkets have stated in their submission to government that if they were to use their own distribution channels the distribution margin could be reduced from the current 47% to 12.5%.

The government declined to act on the recommendation for sale of wine in supermarkets as introduction of such a measure was considered inappropriate. Therefore the consumer has not gained the benefit of a more competitive distribution system. The government approved that a limited wholesale licence (i.e., limited to sales to other licensees) be available from the Licensing Control Commission. This measure will not reduce the distribution margins or stop concentration of the liquor trade, as wholesalers can still own retail outlets. One of the IDC recommendations which was fully accepted by government was that wine resellers be permitted to sell both imported and domestic wine.

7.3 - Taxation

The Sales Tax Act 1974 established that wine was to be taxed on the basis of 20% of the wholesale price, which included the merchants' margin, glass bottles, packaging, labour and freight. Winemakers felt that this tax system discouraged production and sale of high quality wines. They intensively lobbied to have it changed to an excise duty per volume of liquid regardless of the cost. Because the taxable amount included freight content, there were great differences in tax rates depending on how far from the winery the wine was sold. The Wine Institute requested a specific volume tax of 24.9 cents per litre (WINZ, Oct. 1979).

The report of the IDC recommended that a wine tax of 40 cents per litre be imposed on table and dessert wines and that this tax be indexed to the Consumer Price Index.

The government legislated that wine was to be taxed at a rate of 50 cents a litre for table wines and 60 cents a litre for fortified wines. The rate will be indexed each year to the Consumer Price Index.

7.4 - Import control regulations

For many years all imports of wine have been subject to licence and to tariff rates in order to protect the local industry. In order to avoid competition from overseas wines winemakers have been most forceful in their lobbying to the government.

The Import Licensing Control Regulations 1964 required that, except for exempted goods, a written licence, or a written permit granted by the Minister and issued by the Customs Department were necessary for all imports. The imports of wine were subject to licensing and subsequent application of tariff rates which gradually increased over the years. The duty rates which were in force in 1962 were doubled due to the recommendation of the Emergency Protection Authority 1972. The wine industry had approached the Emergency Protection Authority through several submissions which led to this recommendation. The industry also requested a further increase in the duty rates of all imported wines to reach a minimum differential between New Zealand quality wines and imported wines of at least 70 cents per 750 ml bottle. A year later the Tariff and Development Board established a minimum threshold price of approximately one dollar a bottle higher than quality local wines, beneath which imported wines were unable to enter. Other imported wines above the threshold price were taxed on a sliding scale.

More recently the Licensing Schedule for 1976/77 set the value of licences at only 100% of the previous year which meant an effective drop in volume of 20% to 30%. The tariff governing imported wines was altered from above and below $1.65 per litre to above and below $2 per litre.

The Wine Institute in its Industry Study urgently requested the revision of the tariff for table wines (still and sparkling) and dessert wines. The Institute's proposal was to adopt a formula which would keep constant the price difference to the consumer between domestic and imported wines.

The IDC took a totally different stand on this matter and recommended the liberalisation of imports by exempting wine from the requirement of an import licence, and establishing a "tariff quota" on the following basis (NZ Dept. of Trade and Industry 1980:96):

(a) The level of quota be fixed at $12 million for each of the June years 1981/2 and 1982/3.

(b) Concessionary entry up to this value be provided under Tariff Item 22.05.00x for all wines with an f.o.b. value exceeding $1 per litre.

(c) All wine with an f.o.b. value exceeding $1 per litre be exempt from quota restriction from July 1, 1983.

However, this call for greater competition from imports and gradual phasing-out of protectionist measures was rejected by government which moved towards increasing the tariffs for imported wine. The government approved the replacement of import licences by a tariff quota, the level of which was to be $8 million for existing licence holders and up to $2 million for wine resellers and other liquor outlets.

The current tariff structure is:

a) All imported wines costing less than $2 per litre f.o.b. fall outside the quota. These wines will attract $4.50 a litre duty plus 20% normal duty (10% for Australian wines).

b) All imported wines brought in outside the quota costing more than $2 attract a $2.85 duty plus 20% normal duty (10% for Australian wines).

c) All imported wines costing $2 a litre and above, imported within the quota attract a duty of 85 cents per litre plus 20% of normal duty (10% for Australian).

Under this scheme a bottle of imported wine bought for 1$ reaches a re-sellers' price in New Zealand of $8.65. The contradiction is that a bottle of wine which costs $2 reaches a lower reseller's price than the one which costs $1. Importers would benefit by loading an extra dollar on the price of the wine in the country of origin.

The new regime still offers a great deal of protection to the New Zealand wine industry. Even for wines costing over $2 and imported within the quota, the new duty rate is higher than the previous one (i.e, the previous duty rate was equivalent to 40.5% of c.i.f. price and the new duty rate is 43%).

7.5 - Export incentives

The Export Incentives Trade and Industry Act 1977 includes tax deductions of 25% of the increased value of f.o.b. export sales over annual average export sales in the "base period" (the first three of the seven years preceding the year of the claim) or 25% of gross export sales in the current year if no export sales were made in the "base period". When exporters pay no tax the deduction can be converted to a cash refund of 45% of the incentive deduction. In addition to the 25% allowance there is a 15% deduction during the first two years of a new market development.

Expenditure on export promotion is eligible for a special deduction of 50% over the ordinary deduction of 100%. Development grants of 40% of export promotion expenditure are also available. All export incentives apply to the wine industry.

7.6 - The IDC recommendations and government legislation

The IDC in its report to government made reference to the legislative framework under which the wine industry operates. The IDC noted (NZ Dept. of Trade and Industry 1980:68) that "in the case of wine the free play of competitive market forces which normally determines the element of distribution cost in the final price to the consumer is distorted by the current liquor licensing laws". It also added that "competition in alcoholic beverages is only possible between a select group of licence holders - manufacturers, merchants and resellers - a highly cartelized group characterised by their oligopolistic influence in the market".

The Commission's view was that in order to encourage the industry to attain its full potential, cost reductions must be reflected in prices paid by the consumer. This would in turn assist the industry to increase demand for its product.

The objectives of the plan proposed by the Commission (NZ Dept. of Trade and Industry 1980:77) were "to encourage the quality of domestic wines and to create conditions conducive to containing costs of both wine production and wine distribution so that the consumer can be supplied with his requirements as satisfactorily as possible ....". To achieve these objectives the Commission favoured a change from over-protection against overseas competition and from the restrictive selling practices under which the internal market has been operating up to the present time.

Changes in legislation advocated by the Commission were directed mainly towards increasing competition of outlets by extending the selling of wine for consumption off premises to supermarkets and grocery stores at the discretion of the Licensing Control Commission. Some changes in the present licensing system with retention of restrictive licences were also advocated. The Commission was aware of the likelihood of further control of the wine industry by brewing interests, and therefore recommended that future investment in wine-making by holders of sole licences be brought within the provisions of the Commerce Act.

The Commission saw merit in changing the emphasis on tax revenue. Implementation of a Sales Tax based on volume instead of on wholesale value as it was at that time was encouraged.

Perhaps the most innovative and controversial recommendation of the Commission was the plea for the liberalisation of imports (NZ Dept. of Trade and Industry 1980:85): "the Plan seeks to exert pressure on both winemaker's costs and those distributive margins which are currently the predominant element in consumer prices....". The plan which was to be implemented over a two year adjustment period aimed at a total exemption from import licensing. A system of tariff quotas was to be implemented during the transition period.

The Commission emphasised that the recommendations should be taken as a package of interrelated measures towards the development of the wine industry to full potential. This development would be constrained by consumer price resistance unless the four major elements in the consumer price were subjected to some degree of restraint. These four elements are:

a) Cost of grapes - 13% of consumer price -
recommendation: access to imported grape juice.

b) Cost of packaging - 12% of consumer price -
recommendation: cost containment.

c) Sales Tax - 12% of consumer price -
recommendation: sales tax by volume.

d) Cost of distribution - 47% of consumer price -
recommendation: liberalising channels of wholesale distribution.

The IDC made 39 specific recommendations which it felt were necessary to implement a development plan. Prior to government deciding on any final action on the IDC recommendations it gave opportunity for consultations with Ministers and government officials to representatives of the wine industry.

The government decided that it would not be possible to implement fully the plan proposed by the Commission and gave 5 years to the wine industry to meet wider competition in terms of quality and price. The government rejected the IDC proposal to import grape fruit concentrate for wine-making on the basis that it would affect the unique New Zealand character of wine. The government replaced the ad-valorem rate of sales tax by a flat rate per litre.

While the government recognised the need for improvement in the distribution system to reduce costs, it did not think it was the appropriate time to extend the selling of wine to supermarkets. However, the wine resellers' licences were extended to include the selling of imported wines. The government considered the introduction of a limited wholesale licence which would authorise sales to other licensees. This proposal is currently under revision. The government's final decision on imports was to protect the industry from cheap imports by a system of tariff quotas.

7.7 - Summary

A view of relevant legislation concerning wine production and

distribution has been presented in this chapter. Government protective measures have been the key to expansion of the wine industry, and the licensing system has also been a contributing factor in the development of the industry's oligopolistic structure.

The Food and Drug Regulations have promoted the right of consumers to accurate information and have introduced higher quality standards by the imposition of some restrictions on the amount of water that certain wines can contain. Those restrictions have not been rigidly enforced.

The IDC recommendations have been discussed at length in this chapter. Two key points in the IDC package were the lowering of protection and increasing competition in distribution outlets. Recommendations given by the Commission to achieve these goals were either modified or rejected by the government. The new tariff structure attracts such a level of duty that it does not offer room for competition from imported wines.

Current government regulations allow the distribution sector to maintain a privileged position in the market. Distribution margins have not been modified and the price of wine still doubles from the point ex-winery to the consumer.

A list of the regulations and submissions mentioned in this chapter is included in Table 7.1.

Table 7.1 - List of government legislation and submissions to government mentioned in Chapter 7

Year	Legislation, Submissions
1879	Amendment of the Licensing Act 1877
1908	Sale of Food and Drug Act
1908	Distillation Act
1914	Licensing Amendment Act
1917	Sale of Liquor Restriction Act
1944	Invercargill Trust Act
1946	Food and Drug Regulations 1946/136
1953	Licensing Amendment Act
1962	Sale of Liquor Act
1964	Import Licensing Control Regulations
1965	Amendment of the Sale of Liquor Act
1971	Distillation Act
1972	Submissions to the Emergency Protection Authority
1973	Food and Drug Regulations 1973/173
1973	Submissions - Tariff and Development Board, 335, August 1973
1974	Sales Tax Act
1974	Submissions to the Royal Commission on Liquor, February 1974
1976/1977	Licensing Schedule
1977	Export Incentives Trade and Industry Act 1977
1980	Food and Drug Regulations 1973, Amendment No. 5
1980	Report of the Industry Development Commission

CHAPTER 8

CONSUMER WELFARE

8.0 - Introduction

This chapter introduces a theoretical approach to consumer interest and consumer protection as well as a discussion of antitrust policies, objective information, quality standards and competitive prices. Trade practices in New Zealand regulated by the Commerce Act 1975 and particularly trade practices within the wine industry are also examined.

A discussion on government policies and regulations affecting wine producers and wine consumers highlights the effects that industry protection has on consumer welfare.

8.1 - Theoretical approach to consumer interest and consumer protection

It is implied from economic theory that under a system of perfect competition consumers are perfectly informed about the characteristics of products, and that they choose among the alternatives open to them (Section 1.1). In any market there has to be some mechanism by which producers know what, and how much to produce. In a perfect market, price changes act as market signals. In theory this mechanism ensures that resources are allocated in the best possible way and that all consumers have attained the best possible deal given the income available to them. In perfect markets there is no possible role for consumer protection. However, real markets differ in many ways from the concept of the perfect market and differ significantly in the way that the signalling mechanism works. In actual markets other signalling systems are usually present because information is far from perfect and because sellers often have some monopoly power which interferes with the free movement of prices. Information flows and signalling mechanisms, in a real world market are identified in Figure 8.1.

Information in both directions is usually defective. Advertising is rarely an objective way of passing information to the consumer because it is directed towards persuading the consumer to purchase a particular product.

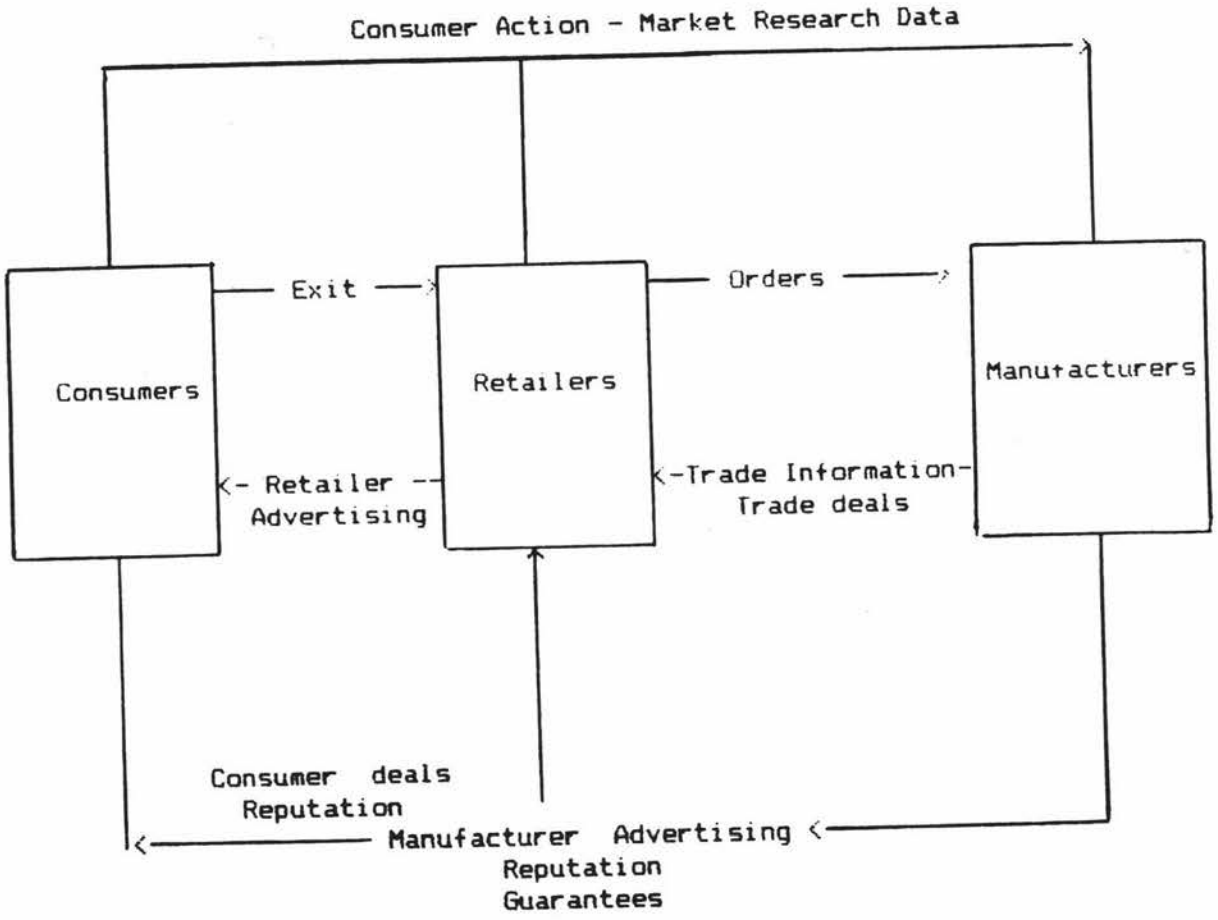


Figure 8.1 - Information flows and signals
(In a simple chain of distribution)

Source : (Morris 1980:12)

In the other direction consumers often have limited access to effective ways of transmitting information about their requirements and preferences. Consumers can express their dissatisfaction by rejecting a particular seller/product and moving to another. This is represented in Figure 8.1 by the term "exit".

Real markets diverge from the conceptual norm of the perfect market by what is known as "market failure". Morris (1980) pointed out some specific causes of market failure:

a) the ability of sellers to influence price (monopoly power),
b) product differentiation,
c) the inability to switch resource uses,
d) the problem of externalities,
e) the lack of perfect information, and
f) the imperfect nature of market signals.

Traditional economic theory indicates that the best possible form of consumer protection is competition policy. This school of thought suggests that market failure should be prevented or corrected by antitrust laws. Another view is that market failure should be accepted as inevitable and policies should be directed towards minimising its detrimental effect on the consumer.

In modern times, legislation and policies designed to protect the consumer have proliferated. Competition policies and objective consumer information have been the main targets of consumer protection. Government attempts to regulate in this complex area have been mainly directed towards policing the marketing activity of sellers with a degree of monopoly power and towards the development of policies to mitigate adverse effects to the consumer. These policies include price control, regulation of advertising, introduction of standards of quality and quantity, and the prevention of the effects of externalities.

As the conditions which must be satisfied for a perfectly competitive market are not attainable in reality, some economists have suggested other notions of competition. Clark (1940) was first to introduce the concept of "workable competition". From the consumer's point of view the important features of "workable competition" listed by Morris (1980:159)

are that: there should be price sensitivity to quality differentials in the products offered; inefficient sellers should not be protected for a long period of time; sales promotional activities, including advertising, should not be misleading; price discrimination which conflicts with the interest of consumers should be absent; firms should be efficient and profits should be just sufficient to reward investment, efficiency and innovation; the activity of sellers should be responsive to consumer demands; and opportunities for introducing technically superior new products and processes should be explored.

In order to preserve some of these features of workable competition, governments have focused increasing attention on providing mechanisms of enforcement and redress for consumer protection. One of these forms of protection has been the implementation of antitrust legislation.

8.2 - Antitrust policies

Antitrust legislation could be directed to either preventing or correcting certain market situations. Preventive antitrust policies are usually designed to prohibit behaviour which is likely to lessen competition (i.e., the prevention of mergers and takeovers). Corrective antitrust policies are directed to eliminate or regulate market power which already exists (e.g., splitting up companies).

Another form of consumer protection has been the nationalisation of some industries which have high fixed costs, and therefore it would be wasteful to have more than one producer in such industries (e.g., electricity generation and railways).

The New Zealand situation and government policies in this area are described in Section 8.6.

8.3 - Information

Consumer information is concerned with making data available to the public to assist consumers in decision making. It includes comparative testing and informative labelling among others.

One of the main informational problems faced by consumers is the assessment of the performance of goods. In practice there is evidence that consumers judge potential performance by price. This indicates that consumers have difficulties in assessing the performance potential of the goods they buy. An aspect of protection against deception is the desirability that information about quantity and characteristics of the product be stated in the label.

In New Zealand, informative labelling for wine is regulated by the Food and Drug Regulations 1973, Amendment No. 5, 1980/73 (Section 7.1.2).

8.4 - Quality

Product quality is a concept which is usually not covered in microeconomic text books, but it is currently being given increasing attention. As quality is difficult to define, it has been described by reference to a number of product characteristics. However, on many occasions the consumer faces uncertainty about quality, and about the characteristics of any particular product. Legislation for consumer protection usually considers two factors. These are the general characteristics possessed by all units of a line of goods, and the consistency of such characteristics for different units of the same line, that is, quality control.

In New Zealand standards of quality related to the locally produced wines are regulated by the Food and Drug Regulations 1973, Amendment No. 5, 1980/73 (Section 7.1.2).

8.5 - Price policies and consumer interest

An important aspect of consumer welfare is the level of prices. It is generally accepted that low prices benefit consumers. However, it is also debated that price constraints can result in reductions on the product range available to the consumer. It is also argued that low profits can lead to restricted supplies and poor quality of products and services.

Pricing policies as consumer protection measures have been widely applied by governments and they have taken many forms. Some directly attempt to contain prices (i.e., price controls) while others attempt to attain or

preserve competition by the regulation of monopoly power.

8.6 - The situation in New Zealand

The most important legislation in New Zealand designed to promote the interests of consumers and to prevent malpractice that may result from monopolies, mergers and takeovers, is the Commerce Act 1975. This Act controls certain trade practices such as pricing agreements, monopolies, mergers and takeovers, control of prices, and strikes against the public interest.

The Commerce Act 1975 defines a monopoly as a situation in which a person either alone or together with any interconnected body corporate is in a position to control or exercise a predominant influence over a market. It includes a situation in which a person or body corporate has the power to determine prices, or to control the production or provision or distribution of a substantial part of any goods or services in any such market.

Part II of the Act specifies that a trade practice shall be deemed contrary to the public interest if cost, prices and profits are at a higher level than would have been obtained but for that trade practice. Also it is considered to be contrary to the public interest if the practice prevents, reduces or limits competition in production, manufacture, supply, transportation, storage, sales or purchase of any goods. However, if it is demonstrable that benefit to the public is sufficient to outweigh any of the effects described above, the practice is then not considered contrary to the public interest.

When the Commerce Commission is satisfied that a trade practice is contrary to the public interest, an order directing the discontinuance of the practice, or allowing the continuance of the practice subject to certain conditions is made. Categories of trade practices against which the Commission may make orders mainly refer to agreements or arrangements between wholesalers, retailers, or manufacturers to restrict competition, and/or the selling of goods at prices or on terms agreed upon among them. Other trade practices against which the Commission may act are the granting of rebates or discounts to buyers of goods calculated with

reference to quantity or value of the purchase.

8.7 - Trade practices in the wine industry

The third Schedule of the Commerce Act 1975 requires Commission approval for any further investment in the wine industry by brewing interests. This provision for monitoring future acquisitions against the public interest, is intended to be a safeguard against control of wine-making passing to brewing interests. However, it appears that there are some inconsistencies in the way that this legislation is applied. Under Section 68 (1) of the Commerce Act 1975, a notice of merger or takeover proposal has to be presented to the Examiner of Commercial Practices who makes a recommendation on whether or not the takeover can take place.

Terms of reference used in the decision to allow or disallow a trade practice are based on considerations of public interest. The criterion to guide the decision of the Examiner of Commercial Practices is the "preservation of competition versus market power" (private communication).

In 1981 two proposals for purchase of shares from two different companies were presented to the Examiner's Office. In both cases about one third control by the buying company was proposed. In one instance the move was disallowed (McWilliams acquiring shares in Cooks' Wines Ltd), and in the other the takeover was allowed (Lion Breweries taking over Penfolds).

The Examiner of Commercial Practices' decisions were justified on the basis that in one of the cases a failing company was involved (private communication). Apparently a key issue taken into consideration is the ability of the independent company to survive without the takeover. If the independent company has been engaged in a substantial development programme and is not in a position to meet its financial commitments and there are no other contenders, the takeover is allowed. The criterion followed by the Examiner is that competition will not be greater if the company disappears due to financial difficulties (private communication).

As a consequence of amalgamations and takeovers over the years the wine industry has become highly concentrated. The system for implementation of the safeguards contained in the legislation does not appear to stop trade

practices contrary to the principle of preservation of competition against market power as defined in Paragraph (f) of Section 21 (1) of the Commerce Act.

8.8 - Producers' interest versus consumers' interest

Wine consumers in New Zealand have for many years been affected by the results of the activities of several pressure groups. The prohibition and temperance movements of the past have played an important role in the development and permanence of some restrictive legislation concerning wine sales. The wine industry had also been actively engaged in intensive lobbying in government quarters through submissions to government and personal contacts (Cooper 1977). At times the interests of both groups have worked together (e.g., restrictions on imported wine, restriction of outlets and thus protection of the trade from new entries). The results of these activities were manifested in government legislation directed to restrict liquor sales and to protect the local industry. Hampton (1973:6) stated that: "... the local wine industry has received considerably more protection than it needs to avoid over-production".

The protection of consumer interest was not a consideration of government in the past as reflected by legislation. However, the protection of consumer interest has been one of the terms of reference of the 1980 IDC study which has taken into account "the interest of the wine producing industry, consumers and the distributive trade" (NZ Dept.of Trade and Industry 1980:viii).

Legislative protection to the wine industry given by the Development Plan 1981 considered several factors including protection from competition, financial incentives, cost containment, taxation and protection of the present distribution system. Protection from overseas competition has been provided by the implementation of a tariff quota (Section 7.4). Financial incentives were given by investment allowances and remissions from sales tax on new plant and machinery. Cost containment was given only for packaging items. Importation of grape juice to contain grape prices was not accepted by government. Taxation measures referred to a change from sales tax to a wine tax (Section 7.3). Protection of the distribution system resulted from the lack of legislative measures to

increase competition. The government decision to decline the IDC proposal to permit the sale of wine in supermarkets has been a key issue to protect the interests of the distribution trade.

Recommendations of the IDC (NZ Dept. of Trade and Industry 1980:58) were designed to:

- "relieve the industry of some of its cost disadvantage relating to grapes and packaging materials,
- reduce the element in consumer prices attributable to distribution and to assist the industry to increase demand for its production,
- ensure that the industry develops with less reliance on community support (by high levels of protection and higher than justifiable prices to the consumer),
- encourage the industry to continue improving the quality of its product and
- encourage the industry to seek to make a greater contribution as a foreign exchange earner while maintaining its contribution as an exchange saver at its maximum."

The non-implementation of some important recommendations of the IDC report means that some of the above stated objectives will not be achieved. The consumer has not been relieved of the elements in price attributable to distribution as the element of competition in order to reduce distribution margins has not been introduced. Again the consumer has not been relieved of the element in price attributable to cost disadvantages relating to grape prices, because the opening of competition through imports of grape juice has not been accepted. Finally the consumer has not been relieved of the element in price attributed to high levels of protection from overseas competition.

Legislative protection of the consumer has been mainly concerned with consumer information. New labelling requirements contained in the Food and Drug Regulations 1973, Amendment No. 5, 1980/73, were intended to protect the consumer against misrepresentations of the product and to provide the consumer with adequate knowledge about the products in the market. The same amendment also made provisions for regulating the content of the wine, mainly by restricting the addition of water and

sugar for different types of wines.

Although the interest of the consumer has been protected as far as improvement of quality standards and of objective information are concerned, the consumer still does not have more competitive prices for the product (local and imported). The Wine Institute report 1978 and the IDC report 1980 pointed out that consumer resistance to price showed signs of developing into a major constraint upon increasing the level of consumption per capita. Within the framework of the present legislation there is no provision for opening avenues for competition, either of imports or of distribution, in order to reduce the level of prices. This means that under present legislation the consumer will continue to be deprived of the benefits of competition to the extent that the government protects the industry from imports and to the extent that the government allows the group of licence holders (manufacturers, merchants and resellers) to maintain their powerful influence on the internal market.

8.9 - Proposed consumer analysis

In previous chapters the organization of the wine industry has been investigated with the view to assessing its performance towards satisfying consumer needs. Legislative measures protecting the consumer and the industry have also been discussed. Value judgements on consumer interest have been based mainly on assumptions of what is "good" for the consumer from the theoretical point of view, not on empirically verified needs.

The problem with the application of a theoretical analysis is how to bridge the gap between theory and reality. Economic theory provides a foundation for consumer analysis and investigation of consumer behaviour confronted by uncertainty about product quality, price distribution and consumer information. Consumer behaviour appears to be related to consumer attitudes, consumer knowledge, consumer perceptions and consumer preferences.

Often consumers have no effective ways of transmitting information about their requirements and preferences. In order to investigate consumer requirements and consumer satisfaction with the products and prices generated under the present system, and to relate these to prospects of

demand for New Zealand wines, empirical data were needed.

A direct approach to the consumer was chosen to collect relevant data and a consumer survey was carried out. Objectives, methods and procedures are described in the next chapter.

8.10 - Summary

Some issues on consumer interest as well as different government approaches to consumer protection has been discussed in this chapter. It has also outlined government consumer protection policies and discussed the implications to the consumer of legislation designed for industry protection. Due to the oligopolistic structure of the wine industry and to government protection, the consumer has been deprived of the benefits of competition. Competition from overseas wines has been restricted by import control regulations and the free play of internal market forces has been distorted by the liquor licensing laws. Effects of government legislation and the industry's market power on consumer interest have been evaluated following the assumption that a departure from perfect competition is a departure from consumer welfare. Consumer requirements and the level of consumer satisfaction with the results of the present production and distribution systems, cannot be adequately evaluated without empirical data.

CHAPTER 9

CONSUMER SURVEY

9.0 - Introduction

Consideration has been given in previous chapters to some of the effects of industry structure and of government intervention on consumer interest. To relate these to actual consumer requirements and perceptions of the products and prices available in the New Zealand market, a consumer study was carried out.

A direct approach to the consumer was chosen to collect relevant data and a consumer survey was planned with the purpose of identifiying wine consumers and their preferences. The consumer survey was also designed to investigate consumer perceptions and consumer satisfaction.

The survey was carried out in the city of Palmerston North in September 1975. A comprehensive questionnaire was developed (Appendix E) and a sample of 237 households was selected at random. Direct interviewing was used to obtain the answers to the questionnaire. Objectives and methodology are outlined later in this chapter.

9.1 - Area and population for the survey

The Palmerston North area is divided into 12 different suburbs as is shown in Figure 9.1. The number of households in each suburb was taken from the Council land use statistics for 1974 (Table 9.1).

9.2 - Sample size

The sample size was evaluated between desired limits of error and estimation of costs and time involved to obtain a higher degree of precision. The formula used to determine the sample size was (Cochran 1963):

$$n = \frac{t^2 \quad \frac{(0.5)^2}{d^2}}{1 \; + \; (1/N) \; \frac{t^2 \; (0.5)^2}{d^2}}$$

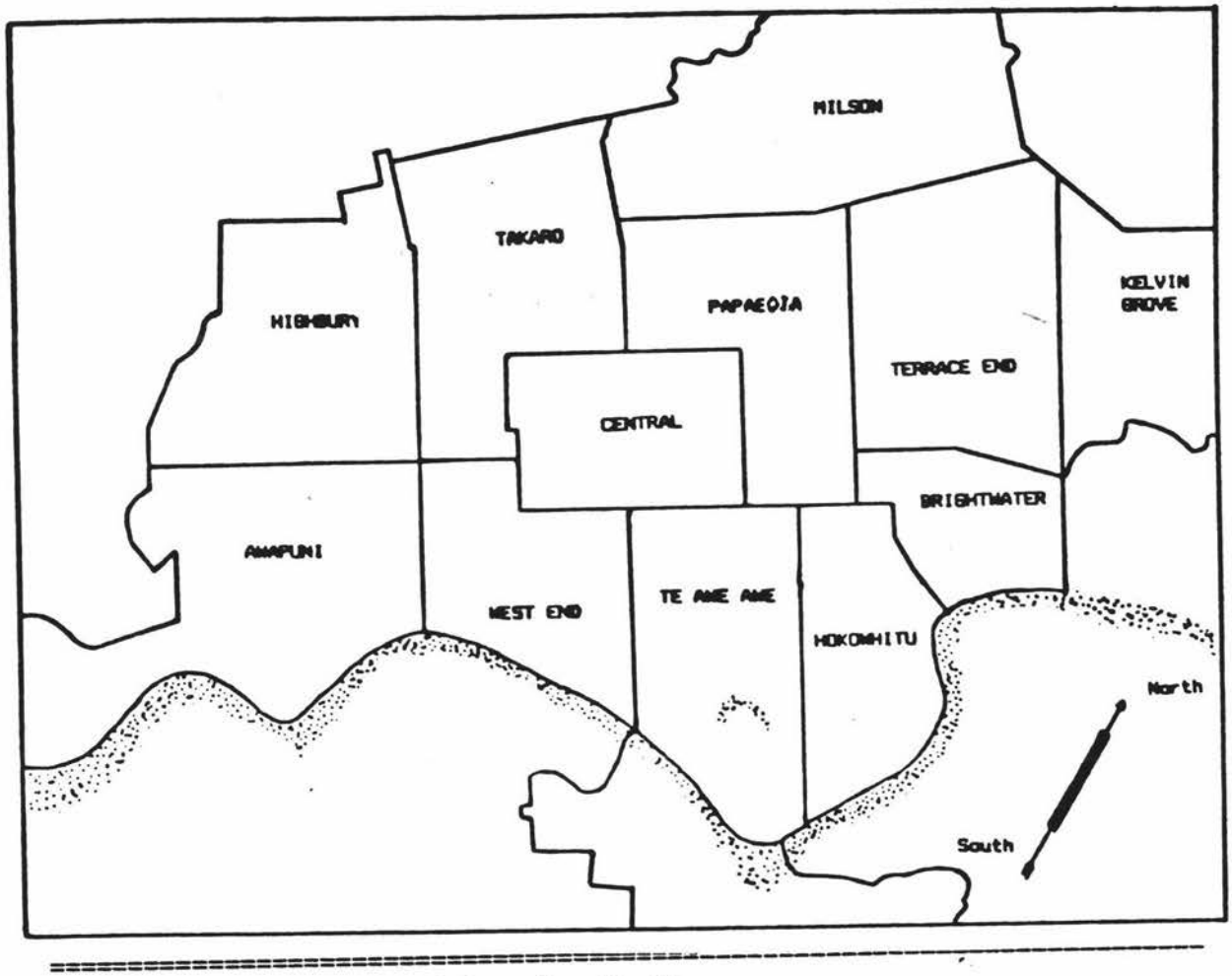


Figure 9.1 - Suburbs of Palmerston North
Source: Council Land Use Statistics
Year : 1974

Table 9.1 - Number of Palmerston North Households

Suburb	No. Households
Awapuni	2,145
Brightwater	944
Central	981
Highbury	1,320
Hokowhitu	1,482
Kelvin Grove	171 (*)
Milson	886
Papaeioa	1,906
Takaro	1,968
Te Awe Awe	1,813
Terrace End	1,689
West End	1,625
	16,930

(*) Estimated houses under construction still not inhabited at the time the survey took place.

N is the number of households

n is the sample size

d is the margin of error

α is the confidence interval where $Pr\ (|\bar{y} - \bar{Y}| \geq d) = \alpha$

$\bar{y}$ is the average of observations from a simple random sample and it is assumed to be normally distributed.

$\bar{Y}$ is the mean of the population

t is the abcissa of the normal curve that cuts off an area at the tails.

For large values of N, t is 1.96 for $\alpha = 0.05$, and 1.64 for $\alpha = 0.10$.

Values of n were calculated for various levels of d and α :

N = 16.930	t = ±1.96 α = 0.05	t = ±1.64 α = 0.10
d	n	n
0.05	375	265
0.06	263	185
0.063	237 *	167
0.07	194	136
0.10	95	

A sample size of 237 households results in a margin of error of ± 6.3% at 95% confidence level.

9.3 - Methodology

The population was stratified into the 12 suburbs mentioned; from each one several addresses were randomly selected to act as starting points. Clusters of 5 interviewees around 48 starting points were chosen at random from a map of the area. Data collection was carried out during and after working hours, so households with both partners working were represented in the sample. Instructions to the interviewer are attached as Appendix F and a copy of the questionnaire used in all interviews is shown in Appendix E.

9.4 - Objectives

The survey was intended to identify the consumer and to investigate consumer perceptions and preferences with reference to all types of wine available in the New Zealand market at the time.

The specific objectives of the survey were to identify:

a) Drinking population
b) Types of consumers
c) Consumer awareness
d) Consumer knowledge
e) Consumer attitudes towards wine
f) Consumer preferences
g) Consumption patterns
h) Changing patterns in consumption and preferences
i) Prospects for increase in demand
j) Correlation between level of consumption and consumers' socioeconomic status, age, level of education, family characteristics, etc.

9.5 - The questionnaire

The questionnaire was designed to meet the objectives outlined above (Appendix E) (Hyman and others 1954; Kahn and Cannell 1957; and Payne 1951). Consideration was given to the appropriateness of using open-ended questions in some instances (Politz 1953; and Sheatsley 1948).

The first questions of Section I of the questionnaire were to identify wine consumers, their drinking frequencies, their drinking scenarios and the different types of wines consumed by them. Questions 12 to 15 inclusive were related to preferences for different types of wine. Question 16 concerned availability of wines. Questions 17 to 19 inclusive established a detailed inventory of the wines that consumers had in storage at home. Questions 20 to 22 inclusive attempted to determine if consumption patterns were changing. Questions 23 to 25 were about the distribution on expenditure among different alcoholic beverages and also about changes in expenditure over a year period. Questions 26 and 27 referred to consumption in restaurants. Questions 28 and 29 were related to advertising and question 30 was about other beverages taken regularly by consumers.

Section II of the questionnaire determined household characteristics.

9.6 - Composition of the sample

A detailed composition of the sample is shown in Appendix G.

Comparing the composition of the households in the sample and the one obtained on a national basis in the census of 1971 (NZ Department of Statistics 1971), there appear to be certain differences in their distributions. In the survey sample the proportion of families without children is higher than in the national one (40% versus 32% at national level). On the other hand the proportion of families with only one child is lower in the survey sample than in the census (9% versus 18%). The distribution of families of two, three, four and five or more than five children, is similar in both samples, survey and national.

The sample covered a higher proportion of university educated people than the national census (19% versus 6.2% at national level). There was a lower percentage of people educated at secondary and primary levels (72% of the people from the sample had secondary education versus 77% nationally, and 9% had only primary education versus 16% at national level).

The proportion of people working in the different occupational groups listed in the New Zealand Official Yearbook from the 1971 census also differed from those in the sample. The proportion of "Agricultural " and "Production" workers is smaller in the sample than in the census, while the proportion of people in "Professional", "Technical", and "Administration" groups is higher (Appendix G).

9.7 - Analysis and interpretation of survey data

Detailed data is in Appendix H.

9.7.1 - Distribution of the sample

The distribution of the sample of 237 households was as follows:

142 respondents used wine either occasionally or regularly,
60 did not use wine at all, and
35 refused to answer.

The distribution of the sample in percentages is:

60% were wine users,
25.3% were non-wine users, and
14.7% were refusals.

The greatest proportion of refusals took place in the Takaro suburb, an area of low socioeconomic status. In general the people who refused to co-operate were elderly people.

Of the households that answered the questionnaire 70% were wine users and 30% were non-wine users.

9.7.2 - Wine users

The survey data had also been crosstabulated with several variables including suburban areas, age of community group, profession of heads of households, family income and other personal and family characteristics.

The crosstabulation of survey data with suburban areas was relevant in Palmerston North because there are city areas with clear demarcations between different socioeconomic groups.

Relating the number of wine users to suburban areas in Palmerston North, differences ranging from 50% to 100% of wine users had been observed. The lowest proportions of wine users were in the suburbs of Awapuni and Papaeoia, while the highest proportion was found in the Te Awe Awe suburb, which also had the highest proportion of professional and technical people living in the area [Table H.1(a)].

The population had been divided into three age groups. Of the group 18 to 30 years of age, 74% were wine users. The group from 30 to 64 years had a similar proportion of wine users (73%) while of those over 65 years of age 63% were wine users [Table H.1(b)].

It is significant to note that all of the respondents of European origin, with the exception of British people, were wine users. Non-users were New Zealanders, Australians, Americans and British. New Zealanders accounted for 84% of the total sample, 72% of them being wine users [Table H.1(c)].

There was also a high correlation between the level of education and habits of drinking. People with primary education only had the lowest proportion of wine users (41%). This group was predominantly over 50 years of age. Thus, age was another factor related to habits of drinking. Of the population with secondary education, 72% were wine users, and of the population with university degrees, 92% were wine users. Therefore, it can be said that in New Zealand the percentage of people using wine, as well as the amount of wine consumed, increases with the level of education [Table H.1(d)].

The occupation of the head of the household, which is related to the level of education, also influenced drinking patterns.

The data in Table H.1(e) show that the number of people who drink wine is greater among professional people and administrative and sales staff than among manual and agricultural workers (78% versus 57%).

The occupation of the household partner was not recorded, but respondents were asked whether or not the partner had a job. The group of households with working partners had exactly the same proportion of wine users as the group of households without working partners.

Of respondents in households with gross incomes of more than $12,000 (1975 NZ$) (Group C) 97% were wine users. Of households with annual gross earnings between $5,000 and $12,000, 70% were wine users (Group B). For the low income group only 64% were wine users [Table H.1(f)].

9.7.3 - Non-wine users - reasons and attitudes

Non-wine users were 30% of the respondent sample. This group mainly came from households with large numbers of minors. Respondents with four and five children showed the highest percentage of non-drinkers. The proportion of non-wine users decreased as the children's age became greater. Sixty six and a half per cent of non-wine users had children younger than 5 years of age, 26.5% had children between 5 and 15 years old and only 7% had children over 15 years of age [Tables H.2(a), H.2(b) and H.2(c)].

There were two differentiated groups of non-consumers: one formed of peo-

ple whose attitude against wine was dogmatic and not readily susceptible to change (37% of non-users and 11% of the total sample), and another formed by people whose reasons for not drinking wine were mainly the results of circumstances rather than an attitude of mind (63% of non-users). People of the latter group could be identified as potential users.

Of the first group, 10% did not drink wine because of their religious beliefs. This represented 3% of the total respondents. Of the non-wine users 16.5% were teetotallers because of their concern about the bad effects of alcohol upon the individual, and upon society as a whole. This figure represented 4% of the total sample. Health reasons accounted for 10% of non-users and 3% of the sample.

The respondents that fit into the category of potential users were the ones who, without having any strong feelings against wine, did not drink either because of their up-bringing, or for other economic and social reasons. Motives and percentages are listed in Table 9.2.

9.7.4 - Consumption patterns

Only 13% of the wine users drank wine once a day and it was usually a glass of sherry before dinner rather than a glass of table wine during meals. The distribution of frequency of wine consumption is as follows:

13% of the wine users drank wine once a day
33% of the wine users drank wine once a week
19.5% of the wine users drank wine once a month
34.5% of the wine users drank wine less than once a month.

Thus 65.5% of the wine users drank wine more often than once a month and 34.5% drank wine less often than once a month. People belonging to the first group could be considered to be regular users, and people belonging to the second group non-regular users.

People who used wine once a week consumed mainly still table wine and sparkling wine. People drinking wine each day consumed mainly cream sherry and sweet sherry [Table H.3].

Table 9.2 - Groups of non-wine users

Reason for not drinking wine	(% of total non-wine users)	
Religion	10	
Teetotallers	16.6	37
Health	10	
Family background	21.6	
Dislike	26.6	63
High price	8.6	
Not interested	6.6	

Table 9.3 - Drinking frequency at different occasions for regular wine users

	% of recorded responses
Before meals	16
With everyday meals	11
After meals	8.5
With guests	27
At parties	13.5
At celebrations	10.5
At hotels	1
At restaurants	11.5
Other places	1

People who use wine only once a month, or less often than once a month, were asked on which occasions did they drink. Most commonly this group of non-regular users drank wine at social celebrations, secondly in restaurants, thirdly with guests and fourthly at parties.

People who drank wine more often than once a month, did so during meals. They were asked how many times a month on average they drank wine in each of the different circumstances listed in Table 9.3.

Seven percent of the sample drank a glass of sherry each day before their evening meal, and the average for this type of user was each alternate day. Only 1% of the sample used still table wine each day with their evening meal. The number of times that respondents drank wine with their meals was spread over a wide range, but the general pattern within this group was 4 times a month.

The use of wine after meals was not a very common habit among wine drinkers, but still 8.5% of affirmative responses were recorded, with once a month the most frequent answer.

The sharing of wine with friends and guests was the most common occasion for regular wine usage. This was contrary to the patterns followed by the non-regular wine users, who most commonly drank at celebrations and special occasions. Fourteen percent of the sample shared wine with guests once a month, 8% twice a month and 5% four times a month.

The most common frequency of consumption at parties, celebrations and restaurants was "once a month". For this group of regular users the pattern was not to drink wine at hotels. Only 1% of the users drank wine in hotels once a month.

9.7.5 - Cooking habits

Sixty percent of the wine users included wine in their food cooked at home. Of these, 19% used wine for cooking at least once a week, 45% once a month, and the remaining 36% less often than once a month.

Forty percent of the wine users never used wine for cooking. These were

usually non-regular wine users.

The percentage of people using wine in their fruit salads was even smaller. Only 18% of wine users used wine in their desserts. Of these 16% used wine for this purpose once a week, 32% once a month and 52% less often than once a month [Table H.4]. Therefore the amount of wine used for this purpose was negligible. There appears to be considerable potential for increasing the consumption of wine through education of its uses in the kitchen, in sauces, flambees, and desserts for example.

9.7.6 - Types of wine consumed

Respondents were asked which wines they consumed among 9 types of table and dessert wines (Table 9.4).

A high percentage of users of still white and red table wines and dry sherry was found in the Te Awe Awe suburb [Table H.5]. The highest proportion of wine users was in the age group between 30 and 65 according to the survey. People over 65 drank more medium sherry and sweet sherry than any other type, while people under 30 drank more sparkling wine than any other type of wine [Table H.6]. Professional people showed a preference for still table wines and dry sherry, while production workers showed a preference for sparkling wine and cream sherry. Retired people and clerical workers mainly consumed sweet sherry [Table H.7].

9.7.7 - Consumer knowledge - Wine attributes

Questions concerning wine attributes were open, and answers were therefore varied and sometimes vague. They can, however, be grouped into two categories: objective or subjective answers. Subjective answers were very common and did not specify any particular characteristic or attribute of the wine. Answers to the question concerning reasons for using a particular type of wine were often statements such as, "Because I like it", "Because it suits my palate", or "Because friends like it". These kinds of answers were mainly given by respondents who had little knowledge of wine.

An attempt has been made to group the main answers given by respondents about wine attributes. The list is in Table 9.5.

Table 9.4 - Percentage of wine users for every type of wine

% of wine users	Types of wine
64	Sparkling wine
51	Still white table wine
49	Sweet and cream sherry
41.5	Still red table wine
37	Medium sherry
30	Rose
23	Dry sherry
10	Port
7	Madeira and Muscatel

Table 9.5 - Wine attributes

% of wine users	Reasons given
34	Subjective
12	liked to find distinctive flavour and character in the wine
8	liked table wine because it was suitable to drink with food
7	liked light and smooth wine
6	liked sweet wine
6	liked sparkling wine
4	liked wine with body
4	liked reasonably priced wines
3	liked wine suitable to drink on its own
2.5	liked dry wine
2.5	liked matured classical wines
2	liked medium wine (not too dry not too sweet)
2	liked still wines

The remaining 7% of respondents mentioned that they liked wine for its after effects such as relaxation, warmth, excitement, etc. Additional comments made by some respondents showed that a few had preferences for wine with a raspberry taste, or an apple taste, or other flavours rather than grapes, while others emphasised the importance of wine having bouquet and flavour of certain varieties of grapes. Some respondents liked wine diluted with water or lemonade.

9.7.8 - Consumer satisfaction with New Zealand wines

Consumer opinion appeared to be divided in this issue:

30% of wine users stated their preference for overseas wines,
42% of wine users found New Zealand wines satisfactory,
25% of wine users had no preference, and
3% of wine users did not know.

Reasons behind respondents' preference for New Zealand wines:

60% - price (New Zealand wine is cheaper than overseas wine).
13% - could not appreciate any difference. (They said that New Zealand wines are "just as nice" as overseas wines).
12% - loyalty to the country. (They felt that national industries should be helped by the consumer).
12% - lack of knowledge of overseas wines.
3% - could not say why they prefer New Zealand wines.

None of the reasons for preferring New Zealand wines takes into account the quality of the product.

Reasons behind respondents' preference for overseas wines:

51% - Quality (Overseas wines are of better quality and more mature than New Zealand wines).
18% - Taste (Distinctive flavour).
7% - Dryness (Overseas table wines are usually dryer than New Zealand wines).

The countries of origin of the wine preferred by the New Zealand consumers would depend on the range of wines imported from each country. A list of countries ranked by order of popularity is shown in Table 9.6.

9.7.9 - Consumer preferences

For the purpose of the study it was not relevant to specify brands and names of overseas wines. All overseas wines were classified as "imported" The preference shown by some respondents for overseas wines did not mean that they consumed more overseas wine than New Zealand wine. Respondents were asked brands and names of New Zealand wines of their preference for every type of wine. Brand preferences are shown in Figure 9.2.

9.7.9.1 - Sherry

Type preferred:

52% of sherry users liked sweet and cream sherry
35% of sherry users liked medium sherry
13% of sherry users liked dry sherry

Table 9.7 shows brand preferences for sherry.

Only half of the sherry users were able to recall the name or approximate name of the sherry preferred by them.

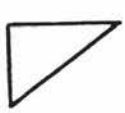
27% of the sherry users preferred Cream sherry,
16% " " " " " Sweet sherry,
4% " " " " " Palomino,
3% " " " " " Royal Reserve,
3% " " " " " Golden Sherry,
2% " " " " " Semi-sweet sherry,
1% " " " " " Cellar Blend,
1% " " " " " Amoroso,
1% " " " " " Flor Fino,

Attributes that people liked to find in sherries depended on preferences for sweet or dry. The respondents who preferred sweet sherry emphasised

	Sherry	White Table Wine	Red Table Wine	Rosé Wine	Sparkling Wine	Port	Madeira and Muscatel
Imported	II	I	I	I	I	I	
Babich	C (dry sherry)						
Corbans	B	II B	III B		II A	II C	
Cooks				III A			
Glenvale	III					III A	
McWilliams	I A	III A	II A	II B	B	B	A
Montana	C	C	C		III C		
Penfolds				C			
N.Z. Dept of Agriculture							B

I – Brand, first preference
II – Brand, second preference
III – Brand, third preference

Preference



A – Brand, most commonly held at home
B – Brand, second commonly held at home
C – Brand, third commonly held at home

Wine at home

Figure 9.2 – Brand preferences for different types of wine

Table 9.6 – Origin of wine preferred by consumers

Percentages *	Countries
20	Italy
20	Germany
16.5	Australia
15	France
12	Spain
9	South Africa
3	Portugal
3	Chile
1	USA

* (% of wine users who stated their preferences for overseas wines.)

Table 9.7 - Brand preferences for sherry

Percentage	Brand
24	McWilliams
15.5	"Imported"
11.5	Glenvale
10	Corbans
10	Villa Maria
6	Montana
5.5	Waihirere
4	Babich
4	Delegats
3	Penfolds
1	Vidal
1	Eastern Vineyards
1	Western Vineyards
1	Collards
2.5	All sorts of sherry and home made wines

Table 9.8 - Brand preferences for still white table wines

Percentages	Brand
25	"Imported"
22.5	Corbans
14	McWilliams
5.5	Montana
4	Mission
3	Cooks
3	Glenvale
3	Villa Maria
3	Wahirere

Table 9.9 - Brand preferences for still red table wines

Percentage	Brand
30	Imported wines
20	McWilliams
16	Corbans
6	Montana
4	Markovina
4	Cooks
20	Glenvale, Penfolds, Seppelts, S.Y.C. and other brands

the importance of smoothness and richness, while the respondents who preferred dry sherry gave more emphasis to flavour and taste as well as lightness of the wine.

Thirty percent of wine users expressed their dislike for fortified wines.

9.7.9.2 - Still white table wine

Fifty percent of wine users were consumers of still white table wines. Brand preferences in percentages are shown in Table 9.8

The remaining 17% was shared by Delegats, Markovina, Penfolds, Selaks, Seppelts and some home-made wine.

Seventy-three percent of the white wine users could recall the wine of their preferences. The rank of popularity from greatest to least was: Sauterne, Riesling, Cresta Dore, Hock, Liebestraum, Moselle, Chasselas and Dry White.

Attributes that people expected a white wine to have were lightness and clarity with a nice bouquet and flavour. Some respondents liked white wine more than any other type of wine because of its freshness and suitability for drinking chilled. Others mentioned that white wine was a good complement to fish dishes and cheese.

The main reason that non-white wine users had for not drinking it was that they had never tried it. This accounts for 37% of non-users of this type. Another 18% did not like it because it was still, and the rest did not like it for other reasons such as they felt it was too dry or acidic.

9.7.9.3 - Still red table wine

Only 35% of wine users stated their preference for red wine. Of the red wine users 82% could recall the names of the wines they usually drank.

The most popular names were Burgundy, Claret and Bakano followed by Dry Red, Pinotage, Cabernet-Sauvignon, Riverlea, Bragato, Burgina and Rossana. Table 9.9 shows brand preferences for still red table wine.

People thought that distinctive flavour and good palatability were qualities important for a good red wine. Not everyone had the same opinion about the fullness of the wine; some liked it light while others liked it with body. Nobody pointed out that red wine should be sweet. On the contrary the red wine users seemed to like it medium to dry. They thought it excellent with meat dishes when the wine was smooth and not tart.

Thirty-eight percent of the people who did not drink red wine said that this was because they never tried it. Some other respondents who tried it once or twice did not like it because they found it too dry for their palate, or it was not sparkling, was tart, or produced "hangovers".

9.7.9.4 - Rose wine

Twenty-one percent of wine users drank rose wine. Mateus Rose, imported from Portugal was favoured by 63% of the drinkers. Among New Zealand Roses the most appreciated was Spritzig from McWilliams. Cooks had a smaller share of the respondents' preferences for this type of wine. Corbans, Glenvale, Markovina, Mission and Montana were names also mentioned by several respondents (Table 9.10).

9.7.9.5 - Sparkling wine

Sparkling was preferred by people who drank wine only from time to time on very special occasions (41% of wine users). Imported sparkling wines were most popular, but there was a large consumption of local wines. "Cold Duck" from Montana was the most popular among non-connoisseurs. The second well-known one was "Liebestraum" from Corbans. "Premiere Cuvee" from Corbans and "Marque Vue" from McWilliams were next. Other names such as Crianza, Frascato Spumante, Sparkling Red, Pearl and Brut were mentioned by some respondents. Table 9.11 shows brand preferences for sparkling wine.

The reasons for preferring sparkling wine were varied including:

- no other type was known,
- sparkling was considered light, smooth, refreshing, cheap and bubbling,

Table 9.10 - Brand preferences for rose wine

Percentage	Brand
63	Imported wines
13	McWilliams
6.5	Cooks
3	Corbans
3	Glenvale
3	Mission
3	Montana
3	Markovina
3	Penfolds

Table 9.11 - Brand preferences for sparkling wine

Percentage	Brand
29	Imported wines
22	Corbans
20.5	Montana
8.5	McWilliams
8.5	Glenvale
5	Cooks
3.5	Seppelts
3.5	Penfolds
2	Waihirere
2	Granilla
2	All kinds

- sparkling wine was as nice to drink on its own as with food,
- friends liked it.

The reasons given for not liking this type of wine were:

- "fizzy drinks" were not liked,
- after effects of drinking sparkling wine were not desirable.

Only one respondent mentioned the poor quality of New Zealand sparkling wines.

9.7.9.6 - Port

Port was not a very popular type of wine among New Zealanders. Only 15% of the wine users consumed it. Port was too heavy and rich for some people, and others did not even know the existence of such a type of wine. Imported Port has the same popularity as Corbans Port. Glenvale was the third brand in order of preference and Mission was the 4th.

9.7.9.7 - Muscatel and Madeira

These are types of wines that were hardly known by New Zealanders. McWilliams Muscatel is the only national wine of this type that respondents knew and consumed.

Attributes that respondents liked to find in these wines were: flavour, body, richness and sweetness. These wines were considered good after meals and good for cooking and desserts.

The main reason for not consuming these wines was lack of knowledge about them and their possible usage. Twenty percent of wine users said they had never tried them.

9.7.10 - Purchasing patterns

The average monthly purchase of wine per household of consumers was 2 bottles and 3 to 4 flagons (Table 9.12 - Figures 9.3 and 9.4). If all households were to be included in the calculation, then the average pur-

Table 9.12 - Purchasing patterns (% of wine users)

	None	1-3	4-6	7-9	10 or more
Bottles per month	33	48	16	1.5	1.5
Flagons per month	72.5	24	3.5	-	-

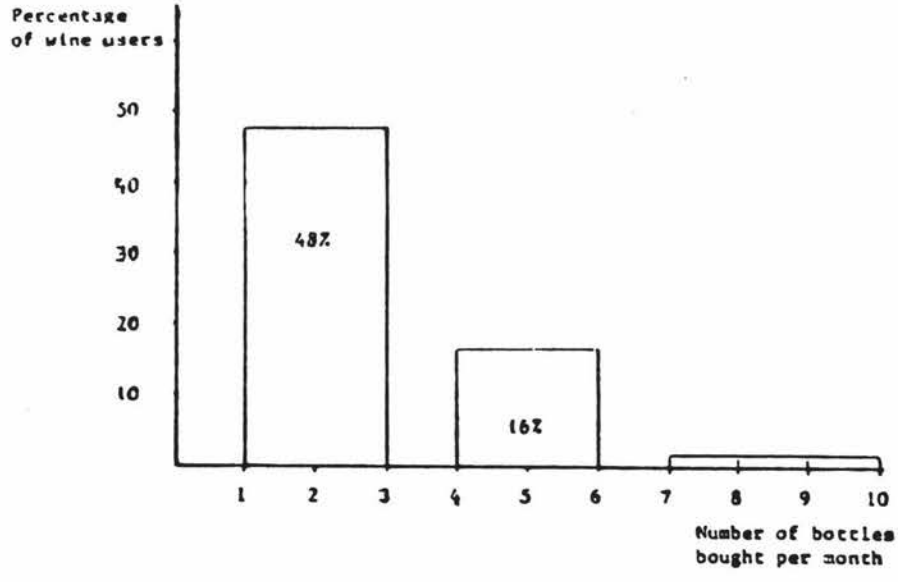


Figure 9.3 - Distribution of number of bottles bought per month

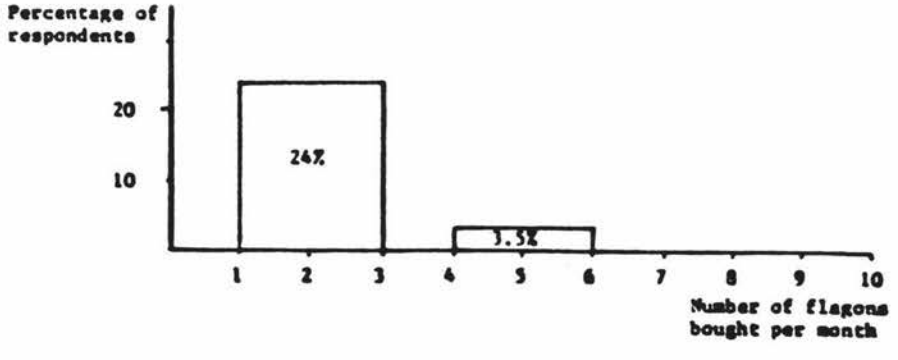


Figure 9.4 - Distribution of number of flagons bought per month

chase per household would be 1.5 bottles and half a flagon per month, amounting to about 2.5 litres bought per month or 30 litres per year. The total sales of wine for the year ending June 1974, from statistical sources, were 283,125 hectolitres, which, divided by the total number of households in the census, gives a figure very close to the one found in the survey.

Table 9.12 indicates that 19% of the wine drinkers are responsible for purchasing more than half of the total number of bottles bought by all wine consumers. In other words more than 50% of the amount purchased is bought, and presumably consumed, by one fifth of the population of wine consumers. This is a very important finding, which together with the information provided by the crosstabulation Tables H.9.(d), (e) and (f) helped to identify a particular group of consumers with similar socioeconomic characteristics, which is responsible for more than half of the total consumption of wine.

Eighty-two percent of wine users were not aware that advertising had any influence on their buying, while 12% admitted that it had some influence and 2% said that it had a great deal of influence. As for special offers, 75% never bought wine at reduced prices, 20% sometimes, 3% very often and 2% did not know.

9.7.11 - Expenditure on wine and other alcoholic drinks

Ninety-five respondents bought a total of 290 bottles and 100 flagons of wine in the month preceding the survey, for a total sum of approximately $660. Some respondents could not recall their monthly average expenditure on wine. The average expenditure among the respondents who could give this kind of information was $7 per month. The mode was $2 and the median $5. The average expenditure per household of wine users was therefore $5 per month.

The monthly household expenditure on alcoholic beverage is distributed as shown in Table 9.13.

Table 9.13 - Monthly average expenditure on alcoholic drinks

Percentage of wine users who responded	66%	59%	47%
	Wine	Beer	Spirits
Total expenditure	$660	$623	$484
Average per household	$ 7	$ 7.5	$ 7.2
Mode	$ 2	$ 5	$ 5
Median	$ 5	$ 5	$ 4.8
Maximum expenditure recalled	$ 30	$ 40	$ 40

Unit : 1975 NZ dollars

Table 9.14 - Changes in consumption over previous year

	Number of bottles per Month							
	Don't know	1	2	3	4	5	More	Total
No. of subjects consuming more wine	5	9	5	6	3	1	3	32
No. of bottles more	-	9	10	18	12	5	27	81
No. of subjects consuming less wine	8	4	7	5	3	-	-	27
No. of bottles less	-	4	14	15	12	-	-	45
Difference		+5	-4	+3	-	+5	+27	36

9.7.12 - Changes in consumption and expenditure

Changes in consumption are crucial to substantiating any prediction of future consumption trends and any claims of consumer resistance to price. Fifty-eight and a half percent of wine users did not change their consumption habits during the year previous to the survey and consumed the same amount of wine. The remaining 41.5% changed their drinking habits: 19% of wine users consumed less wine than in the previous year, and 22.5% consumed more. The balance, 3.5% of wine users, were in favour of increasing consumption, which represents 2.5% of the total sample.

The respondents were asked to quantify the change in consumption. The difference between the increase in consumption by some respondents and the reduction of consumption by some others was an increase of 36 bottles per month (Table 9.14), that is, 324 litres per year. On this basis the national annual increase would be approximately 1.3 million litres, less than half of the actual national increase in the past.

$$\text{Annual National increase} = \frac{\text{Number of households} * 324}{202}$$

324 = Litres per year of increased consumption
202 = Number of households who answered the questionnaire

Official figures for consumption which appeared after the completion of the survey corroborate this finding (Table A.8).

Forty-eight percent of wine users claimed that their expenditure on wine did not change. There is a difference of 5% between this figure and the consumption percentage, but some respondents pointed out that without changing consumption, their expenditure had increased because the price of wine went up during the previous year. Thirty percent of wine users increased their expenditure on wine and 22% decreased it.

9.7.13 - Consumption in restaurants

Eighty-one percent of wine drinkers consumed wine the last time they went to a licensed restaurant before the survey interview. Twelve percent did not drink wine and 7% could not remember.

Table 9.15 shows types of wines consumed in restaurants by respondents.

Brands served were, in order of preference; 44% of the respondents consumed "imported" wines, 20% Corbans, 16% McWilliams, 14% Montana and the remaining 6% consumed Cooks, Glenvale, Selaks and Waihirere.

In most restaurants the only brands which were available at the time of the survey were Corbans, McWilliams and Montana (Table H.8 shows percentages of types of wines by brands).

9.7.14 - Availability of wines

When respondents were questioned about availability of some New Zealand and overseas wines only, 20% admitted to having difficulties sometimes in obtaining particular wines. These people were aware of the fact that some wines were not easily available in the existing retail outlets.

The facts as seen by these respondents were that:

- Some wholesalers and retailers stored only a few brands, and did not have a whole range of brands and types for selection.
- Some wines, rewarded in wine competitions, never reached the market.
- Some restaurants did not have in stock all the wines in the list of the wine cards, and that very often the choice of New Zealand wines was very poor, usually limited to three brands.
- Some New Zealand wines could be bought only from vineyards.
- There were irregularities of supply of overseas wine and some of them were very hard to get.

These facts were noticed only by people who sought for a particular type of wine. Eighty percent of wine users selected their wines from those on the shelves of the wine sellers' premises.

9.7.15 - Types of wines and number of bottles at home

This is the most objective information obtained in the survey because it did not rely on people's memory or on their subjective evaluation. The interviewers themselves asked to see the bottles stored in the households

Table 9.15 - Consumption in restaurants

% of respondents	Types of wine served
37	Sparkling Wine
18	Still White Wine
14	Still Red Wine
8.5	Rose Wine
1	Sherry
21.5	could not remember

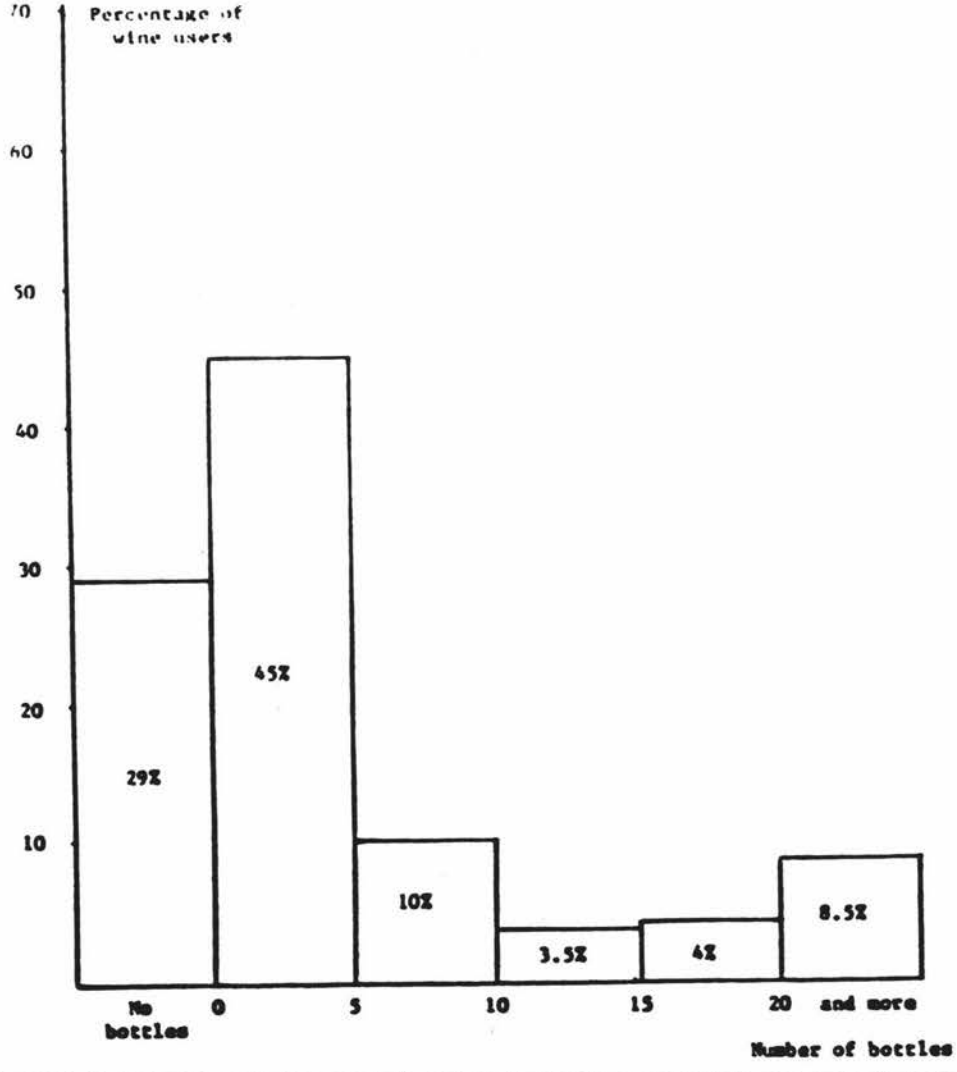


Figure 9.5 - Frequency distribution - No. of bottles of wine at home

they visited, and in 99% of the cases they found no objection to this. They could write down all the names and types of wine held by respondents. This provided valuable information about types of bottles stored, and the types of wines and brands favoured by Palmerston North households. Percentages of wine users who had wine at home was as follows:

71% of the wine users had bottles of wine at home
29% of the wine users did not have bottles of wine at home
32% of the wine users had flagons of wine at home
68% of the wine users did not have flagons of wine at home

The total number of bottles (New Zealand plus imported) in stock was 868, which would be equivalent to a total of about 70 thousand bottles in Palmerston North households. The frequency distribution is shown in Figure 9.5. Forty-five percent of wine users had less than 5 bottles at home at the time of the interview, and 30.5% had less than 5 flagons. Only 1.5% had more than 5 flagons at home.

Table H.9(a) shows that in Brightwater, Central, Highbury and Milson suburbs there were no households having more than 5 bottles in the home. Hokowhitu, Te Awe Awe and West End suburbs had some households with 15 to 20 bottles. Papaeoia, Te Awe Awe and West End had some households with more than 20 bottles. Table H.9(b) shows that people did not store large numbers of flagons at home. The most common pattern was one or two flagons, and the highest frequency was found in the suburb of West End.

Only 16% of wine users had more than 10 bottles in the house for the purpose of ageing some of them. Not many people at both extremes of the age groups had more than 5 bottles at home. Only people in the middle age group stocked a greater number of bottles [Table H.9(c)]

People with university degrees had the largest number of bottles in the house [Table H.9(d)]. The distribution of this group is as follows:

35% had more than 20 bottles
10% had 15-20 bottles
14% had 10-14 bottles
25% had less than 5 bottles

Eighty percent of the subgroups of respondents with secondary education had less than 5 bottles at home. They kept some bottles at home for having wine available rather than ageing it. Only 3% of the subgroups of respondents with primary education had some bottles of wine at home.

Professional people formed the subgroup with the highest frequencies in the clusters of largest number of bottles. Sales and production workers had the highest frequency for less than 5 bottles, and agricultural workers had the lowest of all [Table H.9(e)].

Comparing the different income groups the percentage distribution is shown in Table H.9(f) where the largest proportion of people having more than 20 bottles of wine at home were those of the highest income group. Table H.9(g) shows the number of bottles at home related to the number of children in the household but there is not a clear pattern of correlation between the two variables.

9.7.15.1 - Imported wines stored in New Zealand households

Twenty-seven percent of wine users had overseas wines at home. The highest frequency was for sparkling wine and the most common country of origin was Australia (Table 9.16).

Table wines were the main types of overseas wines that people kept, and the greatest number of bottles were of still white wine. The percentages of number of imported bottles found in households by types of wine are shown in Table 9.17.

The imported wines stored in New Zealand households came from the following countries by order of frequencies: Australia, Italy, Germany, Spain, South Africa, Portugal, France, Chile and the USA. This sequence differs slightly from the list of preferences where Italy and Germany were first and second preferred. Price and availability are responsible for this difference. Australian wines are generally cheaper and easier to obtain in New Zealand than European wines.

The total number of bottles from overseas stored in the households which were visited was 234, that is 27% of the total number of bottles stored.

Table 9.16 - Types of overseas wines present in New Zealand households

% of wine users	Imported Wines Types
15	Sparkling
13	Still Red wine
12	Still White Wine
5	Dry Sherry
4	Rose
3	Medium Sherry
2	Sweet Sherry
1.5	Port

Table 9.17 - Percentage of imported bottles by types of wines

% of wine users	Types of wine
20	Still White Wine
14	Still Red Wine
14	Rose Wine
18	Sparkling Wine
10	Sweet and Cream Sherry
2	Medium Sherry
12	Dry Sherry
5	Port
5	Madeira and Muscatel

Table 9.18 - Market's share of several New Zealand brands

Percentage	Brand
17	McWilliams
15.5	Corbans
11	Montana
7	Cooks
6	Villa Maria
5	Babich
5	Penfolds
4.5	Glenvale
4.5	Delegats
4	Mission

This is higher than the ratio of sales of overseas wines which was about 10% of total sales at the time of the survey. The average number of imported bottles per household with overseas wine was 6, the mode was 1 and the maximum number of imported bottles in one household was 27.

In Palmerston North there would be approximately 16,000 bottles of imported wines held in private homes.

9.7.15.2 - New Zealand wines stored at home

Sixty-three percent of wine users had a total of 634 bottles of New Zealand wine in storage, an average of 7 bottles per household of this subgroup. This represents an average of 4.5 bottles per household of wine users, and an average of 3 bottles per household. In Palmerston North this is equivalent to approximately 50,000 bottles of New Zealand wine stored in private homes. The "mode" coincides with the minimum which is one bottle. The maximum number of bottles of New Zealand wines found in a single household was 98.

The share of the home consumption market for several brands, all types of wine included, is shown in Table 9.18.

The remaining 20% of the home consumption market was distributed among the other brands listed in Table 9.19.

The brands present in Palmerston North households in percentages based on the number of bottles for every different type of wine are shown in Table 9.19. Figure 9.2 compares the main brands with previously stated preferences.

9.7.16 - Beverages consumed daily

Beverages consumed by adult respondents are listed in Table 9.20.

Table 9.19 - Brands present in Palmerston North households based on the number of bottles for each type (%)

	Table Wines				Dessert Wines				
					Sherry				
	White	Red	Rosé	Sparkling	Dry	Medium	Sweet	Port	Medium Muscatel
Babich	5	5	2	2	11.5	6.5	5	7.5	
Collards	0.5					1			
Cooks	7	8.5	2	8	7.5	7	3.5	6	12.5
Corbans	15	14.5	26.5	24.5	11.5	15.5	15	10.5	4
Delegats	3	4	4.5	3.5	2	5.5	6	6	
Glenvale	2	2.5	4.5	6		3	3.5	13.5	8
Golden	0.5								
Himitangi		0.5			2		1		
Home-Made	0.5				2		2.5		
Hawkes Bay	1.5	2	2		4	2.5			
McDonalds	0.5	0.5	2			1.5			
McLeod	1.5	1		2					
McWilliams	16.5	18	19	16	2.1	18.5	16.5	12	21
Markorina	4	3	4.5			1.5	1	1.5	4
Mission	4	3	4.5	2	6	3	2	3	
Montana	11	11.5		10.5	9.5	10	14	12	16.5
N.Z. Ag. Dept.	1.5	1	2			2.5	2	6	16.5
Nobilo	2.5	2		2					
Penfolds	5	6	9	2	2	6.5	3.5	4.5	4
San Marino	1	1							
Selaks	2.5	3		1	6	1	1		
Seppelts	2.5	2.5	4.5	3.5	2	3	2	3	4
Syes	2		4.5	2	4	1.5	3.5	3	
Vidal	1.5	2		1	2				
Villa Maria	5	6	4.5	9.5	4	5.5	8	6	4
Waihirere	2.5	2.5		1	4	1.5	4	3	4
Western	1	0.3	4.5	1		1.5	1	1.5	
	100	100	100	100	100	100	100	100	100

Table 9.20 - Beverages consumed each day

% of adult population	Beverage
81%	tea
70%	coffee
35%	milk
29%	fruit juice
12%	beer
11%	spirits
10%	soft drinks
8%	wine
8%	other kind of beverages

9.8 - Summary of findings

9.8.1 - Consumer typology

The results from a survey of a randomly selected sample showed that 70% of the adult population were consumers of wine and that the remaining 30% did not consume wine at all. Only 32% of the adult population drank wine on a regular basis, while 38% used wine occasionally.

Regular wine drinkers belong to a clearly defined socioeconomic group, mainly of people with higher levels of education. A high percentage of regular wine consumers was found among professional people, salesmen and administrative staff (92% of people in the sample who had a university education were regular users). On the other hand, the lowest percentage of regular wine consumers was found among manual and agricultural workers.

The population was also divided into three age groups and except for the over-65 age group, patterns of consumption were not significantly different between the other two groups of the population.

The sample was stratified into three income groups. The highest income group contained 97% of wine users while the group of households belonging to the lowest income group had only 64% of wine users. Of the middle income group, 57% of the households in the sample, 70% were wine users.

It was concluded that people in high income brackets and/or with a high level of education formed the majority of regular wine users with the highest level of consumption.

Non-wine users came mainly from households with a large number of minors. Families with four or five small children contained the highest percentage of non-drinkers. Two clearly differentiated sub-groups emerged from the group of non-consumers: one containing those whose attitude towards wine was totally negative and non-permissive (37% of non-consumers); and another of people whose reasons for not using wine were the results of circumstances rather than an attitude of mind (64% of non-consumers). People in this sub-group could be potential users.

9.8.2 - Consumer knowledge

The majority of respondents had very little knowledge about wine. They usually had little information about the wines they consumed and some knew very few wines. At the time of the survey more than 50% of the wine users did not consume table wines at all. Of them 38% had never tried either white or red still table wines.

There were considerable differences between the knowledge that some of the regular users had about wine and the knowledge (or lack of it) of the group of non-regular consumers.

"Quality" was a word which was not often mentioned by the group of non-regular users and generally this group of consumers did not appear to be concerned about quality, maturity, or any other attributes of wine.

9.8.3 - Consumption and buying patterns

Regular wine users usually consumed still table wine (either white or red) with their evening meal about once a week. Non-regular users consumed mostly sparkling wines and sweet sherries, the first often offered at parties or special celebrations and the second most commonly used in the home.

The average monthly purchase of wine was around 3 litres per household of wine users, or 2.5 litres per household while the average monthly expenditure on wine was around $7 (1975 value) per household.

A group of regular consumers of similar socioeconomic status, responsible for more than half of the total wine consumption, was identified.

9.8.4 - Changing patterns in consumption

An important piece of information from the survey concerned changes in consumption. Twenty-two percent of wine users increased their consumption and 19% of wine users decreased it, compared with the previous year. Extrapolating to a national level, the total increase in consumption for the year 1975 was less than half the annual increase during previous

years. Therefore, other things being equal, it was to be expected that increases in consumption would reduce, and that projections of future demand based on past trends were too optimistic. The slower increase in consumption was mainly due to a price factor. It is possible to conclude that the price of wine had reached the threshold of consumer resistance and had persisted at that level ever since. Statistical figures (Table A-9 - Appendix A) show that in the year 1974 there was actually a decrease of consumption per capita of 8%. In the year 1975 there was an increase of only 2% and in the following years there has been an annual average increase of about 5%, while in the early 1970's the annual average increases in consumption of wine per capita were about 15%.

9.8.5 - Consumer preferences

Consumers were asked to establish their preferences for either New Zealand or overseas wines and then rank their brand preferences for every type of wine. The results are summarised in Table 9.2. Consumers appeared to be divided in their preferences for local or overseas wines. Thirty percent of wine users stated their preferences for overseas wines, while 42% found New Zealand wines satisfactory and 25% had no preference. It appeared that price was a relevant factor for 60% of consumers who preferred New Zealand wines. It also appeared that quality was a relevant factor for more than 50% of consumers who stated a preference for overseas wines.

Brand preferences for New Zealand wines at the time of the survey showed that McWilliams was most popular followed by Corbans and Montana. McWilliams was also the brand that was found most often in surveyed households.

9.8.6 - Consumer satisfaction

Overall the non-sophisticated New Zealand consumer was quite satisfied with what he/she was getting from the New Zealand market. The New Zealand consumer considered wine more as a luxury item than as a normal commodity. Sweet and sparkling wines were preferred by this group of consumers.

Some respondents among the groups of regular consumers were concerned about wine prices, which deterred them from increasing their consumption and from trying new wines (mainly from classical varieties) appearing in the market.

Of the 42% of wine users who found New Zealand wines satisfactory, 60% took price as a measure of comparison to favour New Zealand wines, 13% could not appreciate any difference in quality, 12% felt that national industries should be encouraged and helped by the consumer, and 12% had lack of knowledge of any other wines different from New Zealand wines.

In addition to that, if the group of 25% of wine users who had no strong preferences is taken into consideration, it can be concluded that the requirements of 67% of consumers were partially met by New Zealand products. However, price appeared to be a deterrent against increased consumption and certainly a deterrent to trying imported products. It can be argued that under those circumstances the consumer was deprived of choice by the lack of competition although the average consumer might not have been aware of it.

Thirty percent of regular wine users were neither satisfied with the quality of New Zealand wines, (although acknowledging that it was improving) nor with prices of local wines. Dissatisfaction was also expressed about escalating prices and reduced availability of imported wines.

To summarise, the survey identified three main types of consumers or potential consumers of wine: a sub-group of non-users, non-regular users and regular users. Increases in demand can occur through changes in these three areas: some current non-users can become consumers, non-regular users can become regular users and regular users can also increase their consumption. However, price seems to be a deterrent to the progression of consumers from one group to another.

The survey also identified different needs for differentiated types of consumers. The needs of the non-connoisseur were apparently met by products currently available. However, their wine consumption was small compared with that of regular users. The regular wine users were responsible

for more than half of the total wine consumption. Data from the survey did not provide enough basis for an in-depth analysis of the preferences and perceptions of this consumer group. Since they consume the greatest proportion of the total wine produced in this country, it was thought important to know more about how products in the market were perceived by this group of regular users and to learn more about their preferences. It is also relevant to investigate the extent to which the needs of this group were being met by the products available in the market.

CHAPTER 10

MULTIDIMENSIONAL SCALING - THEORETICAL BACKGROUND

10.0 - Introduction

Multidimensional scaling is a relatively new technique used for analysing behavioural data in a variety of disciplines, such as psychology, sociology, political science and marketing research.

The underlying theories were originally formulated in behavioural sciences almost 40 years ago, and were based on fully metric approaches. Important contributions were made by psychometricians like Torgerson (1952), Guttman (1944) and Coombs (1950). Since the publication of Shepard's paper (1962) with the first computer-based procedure for non-metric analysis, the scope of multidimensional scaling has greatly increased, new methodology has been developed, and increasing numbers of researchers in different fields are experimenting with these procedures.

10.1 - Theory

Any object can be represented as points positioned somewhere in a space. A geometrical model can visualise relations among these points in such a way that the interpoint distances correspond to similarities of the objects represented by them. The ordering or matching of distances between pairs of points leads to the construction of a spatial model. Originally, the geometric space involved only a one dimensional scale, but recent developments have extended scaling methodology to handle higher dimensional space.

Behavioural data can be represented, therefore, in a configuration as relations of points in a geometric multidimensional space. The intrinsic properties of goods are not as important as what consumers believe they are and the way they react towards them. Lancaster (1966:132) stated that "goods are what are thought as goods". Physical objects do not necessarily agree with perceived objects, and marketing research is concerned with the perceived objects as well as their relationship to the physical ones. Perceptions and preferences are two important factors of

all human behaviour. Multidimensional scaling seems to be an appropriate technique to use for analysing perceptional data, since, as defined by Green and Carmone (1972), it is the spatial representation of the relationship among behavioural data based upon perceptions and preferences.

10.2 - Applications

Application of the technique can be found in several scientific and business fields. In recent years multidimensional scaling methods have played an important part in analysing consumer behaviour. An intensive investigation of the applicability of multidimensional scaling techniques to marketing analysis has been under way at the Wharton School of Finance and Commerce (Green and Rao 1972) at both pilot and field data levels. More recently multidimensional scaling has become a major tool in the development of various conceptual models of multiattribute decision making (Green, Maheshwari and Rao 1969).

Green and Carmone (1972) considered that there are seven major areas of marketing application:

a) Product life-cycle analysis
   Brands can be represented as points in a multidimensional space at a specific point of time or through a period of time.

b) Market segmentation
   A market segment might be viewed as a subspace. Johnson (1971:13) stated that "market segmentation analysis refers to examination of the structure of a market as perceived by consumers, preferably using a geometric spatial model, and to forecasting the intensity of demand for a potential product positioned anywhere in the space".

c) Vendor evaluation
   Evaluation functions are empirical estimations of weights that people use considering different alternatives.

d) Advertising evaluation
   Non-metric methodology might be useful in the question of selection strategy.

e) Test marketing

Multidimensional scaling methods may be employed both as guides to research and development of new products and in the prediction of market share of new entrants.

f) Salesman and store image

The technique could be applicable in that area of perception of images in a manner similar to that for brands.

g) Brand switching research

Similarities and preferences analysis can be applied to learn how the perception of products can affect the switching of brands or the patterns of brands' loyalty.

Multidimensional scaling is being used in the USA for the design of new products. Some consulting firms are offering scaling services to determine the buyers' perception and preferences and for testing of acceptance of new drinks. Johnson (1971) has used it for the analysis of existing brands of beer.

Morgan and Purnell (1969) suggested that the "holes" or "gaps" in the configuration space can be identified with lacunae in the market that can have potential for new product development, principally if ideal points are located in or near these groups.

Anderson (1975) believed that the most serious drawback of existing models (even the most sophisticated ones proposed by Shocker and Srinivosan - 1974) is that they are more diagnostic than predictive, due to the inability to relate psychological response to products physical attributes.

The scope for marketing application has been emphasised by several other authors. Green (1975) and Wentz (1972) stated that the technique can be very useful in the analysis of behavioural data where perceptions and preference judgements determine the patterns of behaviour. Wentz (1972) foresaw four uses of behavioural analysis:

1) To discover psychogenic drives that may play a significant role in the behavioural process associated with a particular brand or product.

2) To discover the pattern of purchase process, i.e., to investigate the sequence of events leading to the eventual acceptance or rejection of a product.

3) To search out attitudes that encourage or prevent the purchase of particular products or brands, or that encourage acceptance of particular promotional messages.

4) To look for consumer needs that are not satisfied by present products.

10.3 - Types of multidimensional scaling

There are three types of multidimensional scaling. These are (Green and Carmone 1972):

a) Fully metric methods. (These require ratio-scaled distances, but in practice only interval scale values are used).
b) Fully non-metric methods. (These require a rank order of the input. They, therefore, do not obtain the configuration of points, but only the rank order of the objects' projections on each dimension in turn).
c) Non-metric multidimensional methods. (These combine the best of both previous approaches, ordinal input and metric output).

10.4 - Limitations and difficulties

The limitations of the technique are weighted depending on the objectives of those who are using this research tool. A psychologist would be more concerned about the processes of judgements of similarities and preferences and the special difficulties of transferring perceptions into rank orders and ratio scales (Gregson 1975), while statisticians would be more concerned with the computational problems such as possible "degeneracy" of configurations, "robustness" of solutions, "noisy" data, and "missing" values.

Conceptual and computational problems do exist, and the fact is that relatively little is known about how subjects combine differences in pairs of stimuli so as to give an overall similarity or preference judgement. Laboratory experiments carried out by Torgerson (1965) indicated that different subjects may adopt different criteria in assessing overall similarity. Also very little is known about how unique are the attribute spaces given noisy and/or missing data and the statistical reliability of the solutions (Aaker 1971).

Several difficulties, such as aggregation of data, choice of dimensionality, identification and labelling of axes and meaning of "holes" in the spatial representation, can be encountered with the application of multidimensional scaling.

10.5 - Advantages

In spite of the limitations and difficulties mentioned above, the technique is gaining acceptance and being widely used in behavioural science as well as marketing research. This is principally because the method has advantages of producing visual representation of items/objects/stimuli in a geometric space with a metric scale from non-metric data.

Ideal points based on individual preferences can be plotted in the same map of stimuli, representing the most preferred combination of attributes above any other combination.

A vector model can be fitted in the same space representing either subjects (unfolding analysis), or bipolar scales of different attributes of the items under study.

10.6 - Alternative approaches

Different conceptual and computational approaches can be identified from the literature. These include:

- direct similarity measures versus derived similarity measures,
- consonance relations of data versus dominance relations of data,
- ratio scales versus rank order,

- metric analysis versus non-metric analysis,
- internal analysis of preferences versus external analysis, and
- individual differences versus aggregate scaling.

This classification is by no means exhaustive. Selection of appropriate alternatives would depend on the objectives of the study and will be described in the following chapter, but first a brief comment will be made on each of the alternatives.

10.6.1 - Direct versus derived similarities

Direct judgement similarity scaling does not confine the response to any given set of attributes, although sometimes, in order to ensure more homogeneous criteria among respondents, the judgements of similarities or dissimilarities are based on the concept of object substitution. In pair by pair comparisons, "similar" means that a particular object could be substituted by another.

Derived measures of similarities are based on judgements upon pre-specified sets of attributes by the researcher. These ranking judgements can be useful in the interpretation of the configuration developed from direct judgements (Green and Rao 1972).

10.6.2 - Consonance versus dominance data

In the case of consonance data, judgements are made on the basis of similarities or differences between each pair of items, while in the case of dominance data judgements are made on the basis of the higher or lower level of some attribute for each pair of items.

10.6.3 - Ratio scales versus rank order

There are more than these two alternatives for ordering the data. The three basic types of scales are: ordinal, interval and ratio. Some authors, such as Stevens (1958) also include nominal classification as a type of scale. Ordinally scaled data are based on the ordering of objects or concepts according to some criteria. An object can have more or less of a property than another object or be equal to it. Ratio and interval

scales are two different types of metric scales, but multidimensional scaling has focused more attention on "hybrid" scales that fall between ordinal and interval. Coombs (1964) and Bennett and Hays (1960) developed the methods that require ordinal input data and yield non-metric output. Siegel (1956) developed a method where the ranking of pairs of preferences yielded a "higher - ordered metric". The sources of these methods are drawn from the hypothesis that a person's sense of utility is stronger than his/her sense of ordinality. Siegel (1956) stated that, since a simple ranking order indicates nothing about the "non-orderable" relations, this method is based on relations of pairs of probability combination, which contain the necessary information to change an ordinal scale to a "higher-ordered" metric scale.

10.6.4 - Metric analysis versus non-metric analysis

Some of the alternative approaches that have been previously mentioned cannot be taken separately for they are interrelated. Fully metric methods require ratio-scaled distances and fully non-metric methods, known as "unfolding methods", yield non-metric output.

Non-metric multidimensional scaling methods combine rank order inputs and metric solution. Shepard provided the first computer algorithm to finding a configuration whose rank order of (ratio-scaled) distances best reproduced the original rank order of the input data (Shepard, Romney and Nerlove 1972).

10.6.5 - Internal versus external analysis

Internal analysis is based on preference data alone. It is possible to generate a configuration from preference data by a variety of factor analytic procedures, but in this case differences in perception and differences in preferences cannot be analysed separately.

External analysis is preferable since it is based on similarity data which is purely perceptional and not admixed with personal preferences.

10.6.6 - Aggregate versus disaggregate analysis

Both types of analysis can be used in multidimensional scaling. The use of one or the other would depend on whether the researcher's objective is to compare individual differences or to make some aggregation of subjects with certain homogeneity of either perceptions or characteristics.

10.7 - Computational aspects

10.7.1 - Index of fit

Kruskal (1964) proposed an index of fit, called "stress" measure, that represents the similarity/proximity between points in a space and the input data rank. The "stress" formula is:

$$S = \sqrt{\sum_{i \neq j} (d_{ij} - \hat{d}_{ij})^2 \; / \; \sum_{i \neq j} d_{ij}^2}$$ (known as stress formula 1)

δ_{ij} = original input data of dissimilarities between pairs of objects i and j (it is assumed that dissimilarities can be rank-ordered)

d_{ij} = computed distances between all pairs of points in the configuration

$\hat{d}_{ij}$ = set of numerical values, chosen to be as close to their respective d_{ij} as possible, subject to being monotone with the original δ_{ij}

Some other versions of the formula have $\sum_{i \neq j} (d_{ij} - d)^2$ in the denominator, where d is the average of d_{ij} values (this is known as stress formula 2) (Green and Rao 1972).

If $d_{ij} = \hat{d}_{ij}$, the index of fit is zero. When S = 0, indicates a perfect fit. High stress values mean that monotonic fit is poor.

Kruskal (1964) proposed the following descriptors for various levels of stress values:

S = 0.025 ——— excellent
S = 0.050 ——— good
S = 0.100 ——— fair
S = 0.200 ——— poor

Young (1968) related the value of stress to the number of points and indicated that when the number of points increases the value of the stress increases too, even in cases where his proposed measure of "metric determinacy" showed an improvement. He concluded that stress as a measure of goodness of fit should be taken cautiously and is acceptable only as a descriptive statistic.

10.7.2 - Improving the configuration

Most of the computer programmes adopted for non-metric scaling have routines for moving the points while searching for a better configuration whose ranks of interpoint distances are more closely monotone to the original input data until they reach the minimum stress value.

The procedure can be summarised as involving the following steps (Green and Carmone 1972, Green and Tull 1970):

a) The initial configuration can be selected randomly or obtained by factor analytic methods.

b) Computation of $\hat{d}_{ij}$ and d_{ij}.

c) Evaluation of the fit measure S.

d) Usually the programmes have a stopping value ε.
When $S > \varepsilon$ a new configuration is tried.

e) Repeat the process until S is reduced to a satisfactory level.

KYST (the computer programme being used in the present study) (Kruskal, Young and Seery 1973) finds the configuration of minimum stress by using an iterative procedure (of the "steepest descent" type) which starts with an initial configuration and keeps modifying it until it converges to the configuration of minimum stress.

10.8 - Data collection methods

Conceptual and computational aspects of the technique have been outlined

but some of the empirical problems surrounding the application of the technique have still to be discussed. One of these problems concerns the choice of the appropriate procedure for data collection. Green and Carmone (1972) classified the different procedures for collecting similarity data.

The collection of data chosen for the present study has involved three different steps:

1) Direct similarity judgements - Disjoint alternative
   Respondents were asked to rate each pair of stimuli on a 7 point similarity/dissimilarity scale.

2) Derived similarity judgements
   Respondents were asked to rate each stimulus on a 7 point attribute scale for 10 different attributes.

3) Preference rankings
   Respondents were asked to rank each stimulus in order of personal preferences, including overall preferences and other preferences in different scenarios.

The disjoint alternative of comparison of all possible pairs is only practical when the number of objects is relatively small. The number of all possible combinations of pairs is:

$$C_n^2 = n! / 2![n - 2]!$$

If the number of combinations becomes too high this alternative is not feasible in practice.

Other alternatives such as conjoint data collection methods can be used for a larger number of stimuli. This reduces the comparison task because the stimuli are grouped into clusters and transitivity among stimuli of the same cluster is assumed.

10.9 - Optimal dimensionality and interpretation of axes

The number of dimension is in fact limited by the number of points. This is because the number of parameters needs to be considerably less than

the number of observations for a meaningful recovery. Sherman (1972) suggested a minimum of 5 objects for a 1-dimensional solution, 9 objects for a 2-dimensional solution and 13 objects for a 3-dimensional one. Shepard, Romney and Nerlove (1972) gave four criteria for the choice of dimensionality:

1) The relation between the number of dimensions and the stress should not change too drastically for the addition of new dimensions. The curve should look like an "elbow" that first descends steeply towards the optimal dimension and declines slowly thereafter.

2) The representation should be statistically reliable.

3) The representation should be interpretable.

4) The representation should be easily visualized, and so confined to two or at most three spatial dimensions.

Other authors do not agree with Shepard's point of view. Fenker and Evans (1971) suggested that the concept of psychological space should be accepted as a useful behavioural construct independent of whether or not the dimensions have clear-cut physical interpretations.

Methods to provide a quantitative measure to determine the underlying dimensionality have been developed. Although none of them provides automatic criteria they can be used as useful indicators in the search for the optimal solution.

The interpretation and labelling of the axes is usually done subjectively. Sometimes points along the axis can be correlated with physical properties of the objects.

In the present study an attempt is made to interpret the configuration through the derived measures of similarities obtained from the respondents and based on judgements upon pre-specified sets of attributes.

This leads to a vectorial model where each one of the vectors corresponds to a different attribute of the objects. This vectorial model can be

plotted on to the external configuration of points from direct similarity judgements. This helps to recognise some perceptual dimensions making the interpretation and labelling of the axes a more objective task than in some other examples in the literature.

10.10 - The concept of the ideal point

Points in a geometrical space can represent not only objects, but also subjects in the same common space. A "person point" is a hypothetical representation of the most preferred combination of all the items judged by that person. It is called his or her ideal point. An ideal point taken from an aggregate of subjects would represent the hypothetical aggregate that coincides with the combination of scores most preferred for the group of subjects over all the other possible combinations.

A fully non-metric version was suggested by Bennett and Hays (1960) and a fully metric version was proposed by Schonemann (1970) for the location of ideal points. However, the most important advances have been made in non-metric methods by Kruskal and Carmone (1969) and Roskam (1968).

Carroll and Chang (1964) have related preference data to multidimensional solutions, so that the squared Euclidean distances from each stimulus are linearly or monotonically related to the preferences expressed by the subject.

The PREFMAP2 computer programme can enter the preference data in a given configuration derived from external analysis of similarity data.

10.11 - Alternative computer-based algorithms for multidimensional scaling

Since the publication of Shepard's paper (1962) a large number of alternative algorithms have appeared for the application of multidimensional scaling. Some versions are purely metric, others involve metric and non-metric methods, some are applicable to similarity data, some others to preference data, while a few versions can cope with more than one category of data.

The programmes most commonly used are M-D-SCAL V, PREFMAP, INDSCAL, and

TORSCA 8 and 9. These programmes are applicable to different types of input data. Other important programmes are Guttman and Lingoes SSA series, McGee EMD, CEMD-DEMD, Roskam's MINI programmes, De Leeuw's NMSPOM and KYST.

KYST is a merger of M-D-SCAL V and TORSCA-9 including the best features of both. It uses the initial configuration procedure of TORSCA-9 as well as the practice of rotating solutions to principal components and incorporates the generality and the input procedure of M-D-SCAL V. The name KYST is formed with the initials of Kruskal, Young, Shepard and Torgerson.

The programmes used in the present research were KYST for the analysis and processing of direct similarity data and PREFMAP2 for the analysis and processing of derived similarity data and preference data.

KYST places "n" points in a space of one or several dimensions where the stress between the configuration of points and the data is minimum. KYST can use up to 50 iterations moving all points to decrease the stress, until the stopping criteria are reached. It has two optional stress formulae that often yield very similar configurations (Section 10.7.1).

$$\text{STRESS} = \frac{\sum_{M=1}^{MM} [\text{DIST}(M) - \text{DHAT}(M)]^2}{\sum_{M=1}^{MM} [\text{DIST}(M) - d_o]^2}$$

where:

DIST (M) = values of the distances between pairs of points

DHAT (M) = values of the regression functions

d_o = 0 for stress formula 1,

d_o = arithmetic average of DIST (M) values for stress formula 2,

Formula 1 is the general formula for calculating stress and formula 2 is to be used for unfolding analysis. The interpretation of stress values varies depending on the number of stimuli and number of dimensions.

Normally KYST uses the Minkowsky r-metric distance formula which is appropriate for Euclidean space:

$$\text{distance}_r\ (x,y) = \left(\sum_i (x_i - y_i)^r\right)^{1/r}$$

when r = 2, the distance is the ordinary Euclidean space and when r = 1, the distance is the city block distance or Manhattan metric.

An important function that KYST has is not specified in the instruction manual. Since KYST is meant to be an improved version of M-D-SCAL and TORSCA 9, perhaps it is implied that KYST can also perform the function of aggregating data of different subjects in a kind of average space configuration. In fact KYST does aggregate data as has been proved by the successful running of the programme for that purpose in the present research study. How to make the programme aggregate data is specified in the section which deals with input KYST control cards (Appendix I)

PREFMAP2 is a revised version of PREMAP (Code file MAPREF at Massey). The main improvement of PREFMAP2 is that the stimulus space can be obtained externally, as in MAPREF, as well as generated internally from the preference data itself. Other improvements lie in the procedures for rotation and/or weighting of coordinates of the stimulus space (called sometimes canonical rotation and canonical weighting).

PREFMAP2 consists of 4 phases corresponding to 4 models:

Phase 1 - Idiosyncratic rotation and differential axis weighting (each individual is allowed his own orientation and weighting of dimensions).

Phase 2 - Idiosyncratic differential axis weighting in rotated space of average subject (allows each individual differential weighting of dimensions only).

Phase 3 - Ideal point model with equal axis weighting in rotated and stretched space of average subject (all subjects are assumed to have the same orientation and weighting of dimensions).

Phase 4 - Vector model in rotated and stretched space of average subject (the linear correlation between the preference scales data and the projections of the stimulus points on the fitted vector is maximised).

Green and Rao (1972:113), stated that "relatively little appears to be gained by going beyond the simple (equal-axis weighting) ideal-point model in the rotated and differentially stretched space of the average subject". It seems therefore adequate to suppose that the preference data of most subjects can be fitted reasonably well by either the simple ideal-point (Phase 3) or vector model (Phase 4) with no need for idiosyncratic axis rotation (Phase 1) or differential stretching of the average subject (Phase 2).

The input data has to be in the form of a subjects-by-stimuli matrix. The maximum number of subjects and stimuli is 30. The number of dimensions cannot be greater than 5.

The instructions manual from Bell Laboratories states that the programme gives a printed output for each subject as well as for the average subject, and a plotted output. The programme run at Massey gives the printed output but not the plotted one. Some inaccuracies can be found in the instructions manual for the input deck arrangement as well as in the content of Format cards. A full explanation of the errors and an example of input deck arrangement are given in Appendix J.

10.12 - Summary

This chapter has outlined the theoretical basis for the application of multidimensional scaling technique as well as the computer programmes used to operate it.

CHAPTER 11

RESEARCH DESIGN

11.0 - Introduction

In the consumer survey outlined previously (Chapter 9) three groups of people were identified. These were a group of non-drinkers (30% of the people sampled), a second group of occasional wine users (38% of those sampled) and a third group of regular wine consumers (32%).

The purpose here is to study the perceptions and preferences of the group of consumers who drink wine regularly and whose consumption accounts for more than half of the total wine consumption.

It appears from the literature that multidimensional scaling methods are an appropriate tool for analysing consumer behaviour. This type of analysis refers to the examination of products in the market as perceived by consumers using a geometrical spatial model (Chapter 10).

11.1 - Objectives

The specific objectives of the study were:

a) to find out how the products on the market are perceived by regular consumers,

b) to learn about consumer desires and preferences,

c) to measure the extent to which these preferences are satisfied by the current market,

d) to assess the degree of acceptance of new classical varieties that could have some production potential in New Zealand,

e) to experiment with multidimensional scaling for this particular type of analysis, and

f) to test the vectorial model for the labelling of the axis.

11.2 - Research procedures

If a geometrical spatial model is chosen the above objectives can be translated into the following steps:

a) to construct a product space and a geometric representation of consumers' perception of products and brands,

b) to obtain the position of vectors in the same space based on bipolar scales of attributes of the products covered by the study,

c) to position ideal points of the consumers in the same space, and

d) to construct a model which predicts preferences of the group of consumers towards new products.

11.3 - Selection of items

The criterion for selection of items is arbitrary and depends on the objectives to be achieved. If the research was to be carried out by a marketing manager of one of the existing firms, the purpose of the study would be to find out how that firm's brands and types of wine were perceived by consumers in relation to others and to look for gaps in the market to determine the opportunity for new products or different marketing strategy for the existing ones. Since the present study is not intended to be focused on any particular brand the emphasis is to be placed more on the comparison of types than on the comparison of brands, but without forgetting that the market is an interrelation of brands and products as defined by Bernett (1969).

Consumers interviewed in the general survey carried out in Palmerston North were able to name 68 wines of 9 different types from 30 different brands of table and dessert wines.

The present study is restricted to table wines only: sparkling, still red still white, and rose. The choice of items from these types was based on the following criteria: quality, production potential in New Zealand and popularity of New Zealand and overseas wines. Another important and restrictive factor considered was that wine had to be known by respondents. Wines not fulfilling this requirement were not included in the sample.

Results of the general survey gave an indication of the wines that were most popular among wine drinkers (Appendix K). Eschenbruch, an oenologist at the Ruakura Agricultural Research Station, provided a list of wines selected by quality and production potential in New Zealand (Appendix L). Some of the types from this list were not yet known by the New Zealand consumer and therefore had to be rejected. Since New Zealanders showed their preference in the general survey for overseas wines, some overseas wines were included for comparative purposes. The wines finally selected are shown in Table 11.1.

After the selection of items had been made, two reports from the DSIR (Robertson 1976) about the chemical composition of some New Zealand wines became available. The findings of these reports corroborated that vitis vinifera types of wine had fewer chemical faults than hybrid types. These reports did not disclose, however, either the names or brands of these wines. Both reports (one for red wines and the other for white wines) highlighted the faults of manufacturing that cause deterioration in the quality of wine, and the high content of some components which exceed the level allowed by the Food and Drug Regulations.

11.4 - Number of items and method of data collection

Any number of items could have been selected, although for practical purposes the technique to be used imposed certain limits depending on the method of data collection.

In the present study 4 types of wines were to be included, therefore the minimum number of items was 4. The maximum number of items had no limit other than that imposed by practical considerations. For a small number of items the distance type model of pair by pair comparisons can be used (Section 10.8) but when the number of pairs becomes too large, the respondent's fatigue has to be taken into account as this can affect the accuracy of judgements made.

The selected items are shown in Table 11.1. The distance type model of data collection, pair by pair comparisons, was used as the number of items was small.

Table 11.1 - List of selected wines

			Code
White wines	Pinot-Chardonnay	..... McWilliams	C
	Hock	..... Mission	A
	Blue Nun	..... German wine	H
	Riesling Sylvaner	..... Corbans	I
Red Wines	Cabernet Sauvignon	..... Cooks	F
	Burgundy	..... Penfolds	G
	Pinotage	..... Montana	B
Rose	Spritzig Rose	..... McWilliams	E
Sparkling	Premier Cuvee (Medium)	..... Corbans	D
	Cancia Asti Spumanti	..... Italian wine	J

The number of the total pairs is:

$$C_n^2 = \frac{n!}{2![n-2]!} = \frac{10!}{2![10-2]!} = 45$$

11.5 - Selection of respondents

The primary criterion for the selection of the sample had to be the knowledge of wine that the respondents had. It is essential that they knew the wines to be judged since tasting was not going to be part of the experiment. More important than the perceptions and preferences of the consumers at the moment of tasting the products are the general characteristics that they remember about the products and how these impressions influence their choice at the moment of purchase.

The general survey identified regular wine drinkers who would accept being interviewed a second time. The original sample for the survey was selected randomly and from this a sub-sample of respondents was chosen. The people of this subsample had common socioeconomic characteristics.

11.6 - Number of respondents

Fenker (1972:1) stated that: "a major difficulty associated with the application of multidimensional scaling (MDS) technique is that current methods of collecting proximity data severely limit the feasible sample sizes". Fenker (1972:1) also pointed out that: "there have been several methods discussed in the literature for circumventing the restrictions of sample size". However, he added that "none of these alternatives has been systematically evaluated, and it is readily apparent that there are difficulties with each".

It is also evident from the literature that samples used for pilot studies of MDS have usually been small. Green and Tull (1970) in their illustration of MDS techniques presented pilot studies which involved a small number of respondents. For example, one pilot study that culminated in the construction of a joint space configuration involved a small number of marketing academics and researchers in the Philadelphia area. Also in one of the illustrative applications of the Carrol and Chang's (1964) pair to pair comparisons model, data from twelve respondents were used.

Green, Maheshwari and Rao (1969:161) in their presentation of preference and similarity judgements for 2 groups used responses obtained from knowledgeable people in the subject area: 19 Group A subjects and 18 Group B subjects. Also other papers on the application of MDS (Shepard, Romney and Nerlove 1972:11) used responses obtained from small sizes: "the sample consists of three groups: 10...., 5.... and 11.... adults".

It appears, therefore, that there is not a unique general criterion for determining the number of respondents and that for pilot studies the number of respondents has been usually small. The pilot study reported here is similar, as only a small sample could be utilised within available resources. Moreover, the sample was not selected probabilistically. Consequently, any inference from the sample results to the population of consumers must be made very cautiously, and solely on the basis of personal judgement. Thirty two persons from the general survey met the minimum requirements of knowledge of selected wines. Of these only 20 consented to be interviewed again. This establishes that of 237 respondents initially approached, only a sub-sample of 20 respondents met the minimum requirements established for the application of the technique.

11.7 - Application of multidimensional scaling - Survey design

The collection of data was carried out in three parts:

Part A - Study of direct similarities

Part B - Study of derived judgements

Part C - Study of preferences

11.7.1 - Part A - Study of direct similarities

Individuals were asked to indicate the degree of similarity for each of the 45 pairs of wines. A 7 point scale was used for the ratings. The full scale of degrees of intensity was as follows:

	Scale value
"Extremely" similar	1
"Very" similar	2
"Slightly" similar	3
"Neither" similar "nor" different	4
"Slightly" different	5
"Very" different	6
"Extremely" different	7

The respondent could base his/her judgement of "general similarity" on a substitution criterion. The criterion of general similarity was, however, assessed by the respondent as long as he/she maintained the same frame of reference throughout all comparisons (Appendix M).

11.7.2 - Part B - Study of derived judgements

The respondents were asked to judge the 10 wines on each of the following bipolar scales of opposite attributes:

1 - White/Red
2 - Still/Sparkling
3 - Sweet/Dry
4 - Light/Body
5 - Distinctive nice flavour and taste/Unpleasant flavour and taste
6 - Good quality wine/Bad quality wine
7 - Cheap/Expensive
8 - Appropriate to drink with food/Appropriate to drink on its own
9 - Convenient package or nice container/Inconvenient container size or shape
10 - Easily available/Difficult to obtain

For each bipolar scale the respondent rated each of the wines on a 7 point intensity scale similar to the one used in Part A. For example, for bipolar scale No. 6 this is:

		Scale value
"Extremely"	good quality wine	1
"Very"	good quality wine	2
"Slightly"	good quality wine	3
"Neither"	good "nor" bad quality wine	4
"Slightly"	bad quality wine	5
"Very"	bad quality wine	6
"Extremely"	bad quality wine	7

11.7.3 - Part C - Study of preferences

In order to know the respondent's personal preferences for each of the items in different situations, he/she was asked to rank the 10 wines from most preferred to least preferred in the following scenarios:

a) Overall preferences
b) Social celebrations and parties
c) At home having dinner with guests
d) At the restaurant

The ranking position under each situation would be given number 1 for the highest and 10 for the lowest.

Highest	1	6
	2	7
	3	8
	4	9
	5	10 lowest

At the end of the interview the respondent was asked to average the number of bottles consumed per week and how a change in price upwards or downwards would affect this level of consumption.

The first step of this study, the analysis of direct similarity data, subjected to previous tests of subject agreement and reliability of the obtained data, is outlined in the following chapter (Chapter 12). Analyses of derived similarity data (Chapter 13) and preference data (Chapter 14) follow.

11.8 - Summary

The design of a pilot study of consumer behaviour, perceptions and preferences using multidimensional scaling has been outlined. Research procedure, selection of items, data collection method in relation to the number of items, selection of respondents and survey design have been also presented in this chapter.

CHAPTER 12

RELIABILITY OF OBTAINED DATA AND ANALYSIS OF DIRECT SIMILARITIES

12.0 - Introduction

Of the 20 subjects interviewed, 10 were able to complete the questionnaire fully, and the other 10 were not able to complete it, either because they lacked knowledge of some of the wines, or because they were uncertain in making their judgement (the KYST programme can cope with missing data).

To justify the aggregation of subjects in a single configuration of similarity data and an average ideal point for the same subjects, some tests of subject agreement and reliability can be done. The measurements of reliability and agreement have been based on the 10 subjects that had no missing values.

12.1 - Reliability ratio of Kuder-Richardson

The ratio (r) is a measure of the ratio of true score variance to total or observed variance (Mehrens and Lehmann 1973).

$$r = \sigma_t^2 / \sigma_o^2 = [\sigma_o^2 - \sigma_e^2] / \sigma_o^2 = 1 - \sigma_e^2 / \sigma_o^2$$

where σ_t^2 is the true score variance which is the difference between the total variance σ_o^2 and the estimated error variance σ_e^2.

σ_e^2 is equal to the sum of the variance of the subjects' scores.

$$\sigma_e^2 = \sum_{i=1}^{m} \sigma_i^2 = (1/n) \sum_{i=1}^{m} [\sum_{j=1}^{n} x_{ij}^2] - (1/n)^2 \sum_{i=1}^{m} [\sum_{j=1}^{n} x_{ij}]^2$$

Where 'm' is the number of subjects, and 'n' the number of stimuli

$$\sigma_o^2 = (1/n) \sum_{j=1}^{n} [\sum_{i=1}^{m} x_{ij}]^2 - (1/n)^2 [\sum_{j=1}^{n} \sum_{i=1}^{m} x_{ij}]^2$$

If r is close to 1, this indicates a low error variance due to subject variation relative to the variance of the total score. In other words this indicates a high level of agreement between subjects.

The result of the calculation of the reliability ratio is:

$6_e^2 = 13,131\ (1/45) - 125,043\ (1/45^2) = 230.05$

$6_o^2 = 532,538\ (1/45) - 2,290\ (1/45^2) = 11,830.05$

thus $r = 1 - (230.05/11,833.05) = 0.98$,
which shows a high level of agreement among subjects.

12.2 - Coefficient of concordance

Kendall's coefficient of concordance is the measure used to test the agreement among subjects' rank ordering of proximities (Kendall 1962).

$$W = 12 \frac{S}{m^2 (n^3 - n)}$$

'm' = number of subjects

'n' = number of objects

'S' = sum of the squares of the deviation of rank totals across all subjects, for each subject, from the mean sum of ranks.

The mean sum of ranks is $m(n + 1)/2$

If some of the rankings contain ties a modified formula can be applied:

$W = S/[(1/12)\ m^2]\ (n^3 - n) - m \sum_{T'} T'$ where

$T' = (1/12) \sum_{t} (t^3 - t)$ and 't' is the number of ranks in each tied set.

$T' = 47,632$

$m(n + 1)/2 = 230$

$S = 68,833$

$W = 68,833/[(1/12)10^2\ (45^3 - 45) - 476,320] = 0.2435$

The significance of the observed value of W has to be tested. The simplest test that can be used when $n>7$ is X^2 with $r = n - 1$ degrees of freedom.

$\chi^2 = m(n - 1)W = 107.14$

For $n - 1 = 44$ degrees of freedom at the 0.01 percentage significance level, the observed value of χ^2 is greater than the minimum value of χ^2 required for significance at that point. This observed χ^2 is, therefore, highly significant ($p < 0.01$).

12.3 - Multidimensional scaling analysis of direct similarity judgements

Each subject's response in Part A of the questionnaire provided the data to form an upper triangular matrix, with the diagonal absent, of 10 rows by 10 columns.

The processing of data was performed by using a KYST programme in a Burroughs B6700 computer. Layout data on cards and a listing of the KYST input deck are detailed in Appendix O.

In the present investigation 3 different configurations have been obtained for comparison purposes: one from the 10 subjects with complete values; a second from 10 subjects with missing values; and a third from all the 20 subjects.

12.4 - Analysis of direct similarity data for 20 subjects

Since the KYST programme can cope with missing values the aggregation of 20 subjects was possible.

A minimum stress of 0.0092 was reached at the end of 24 iterations for the three-dimensional solution (lower than the level considered by Kruskal (1964) as the minimum for an excellent fit). The stress value for two dimensions reached its minimum of 0.098 at the end of 23 iterations (between good and fair fit but closer to the level of a fair fit), and the stress value for one dimension reached its minimum of 0.303 at the end of 14 iterations (considered a poor fit - Figure 12.1).

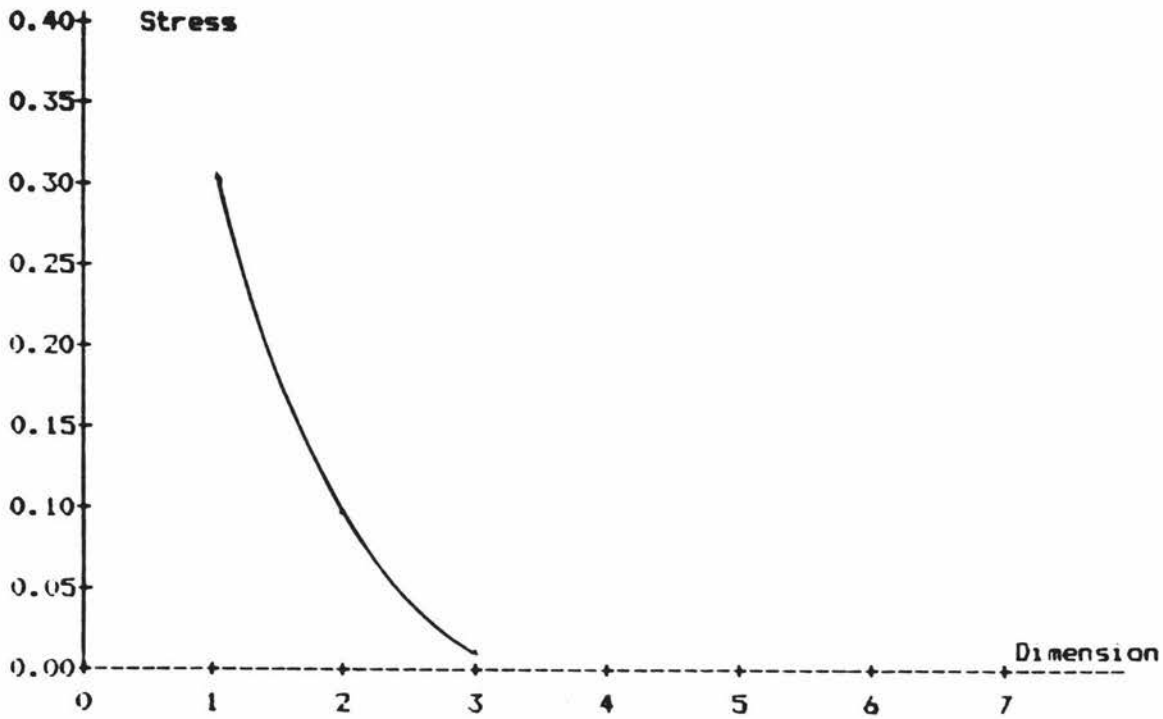


Figure 12.1 - Plot of stress versus dimension

Table 12.1 - Coordinates in 3 dimensions of the wines' similarity space for 20 subjects

Wines (Code - Table 11.1)	Dimensions		
	1	2	3
A	-0.439	0.241	1.286
B	-0.880	0.829	-0.361
C	-0.997	0.499	-0.387
D	-0.629	-0.902	-0.089
E	-0.509	-0.929	-0.080
F	0.530	-0.318	-0.115
G	0.629	-0.141	-0.135
H	0.760	0.214	-0.045
I	0.764	0.212	-0.037
J	0.770	0.294	-0.036

The three-dimensional solution has been chosen as the final configuration for similarity data to plot average ideal points and vector attributes, although for visual purposes the two-dimensional solutions will sometimes be used (Tables 12.1 and 12.2, Figures 12.2(a), 12.2(b) and 12.3).

12.5 - Clusters

Table 12.1 and Figure 12.2 (b) identify several clusters. Item 'A' has a place on its own quite apart from all the rest of the other items. Items 'B' and 'C' have similar coordinates and are relatively closely located in the space compared with the other items (cluster 1). Items 'D' and 'E' form cluster 2. Items 'F', 'G', 'H', 'I', and 'J' form another cluster that can be subdivided into two subclusters: 'F' and 'G' (cluster 3a) and 'H', 'I' and 'J' (cluster 3b).

The main factors differentiating these clusters could be variety, type, quality and idea of substitution for a particular occasion. The subjects' responses transferred to the geometrical space model show that Hock had no close substitutes among the other wines in the sample.

First cluster: Pinotage and Pinot-Chardonnay are not too close together as one is a red wine and the other a white wine but respondents judged them as relatively similar possibly because they come from a pinot vitis vinifera variety, have similar names and/or could have been perceived as of relatively similar quality.

Second cluster: Premiere Cuvee was considered the worst quality wine, as will be substantiated by the vector attribute model, and Spritzig Rose has been judged by the respondents as its closest substitute in relation to the rest. Comments made by the respondents indicated that Spritzig Rose was not classified as a bad quality wine, but when its other attributes were considered such as sweetness and appropriateness for drinking on its own, it was positioned closer to Premiere Cuvee than the other wines. Gancia Asti Spumanti was not in this group because firstly, it is an overseas wine, and secondly, it was probably considered of better quality than Premiere Cuvee. Therefore, despite the fact that both are sparkling wines, they were perceived as being very different.

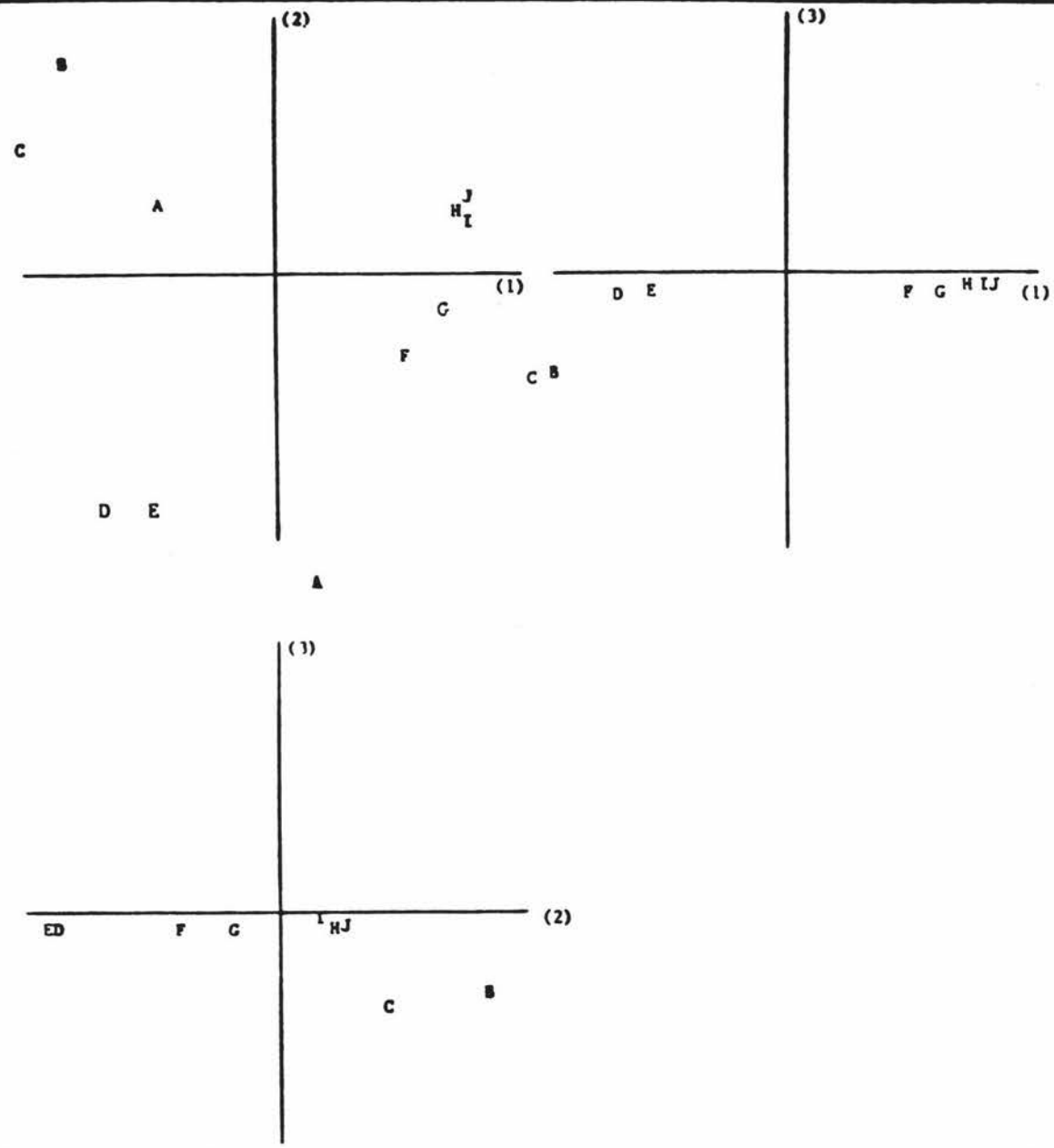


Figure 12.2 (a) – Configuration of wines' similarities in three dimensions for 20 subjects

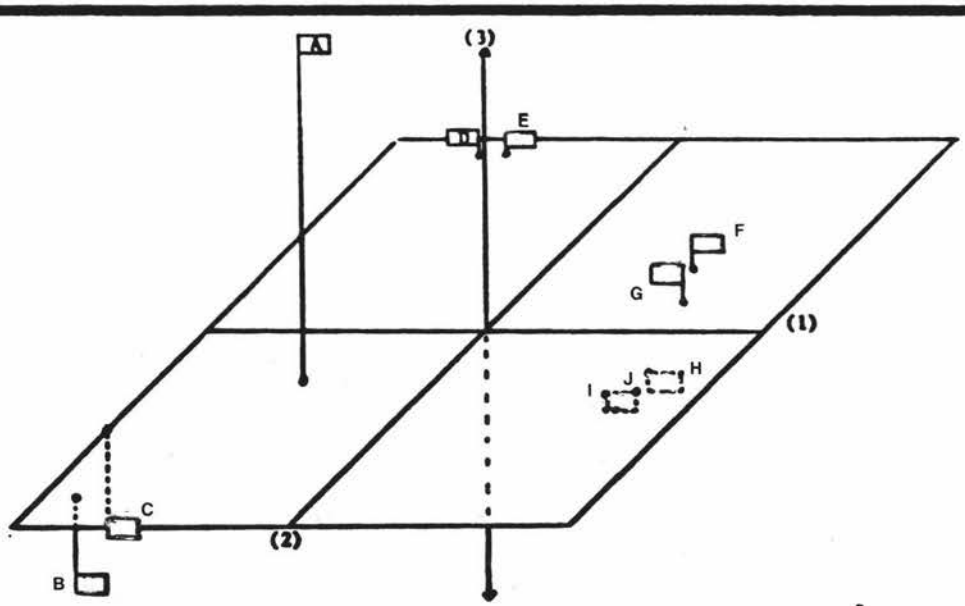


Figure 12.2 (b) – Configuration of wines' similarities in a three-dimensional space for 20 subjects

Table 12.2 - Coordinates in 2 dimensions of the wines' similarity space for 20 subjects

Wines	Dimensions 1	2
A	-0.061	-1.452
B	-1.110	0.626
C	-1.103	0.052
D	-0.794	-0.834
E	-0.522	-0.861
F	0.653	-0.192
G	0.612	-0.233
H	0.733	-0.041
I	0.776	-0.036
J	0.815	0.067

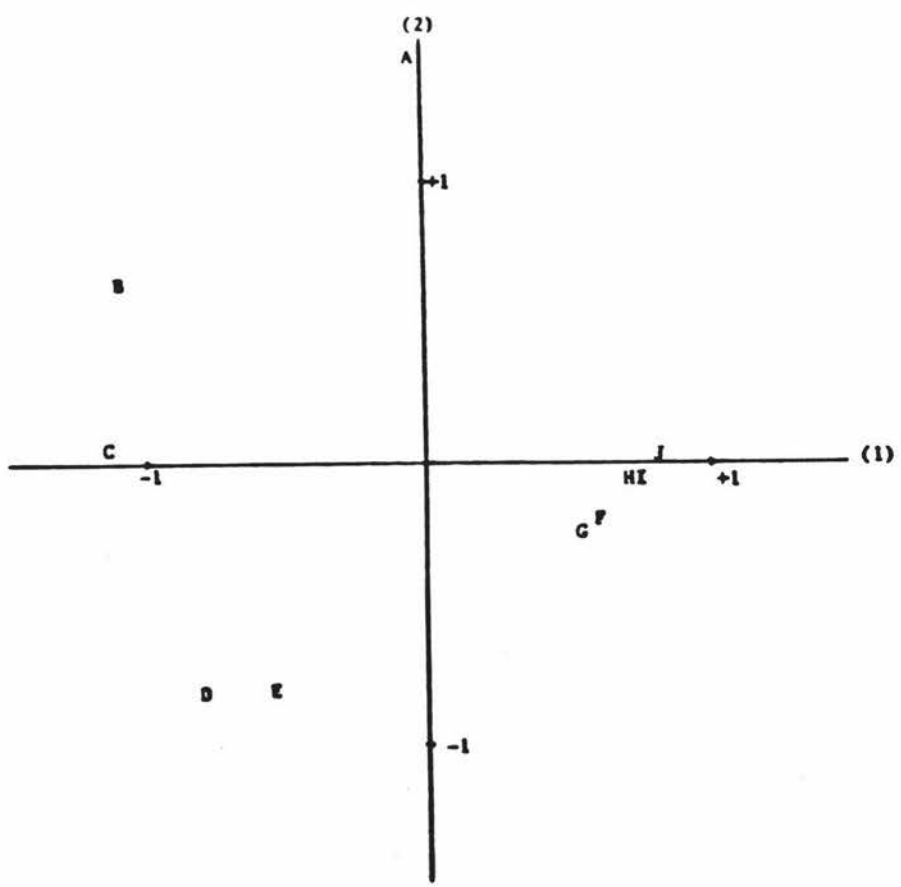


Figure 12.3 - Configuration of wine similarities in a two-dimensional space

Third cluster: Burgundy and Cabernet Sauvignon form the subcluster (a) based on difference of colour from subcluster (b). However, they were still perceived as being similar to the white wines because they were considered appropiate to drink with food and shared similarities in quality, price and degree of sweetness/dryness. Subcluster (b) shows that Riesling Sylvaner was perceived as a close substitute for Blue Nun.

Analysis of the data has to take into account the following factors: firstly, every attribute is judged in a comparative way in relation to other wines in the sample and secondly the respondents found it difficult to follow the same criteria of similarity throughout the series of comparisons.

12.6 - Analysis of direct similarity data for 10 subjects with complete responses - Group A

The purpose of studying the 2 subgroups separately was to find out if there was any significant difference in their perceptions and preferences. Group B is composed of subjects who either lacked the knowledge of one or more wines in the sample or had some uncertainty in their judgement and left some missing values in one or more of the three parts of the questionnaire, while Group A subjects knew all wines in the sample.

By comparing the two groups some differences may become apparent in the space maps of perceptions and preferences.

The stress value for three dimensions is 0.1298, and the one for two dimensions is 0.1732. The two-dimensional configuration for a low number of subjects (namely 10) spreads the items forming a circle. In that particular case the number of iterations was 16 and the stress did not improve after this iteration, therefore the programme stopped because the minimum was achieved, but the configuration was not at all satisfactory.

The final configuration of the 10 points in 3 dimensions for the 10 subjects with complete responses has the coordinates as shown in Table 12.3 and the configuration plot as shown in Figure 12.4

The same basic clusters found in the configuration for 20 subjects can be

Table 12.3 - Coordinates in 3 dimensions of the wines' similarity space for 10 subjects with complete scale values

Wines	Dimensions		
	1	2	3
A	-0.381	0.875	0.550
B	-0.631	0.808	-0.064
C	-0.897	0.085	-0.108
D	-0.537	-0.738	-0.310
E	-0.385	-0.826	0.382
F	0.036	-0.217	-1.005
G	0.256	-0.458	0.876
H	0.665	0.355	-0.640
I	0.893	0.207	0.351
J	0.972	-0.090	-0.032

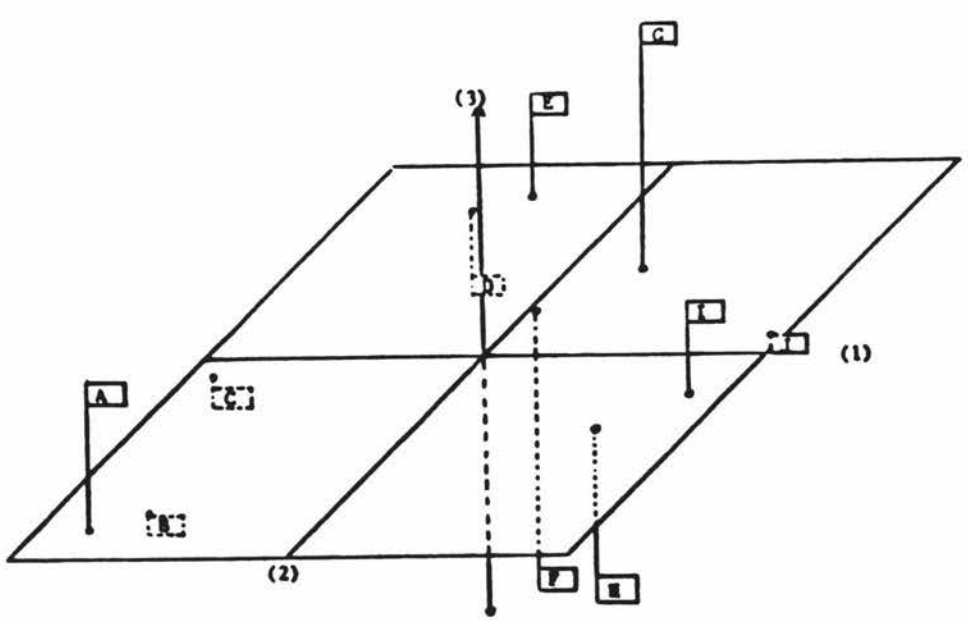


Figure 12.4 - Configuration of wine similarities in a three-dimensional space for 10 subjects with complete scale values

identified, but some significant changes have taken place in the 10 subjects configuration. Now 'A' belongs to the first cluster, 'D' and 'E' still form the second, and the third shows many differences in the third dimension, which represent extrinsic attributes as will be demonstrated by the vectorial model. A very important change in this configuration is that 'F' is closer to the centre, and therefore, perhaps closer to an ideal point, as will be determined by the study of preferences.

12.7 - Analysis of direct similarities data for the 10 subjects with incomplete responses - Group B

The stress value in three dimensions is 0.099, and in two dimensions is 0.1617.

The points in a two-dimensional configuration are again distributed around a circle. The stress did not improve after the 7th iteration.

The coordinates for the three-dimensional configuration are in Table 12.4 and the plots are in Figure 12.5.

The clusters of this group composed of the 10 subjects less knowledgeable about wine differ from the other configurations. The first cluster comprises 'B', 'C' and 'E'. The second one, 'G' and 'F', are very close together, and nearly occupying the same space in the geometrical configuration. The third cluster comprises 'J' and 'H', the two overseas wines.

'A' is still on its own in the space and closer to the centre. The analysis of preference data will tell if it is close to an overall preference point. 'I' is apart from the rest and so is 'D', but in the opposite direction.

12.8 - Summary

Data collected from 20 subjects for the analysis of similarities was aggregated to obtain a single configuration. The Kuder-Richardson reliability ratio and the coefficient of concordance shared a high level of agreement among subjects, enough to justify such aggregation. Configuration representing 20 subjects and 10 subjects with either

Table 12.4 - Coordinates in 3 dimensions of the wines' similarity space for 10 subjects with incomplete scale values

Wines	Dimensions		
	1	2	3
A	0.070	0.466	1.007
B	0.606	0.168	0.825
C	0.872	0.380	0.133
D	0.681	-0.287	-0.581
E	0.475	0.354	-0.826
F	-0.116	-0.984	0.091
G	-0.129	-0.984	0.074
H	-0.764	-0.235	-0.272
I	-0.896	-0.235	0.009
J	-0.800	0.568	-0.194

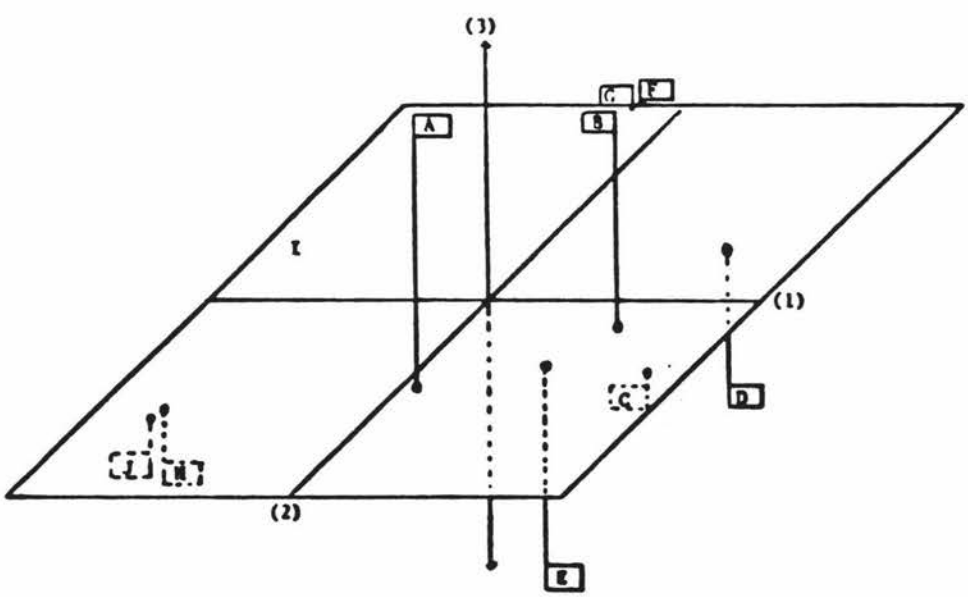


Figure 12.5 - Configuration of wine similarities in a three-dimensional space for 10 subjects with incomplete scale values

complete or incomplete responses showed different clusters, which means different perceptions of the wines selected for the study, depending on the subjects' knowledge of wine.

CHAPTER 13

ANALYSIS OF DERIVED SIMILARITY DATA

13.0 - Introduction

The labelling of the axes has been one of the major problems and drawbacks of the multidimensional scaling technique (MDS) and it is often absent in studies using multidimensional analysis. Some researchers have attempted to correlate the points along the axes with the physical properties of the objects, but very often value judgements have been used for the labelling of the axes.

In the present chapter an attempt is made to interpret the configuration through the derived measures of similarities obtained from the respondents and based on their judgements upon pre-specified sets of attributes. The data obtained in this way allow the development of a vectorial model where each one of the vectors would correspond to a different attribute of the objects. This mapping of vectors can be plotted on to the external configuration of points from direct similarity judgements. This method could help recognise some perceptual dimensions which would result in a more accurate interpretation of the axes.

This research method was developed by Green and Rao (1972). At the time the present project was carried out, it was still not widely applied. This piece of research was carried out on an experimental basis.

The processing of data was done with the computer programme, PREFMAP2, which was also experimental as it had not been previously used at Massey University. PREFMAP2 was a revised version of PREFMAP (Code file MAPREF at Massey). The main improvement of PREFMAP2 is that the stimulus space can be obtained externally, as in MAPREF, as well as generated internally from the preference data themselves. Other improvements lie in the procedures for rotation and/or weighting of coordinates of the stimulus space.

There were considerable problems involved with the running of PREFMAP2 until some inaccuracies in the instruction manual were found by the researcher. The manual from Bell Laboratories has some basic errors in

the input data arrangement as well as in the content of Format Cards. A full explanation of corrections needed for the running of the programme and an example of input data arrangement are given in Appendix J.

The data of derived similarities came from Part B of the questionnaire processed with PREFMAP2 computer programme. No congruence test of the two configurations, derived similarity data, and direct similarity data is needed since the mapping of vectors from derived similarities has been plotted in the obtained configuration from direct similarities. However, the correlation coefficient between scalar products computed from the coordinates of every subject, and the squared distances of the original data can be used as a measure of individual goodness of fit and also as a measure of average subject goodness of fit (Green and Rao 1972).

13.1 - Goodness of fit

Tables 13.1 and 13.2 indicate that poor agreement among subjects is found in bipolar scales No. 1, 4 and 8 because they have low values for the average subject's correlation coefficients. The highest agreement is found in bipolar scale 6 (good quality/bad quality wines). Bipolar scales 7 and 10 have an acceptable level of concordance, while 2, 3 and 5 show a lesser degree of agreement among subjects.

The values of goodness of fit for individuals as well as for the average are higher in three dimensions than in two dimensions.

13.2 - Input data

For each of the bipolar scales specified in Part B of the questionnaire the format of the computer input data after the usual workflow statements is detailed in Appendix P.

13.3 - Interpretation of axes with the help of the vectorial model

13.3.1 - Two-dimensional space

The goodness of fit in a two-dimensional configuration has a stress 0.098, which is not as good as the fitness on three dimensions stress

Table 13.1 - Correlation coefficients computed for two dimensions across subjects and average subject for each of the 10 bipolar scales

Correlation coefficient between co-ordinates & squared distances of original data		Bi-polar scales									
		1	2	3	4	5	6	7	8	9	10
Subject	1	0.20	0.45	0.54	0.42	0.75	0.62	0.67	0.20	-	0.24
"	2	0.81	0.67	0.69	0.18	0.31	0.34	0.57	0.14	-	0.67
"	3	0.20	0.58	0.55	0.66	0.38	0.44	0.59	0.76	-	0.54
"	4	0.38	0.59	0.67	0.36	0.15	0.45	0.45	0.20	-	0.77
"	5	0.50	0.30	0.28	0.29	0.29	0.63	0.38	0.16	-	0.45
"	6	0.59	0.51	0.43	0.37	0.14	0.60	0.39	0.57	-	0.66
"	7	0.24	0.44	0.73	0.27	0.41	0.24	0.48	0.28	-	0.79
"	8	0.23	0.51	0.23	0.22	0.46	0.53	0.51	0.32	-	0.58
"	9	0.20	0.43	0.33	0.28	0.33	0.54	0.79	0.24	-	0.54
"	10	0.25	0.54	0.42	0.78	0.79	0.82	0.49	0.55	-	0.40
"	11	0.29	0.35	0.17	0.21	0.36	0.48	0.26	0.46	-	0.30
"	12	0.48	0.16	0.44	0.26	0.49	0.66	0.26	0.53	-	0.24
"	13	0.25	0.62	0.66	0.58	0.57	0.41	0.84	0.65	-	0.50
"	14	0.16	0.50	0.51	0.40	0.33	0.30	0.44	0.58	-	0.34
"	15	0.78	0.39	0.53	0.49	0.25	0.38	0.25	0.58	-	0.51
"	16	0.91	0.43	0.20	0.42	0.76	0.57	0.55	0.39	-	0.57
"	17	0.35	0.60	0.61	0.55	0.72	0.69	0.53	0.26	-	0.37
"	18	0.20	0.51	0.43	0.42	0.89	0.69	0.51	0.25	-	0.49
"	19	0.28	0.53	0.44	0.22	0.71	0.77	0.56	0.45	-	0.58
"	20	0.59	0.53	0.51	0.76	0.52	0.62	0.51	0.20	-	0.58
Average subject		0.20	0.51	0.54	0.15	0.42	0.63	0.50	0.44	-	0.82
Average of subjects' coefficients		0.40	0.51	0.50	0.41	0.48	0.54	0.53	0.39	-	0.51

Table 13.2 - Correlation coefficients computed for three dimensions across subjects and average subject for each of the 10 bipolar scales

Correlation coefficient between co-ordinates & squared distances of original data		Bi-polar scales									
		1	2	3	4	5	6	7	8	9	10
Subject	1	0.37	0.46	0.49	0.42	0.80	0.63	0.70	0.32	-	0.74
"	2	0.25	0.64	0.66	0.38	0.75	0.31	0.59	0.52	-	0.80
"	3	0.36	0.66	0.53	0.73	0.54	0.50	0.59	0.82	-	0.59
"	4	0.48	0.60	0.59	0.44	0.30	0.50	0.43	0.25	-	0.82
"	5	0.52	0.31	0.41	0.34	0.34	0.80	0.45	0.34	-	0.52
"	6	0.66	0.55	0.55	0.47	0.36	0.72	0.75	0.54	-	0.73
"	7	0.40	0.45	0.74	0.47	0.48	0.82	0.63	0.47	-	0.83
"	8	0.39	0.62	0.61	0.38	0.52	0.54	0.49	0.53	-	0.60
"	9	0.21	0.54	0.29	0.29	0.47	0.63	0.72	0.29	-	0.61
"	10	0.60	0.58	0.64	0.60	0.85	0.85	0.60	0.85	-	0.62
"	11	0.73	0.34	0.66	0.48	0.81	0.82	0.62	0.52	-	0.54
"	12	0.19	0.27	0.58	0.25	0.52	0.78	0.30	0.48	-	0.43
"	13	0.30	0.63	0.68	0.63	0.56	0.40	0.86	0.70	-	0.48
"	14	0.38	0.46	0.49	0.53	0.64	0.39	0.49	0.56	-	0.61
"	15	0.22	0.40	0.47	0.44	0.71	0.36	0.56	0.41	-	0.76
"	16	0.27	0.45	0.43	0.30	0.99	0.62	0.50	0.42	-	0.67
"	17	0.36	0.63	0.66	0.53	0.80	0.68	0.46	0.28	-	0.36
"	18	0.37	0.62	0.35	0.50	0.90	0.70	0.49	0.35	-	0.43
"	19	0.41	0.64	0.39	0.20	0.79	0.89	0.55	0.78	-	0.66
"	20	0.66	0.58	0.49	0.99	0.54	0.63	0.49	0.32	-	0.60
Average subject		0.37	0.53	0.52	0.72	0.57	0.67	0.55	0.48	-	0.82
Average of subjects' coefficients		0.41	0.52	0.54	0.51	0.63	0.63	0.56	0.51	-	0.62

0.009. A vectorial model has been plotted in the space previously obtained for the similarity data of 20 subjects. This is what is called external configuration. The purpose of this is to visualize the whole set of attributes and stimuli in a single diagram in order to attempt a fairly objective interpretation of the axis.

These bipolar scales correspond to pairs of opposite attributes and the respondent was asked to judge every item in relation to each of the 10 pairs of attributes, on a 7 degree scale.

In the two-dimensional diagram Figure 13.1, the tilts that seem to be significant because of the grouping of vectors are the ones close to the Y axis, and the ones close to an angle of 45 degrees. The bipolar scales 1, 2, 3 and 8 are close to the Y axis, and 4, 5, 6 and 10 are close to the diagonal 1st - 3rd quadrants (Tables 13.3 and 13.4).

The directions can be seen in Table 13.4.

Bipolar scale no. 9 was considered irrelevant by most respondents. Several respondents made the comment that long-neck bottles were elegant but inconvenient, because they could not be fitted in a vertical position in the refrigerator.

Since more than two perceptions in the direct similarity judgements were considered by the respondents, the two-dimensional configuration is not a faithful representation of the average perceptional map of subjects, and therefore it can be assigned more than one pair of attributes to every axis (Figure 13.1). For instance, wines located near the Y axis can be interpreted in the positive direction as being perceived by the consumer as dry and appropriate to drink with food, and in the negative direction as sweet and more appropriate to drink on their own. Vector 2 (sparkling/still) is also close to vectors 3 and 8, and it can be implied that people considered sparkling and sweet wines more appropriate to drink on their own, while still dry wines more appropriate to drink with food. There is no clear distinction between reds and white wines, which means that people did not base their judgement on similarities exclusively on colour. Two red wines 'G' and 'F' are always quite close in the geometrical space configurations for 2 and 3 dimensions, but except for

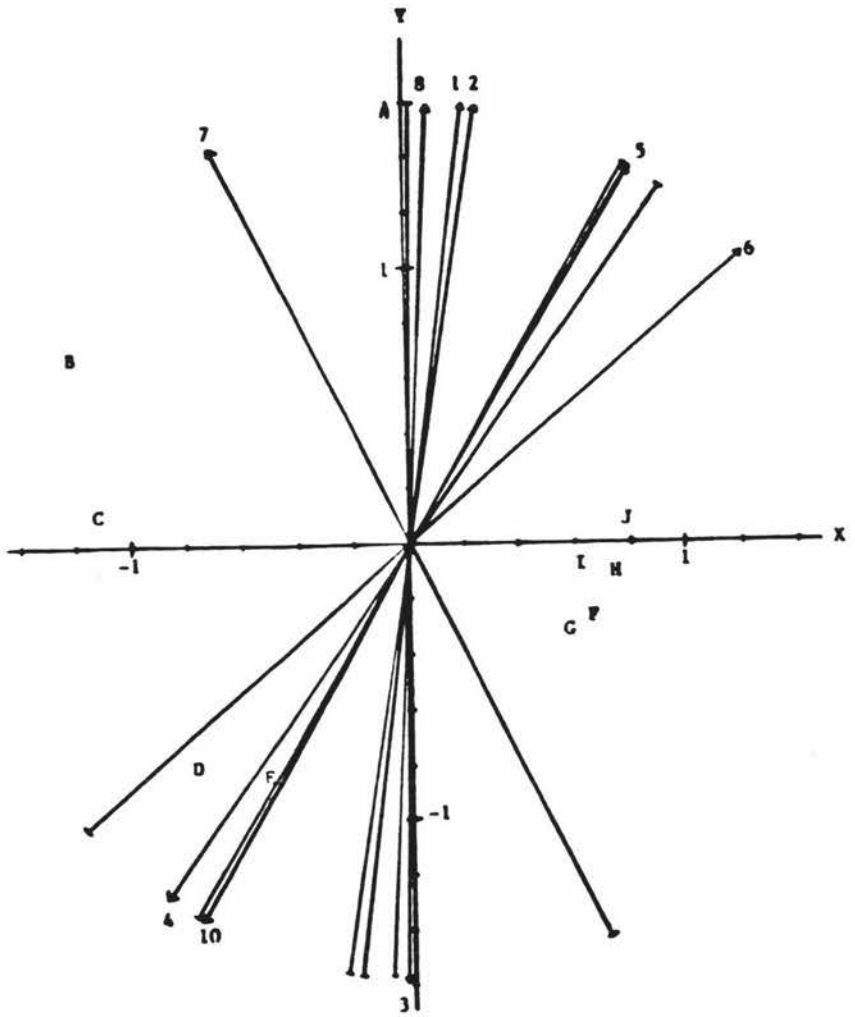


Figure 13.1 - Bipolar scales in two dimensions - 20 subjects

Table 13.3 - Coordinates of vectors representing bipolar scales

The direction cosines of the fitted average subject vectors are:

Bipolar scale	1	2
1 (white/red)	0.1295	0.9916
2 (still/sparkling)	0.1534	0.9882
3 (sweet/dry)	0.0067	-1.0000
4 (Light/body)	-0.5749	-0.8182
5 (Distinctively nice flavour and taste/ Unpleasant flavour & taste)	0.5302	0.8479
6 (Good quality wine/Bad quality wine)	0.7585	0.6517
7 (Cheap/expensive)	-0.4861	0.8739
8 (Appropriate to drink with food/ appropriate to drink on its own	0.0479	0.9989
9 (Convenient package or nice container/ inconvenient size or shape of container)	-	-
10 (Easily available/Difficult to obtain	-0.4962	-0.8682

Table 13.4 - Bipolar scaling directions

Bipolar scale No.	(-)	(+)
1	Red	White
2	Sparkling	Still
3	Sweet	Dry
4	Light	Body
5	Unpleasant taste	Nice taste
6	Bad quality	Good quality
7	Expensive	Cheap
8	Appropriate to drink on its own	Appropriate to drink with food
9	(Concerning the bottle's shape and size was considered irrelevant)	
10	Easily available	Difficult to get

Table 13.5 - Coordinates of vectors in three dimensions representing bipolar scales

Bipolar scale	1	2	3
1	-0.0250	0.3627	0.9316
2	0.0620	0.9787	0.1958
3	0.0499	-0.9564	-0.2877
4	-0.7165	-0.5101	0.4758
5	0.2941	0.9556	-0.0210
6	0.5742	0.7779	0.2552
7	-0.5742	0.2166	-1.1057
8	-0.0164	0.0043	-0.1057
9	-	-	-
10	-0.2773	-0.4181	-0.8651

that proximity distance the configurations show that other attributes have more weight in the judgement of similarities among the wines.

The dominant aspect in the diagonal is the agreement among nearly all subjects that 'D' was a bad quality wine with unpleasant taste and flavour, and 'D' is exactly located on the diagonal line vector 6, which also has the highest level of concordance among subjects. Item 'E' has been associated with the same attributes by being positioned quite close to 'D' in the configuration. On the other hand the upper right quadrant, where the vectors "good quality wine" and "pleasant taste" lie, is empty.

In the two-dimensional configuration the difficulty of labelling the X axis in an objective manner is quite obvious. Most of the components are along this axis, because the KYST option "rotate to principal components" was used, while the vectors are distant from that axis. If a rotation of the axis of 45 degrees is assumed, with the points remaining still, vector 7 would be close to axis Y and vectors 4, 5, 6 and 10 would be close to axis X. The wines in the positive quadrants could be considered as being perceived by the respondent as relatively cheap and the ones in the lower quadrants as expensive.

The X axis would be where the diagonal was before, and therefore labelled as good and bad quality in relation to the other attributes represented by the other close vectors.

13.3.2 - Three-dimensional space

The direction cosines of fitted average subject vectors are listed in Table 13.5

The projections of the points in the space to any of the vectors are the distances that measure the perceptions that the respondents have about the wines related to their attributes.

In the space of dimension (1,2), two vectors changed direction from the original bipolar scales as indicated for the direction cosines in table 13.5. The vectors are numbers 4 and 10 as shown in Figure 13.2.

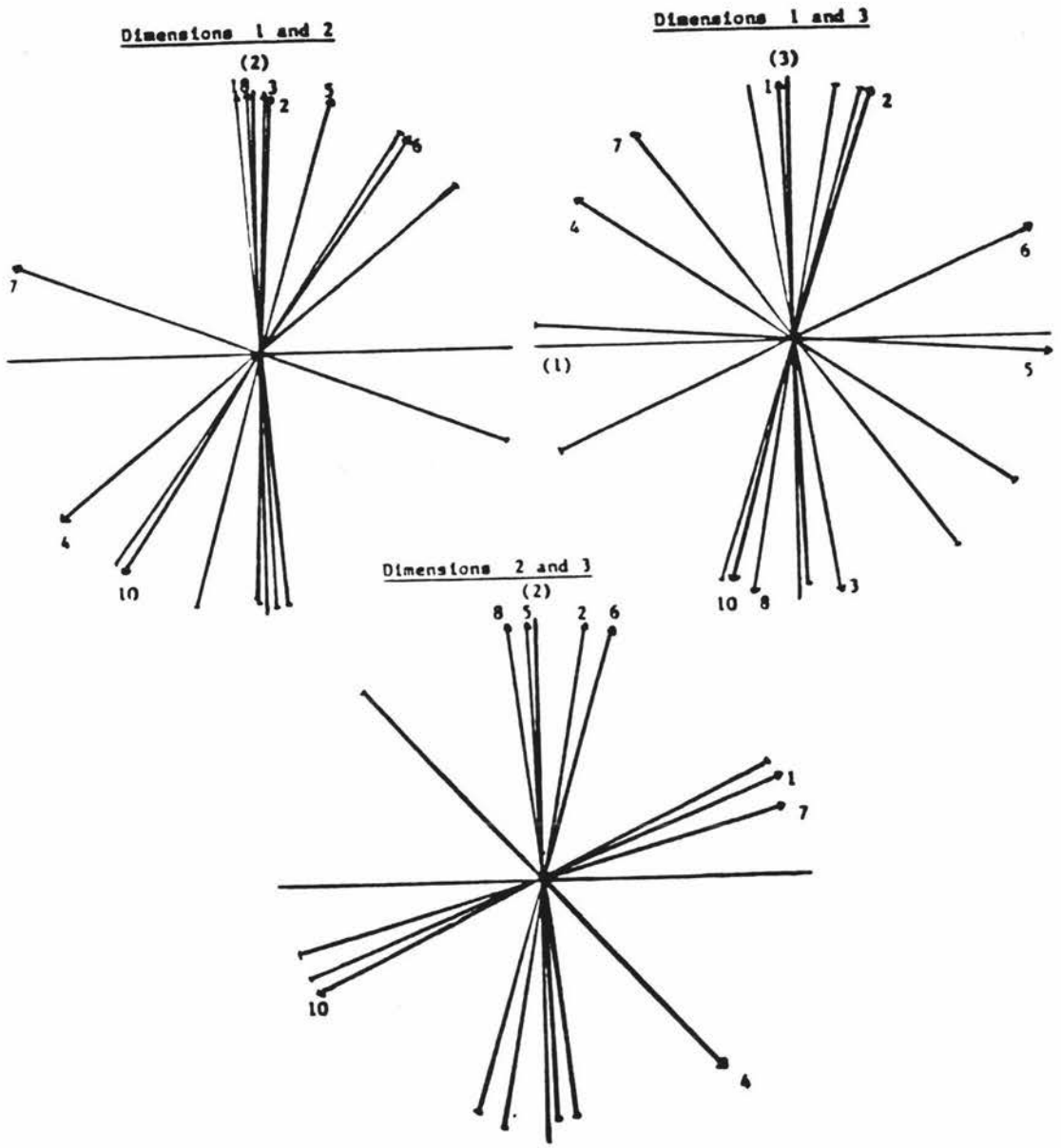


Figure 13.2 - Bipolar scales in three dimensions - 20 subjects

	+	-
4	Body	Light
10	Difficult to obtain	Easily available

In the space of dimensions (1,3) three vectors changed direction. They are numbers 3, 8 and 10

	+	-
3	Dry	Sweet
8	Appropriate to drink with food	Appropriate to drink on its own
10	Difficult to obtain	Easily available

In the space of dimensions (2,3) vectors 3, 4 and 10 changed direction

	+	-
3	Dry	Sweet
4	Body	Light
10	Difficult to obtain	Easily available

An attempt was made to label the three axes through the interpretation of the vectors' proximity to the axes. The vectorial map Figure 13.2 shows that some vectors are very close to one another and so are the attributes they represent. Some of the attributes are closely related and therefore the axes may be labelled with more than one attribute.

Vectors 1 and 4 have a low level of concordance as shown by the value of correlation coefficients. This means that there was disagreement among subjects in respect to those property vectors (Table 13.2).

The closest vectors to axis (1) are 4 and 7 in space (1,2) and 5 and 6 in space (1,3). The closest vectors to axis (2) are 8, 3, 1 and 2, in that order for space (1,2) and 5, 8, 2 and 6 for space (2,3). The closest vectors to axis (3) are 1, 3, 8 and 10 in space (1,3) and 7, 1 and 10 in space (2,3).

Interpretation and labelling of the three axes:

a) Axis (1)

Since vector 5 is more closely related and identified with axis 2, the more appropriate label for the first dimension seems to be "Body" in the positive direction and "Light" in the negative direction.

b) Axis (2)

The second dimension seems to be quite clear in spite of the closeness of so many vectors. The wines perceived as unpleasant are in the negative direction of this spatial dimension, and vector number 5 is very close to this axis with its positive attribute "nice taste and flavour", and its negative attribute "unpleasant taste and flavour". This is related at the same time to sweetness and dryness of vector 3 that changed direction from its original position in the bipolar scale. Thus it is now dry in the positive part of the 2nd dimension in the space, and sweet in the negative second quadrant. Vector 6 crosses the second quadrant showing clearly the direction of "bad quality" wines.

c) Axis (3)

Finally the third dimension is more difficult to relate to a single attribute. The more relevant ones seem to be the extrinsic attributes like price and availability. Vector 10 on its positive side is "difficult to obtain" in Palmerston North, which perhaps makes point 'A' separated from the rest. Vector 7 is "cheap" in its positive direction and "expensive" in its negative one.

Perhaps for maximum congruence on labelling the axes, some rotation of the axes should have been done, but this has been an attempt to interpret the initial space configuration obtained from the direct similarity data and rotated to principal components. However, more important than the labelling of axes is the analysis of the geometrical model as a whole, with the location of wines in respect to the vectors and in respect to each other.

13.4 - Summary

Vectors representing bipolar scales of attributes have been plotted in the previously obtained configuration from direct similarities for 20 subjects. The direction cosines of the fitted average subject vectors

were given by the signs positive or negative of the coordinates. From them an interpretation and subsequent labelling of axes in 2 and 3 dimensions have been attempted.

The position of the points in the space in respect to the vectors shows how each wine is perceived in respect to each of the attributes. The distance of the point projected to any vector is the relative measure of how much of that property the wine has or is perceived to have.

CHAPTER 14

ANALYSIS OF PREFERENCE DATA

14.0 - Introduction

The primary data for the present analysis is the data on overall preferences and those scenario-dependent preferences. Four matrices of 10 by 20 have been formed with the ranking data given by the respondents in Part C of the questionnaire. Carroll and Chang's computer programme PREFMAP2 has been chosen for the processing of this data due to its options of metric versus non-metric, internal versus external analysis and unfolding analysis including the possibility of non-monotonicity in the function relating preference to distance of stimuli from the ideal point. The concept of differences in preference should not be confounded with differences in perception. Therefore, if a map of preferences through internal analysis is constructed it should be called "evaluative" space rather than "perceptual" space (Green and Rao 1972). The point-point model of Phase 3 from PREFMAP2 that represents stimuli, individuals, and average subjects in a common space was selected for the present study of preference data.

A person point can be thought of as a hypothetical one that optimises the person's scores and is preferred to all other combinations. The concept of the average ideal point is the hypothetical one that optimises scores of all the subjects and is preferred to all other combinations.

Carroll and Chang (1967) developed a non-metric model that accepts rank order preference data and yields metric joint space configurations. Preference data can be entered in the external configuration of perceptual space obtained previously from direct similarity data. The non-metric version of the PREFMAP2 algorithm fits monotonic functions between the preference scale values and the squared Euclidian distances between the ideal point and the stimulus points in the following way:

1) The parameters of the scales values of preferences are solved as in the metric version $s_{ij} = a_i d_{ij}^2 + b_i$ where a_i and b_i are constants ($a \geqslant 0$) and d_{ij} is the square of the Euclidian distance.

2) An estimation is made of the monotone function $M_i^{(1)}$ that relates the estimates scales values ($\hat{S}_{ij}$) to the originals (S_{ij}) using the procedure described by Kruskal (1964) for the least squares monotone regression.

3) The S_{ij} is replaced by $S_{ij}^{(1)}$ to compute a new set of values.

4) The new set of $\hat{S}_{ij}$ is used to compute a new monotone function $M_i^{(2)}$ and a new set of $\hat{S}_{ij}$, namely $S_{ij}^{(2)}$.

5) This iterative procedure is continued until the process converges. The process is terminated by a parameter called CRIT. When CRIT is greater than or equal to the sum of square of differences in the predicted S_{ij} the process stops at that iteration.

14.1 - Measurements of subjects' agreement and goodness of fit for ranking data

The coefficient of concordance of ranked preference data has been calculated for the 10 subjects with complete ranking.

W = 0.27 and
χ^2 = 24.71 for 9 degrees of freedom, which is highly significant ($P<0.01$)

The correlation coefficients between data and squared distances can be used as a measure of goodness of fit of the ideal points (Tables 14.1 and 14.2) for the four different scenarios:

Code	
Scenario A - O.P.	Overall preferences
Scenario B - S.B.	Celebration, Parties, etc.
Scenario C - S.C.	At home (having dinner with guests)
Scenario D - S.D.	In the restaurant

Table 14.1 - Correlation Coefficients Computed for 2 Dimensions Across Subjects and Average Subject for Each One of the Scenarios of Preferences

Subjects	Scenarios			
	A	B	C	D
1	0.78	0.74	0.76	0.71
2	0.78	0.86	0.71	0.89
3	0.98	0.78	0.98	0.99
4	0.62	0.64	0.81	0.81
5	0.72	0.73	0.77	0.77
6	0.73	0.88	0.76	0.76
7	0.96	0.65	0.99	0.99
8	0.85	0.78	0.86	0.86
9	0.79	0.82	0.80	0.83
10	0.72	0.98	1.00	0.99
11	0.98	0.97	0.97	0.98
12	0.93	0.94	0.94	0.94
13	0.80	0.85	0.80	0.80
14	0.77	0.83	0.83	0.83
15	0.83	0.71	0.66	0.71
16	0.79	0.72	0.90	0.80
17	1.00	0.73	1.00	0.99
18	0.99	0.79	0.64	0.63
19	0.91	0.76	0.79	0.78
20	0.88	0.86	0.72	0.78
Average subject	0.92	0.61	0.25	0.33
Average of subjects' coefficients	0.84	0.83	0.83	0.84

Table 14.2 - Correlation Coefficients Computed for 3 Dimensions Across Subjects and Average Subject for Each One of the Four Scenarios of Preferences

Subjects	Scenarios			
	A	B	C	D
1	0.96	0.82	0.54	0.80
2	0.76	0.85	0.69	0.94
3	0.99	0.83	0.99	0.98
4	0.90	0.70	0.87	0.87
5	0.84	0.85	0.89	0.90
6	0.78	0.85	0.74	0.56
7	0.99	0.74	0.99	0.99
8	0.97	0.79	0.95	0.96
9	0.77	0.80	0.75	0.78
10	0.83	1.00	0.99	0.99
11	0.98	0.99	0.99	0.98
12	1.00	0.98	0.98	0.98
13	0.89	0.83	0.78	0.78
14	0.91	0.92	0.92	0.92
15	0.92	0.82	0.82	0.82
16	0.77	0.77	0.85	0.75
17	1.00	0.79	1.00	1.00
18	0.98	0.73	0.78	0.69
19	0.87	0.70	0.78	0.81
20	0.94	0.78	0.84	0.80
Average subject	0.94	0.71	0.74	0.65
Average of subjects' coefficients	0.86	0.83	0.86	0.87

14.2 - External non-metric analysis of scenario-dependent preferences for 20 subjects

14.2.1 - Overall preferences - Scenario A

The analysis has been done in 2 and 3 dimensions by plotting the overall ideal point in both configurations obtained from the similarity data (Tables 14.3 and 14.4).

In both configurations the correlation coefficient (goodness of fit) for the average subject is very high (Tables 14.1 and 14.2).

The ideal point is in an empty space in both configurations, which means that none of the wines of the sample satisfies completely the consumer desires. The closest wines are 'F' and 'G' in the two-dimensional configuration and 'A' in the three-dimensional one (Figures 14.1 and 14.2).

14.2.2 - Wine preferences for special celebrations and parties - Scenario B

The correlation coefficient of the average subject in three dimensions is higher than the correlation coefficient for the same average subject in two dimensions (Tables 14.1 and 14.2).

In the two-dimensional space the ideal point is closest to cluster numbers 3 and 4 which include 'G', and 'F' (red wines), 'H' and 'I' (white wines) and 'J' (sparkling wine) (Figure 14.1).

In the three-dimensional space the point SB (Scenario B) is close to the ideal point of overall preferences, and therefore close to point 'A' of the stimulus configuration (Figure 14.2).

14.2.3 - Wine preferences at home, dinner with guests - Scenario C

In the two-dimensional configuration SC (Scenario C) is out of range. The goodness of fit for the average subject is very poor, and there is disagreement among subjects shown by the difference of the coefficient of correlation for the average subject and the average of subjects'

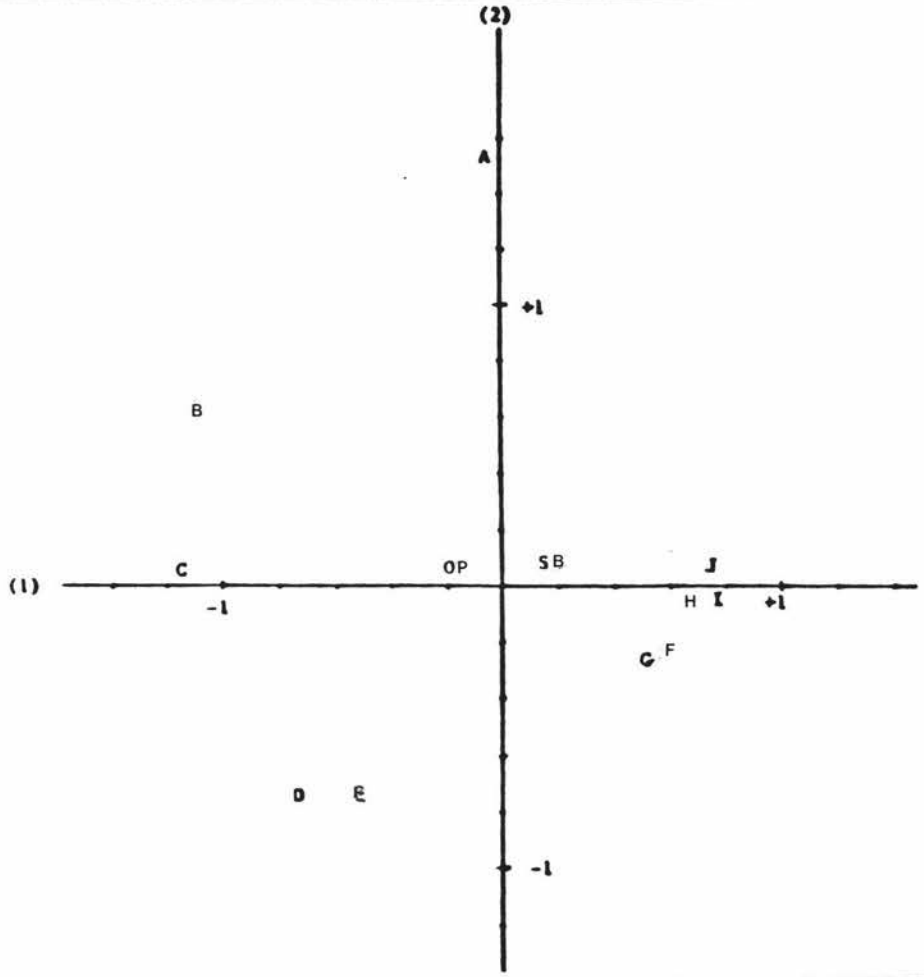


Figure 14.1 - Ideal points of 20 subjects in two dimensions

Table 14.3 - Coordinates of four average ideal points of scenario-dependent preference in two dimensions

Code	1	2	
Scenario A - OP	-0.15487	0.04675	
Scenario B - SB	0.19699	0.10989	
Scenario C - SC	3.12780	13.73300	(out of range)
Scenario D - SD	-1.37540	-0.71213	

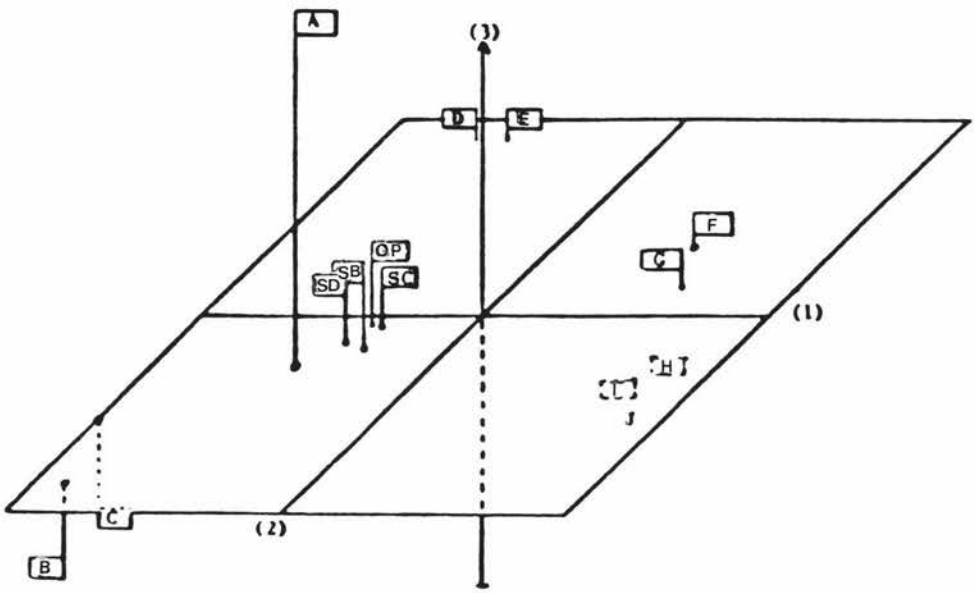


Figure 14.2 - Ideal points of four scenario-dependent preferences of 20 subjects in three dimensions

Table 14.4 - Coordinates of four average ideal points of scenario-dependent preferences in three dimensions

Code	1	2	3
Scenario A - OP	-0.28348	0.18448	0.29888
Scenario B - SB	-0.38150	0.12743	0.24363
Scenario C - SC	-0.30733	0.08426	0.26212
Scenario D - SD	-1.32470	0.07734	0.22124

correlations (Table 14.1)

In the three-dimensional space the goodness of fit is higher than in the two-dimensional one, and the point SC appears close to the points 'B' and 'C' in the same space but with a different sign in the third dimension. The coordinates of SC in the third dimension are similar to the coordinates of the points 'F' and 'G' (Figure 14.2).

14.2.4 - Wine preference in restaurants - Scenario D

The correlation coefficient of the average subject is higher in the three-dimensional configuration than in the two-dimensional one (Tables 14.1 and 14.2).

The judgements of the respondents on this particular scenario were influenced by considerations of availability. Their judgements were not so much on the wines that they would like to drink in a restaurant, but on those wines that they knew to be available in restaurants.

'E' is the closest point to SD (Scenario D) in the two-dimensional configuration, and 'B' and 'C' are the closest in the three-dimensional configuration (Figures 14.1 and 14.2).

14.3 - External non-metric analysis of scenario-dependent preferences split in 2 groups of 10 subjects

14.3.1 - Ten subjects with complete responses - Group A

Ideal points have been plotted only in the three-dimensional configuration of direct similarities of the 10 subjects who could complete successfully the 3 parts of the questionnaire. The ideal points have not been plotted in 2 dimensions because the two-dimensional space configuration was rejected in the study of similarity data.

The coordinates of the ideal points for the four scenario-dependent preferences are shown in Table 14.5, and the correlation coefficients of the average subject for each of the scenarios are as follows:

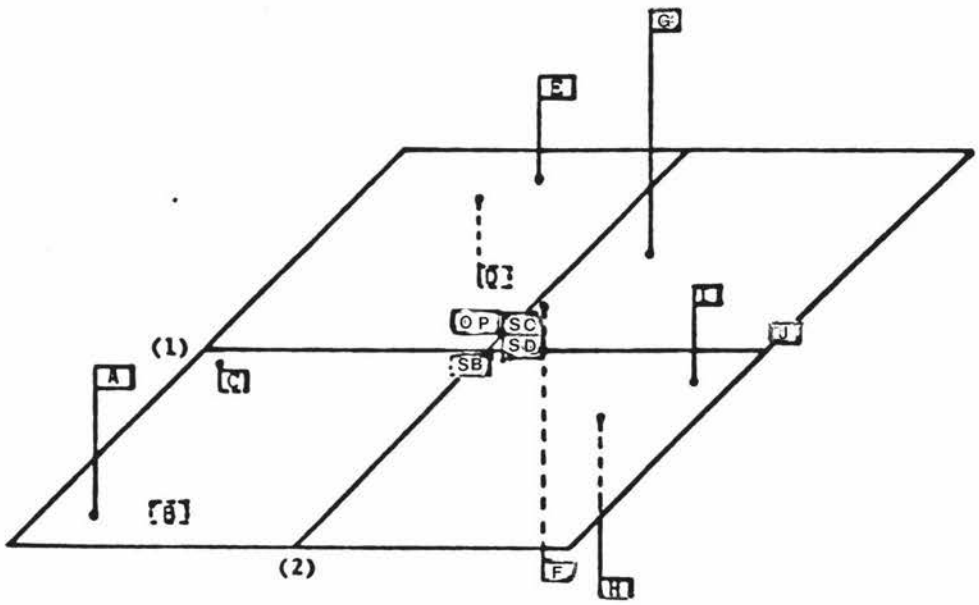


Figure 14.3 - Ideal points of four scenario-dependent preferences of 10 subjects with complete responses, in three dimensions
Group A

Table 14.5 - Ideal points for 10 subjects with complete responses

	1	2	3
Scenario A	0.008104	-0.063193	0.069122
Scenario B	0.046823	0.051942	-0.016947
Scenario C	0.101660	0.045801	0.157720
Scenario D	0.131230	0.083497	0.129410

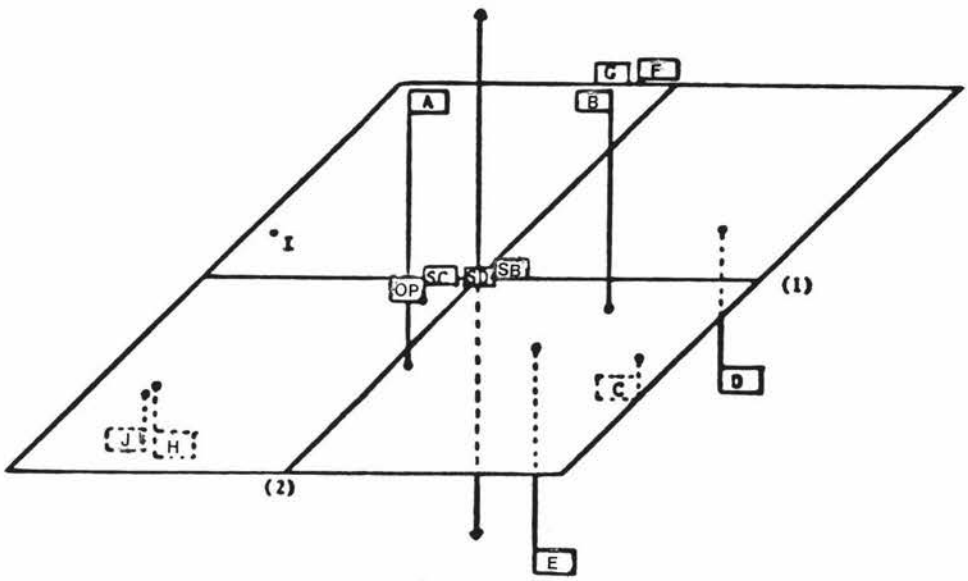


Figure 14.4 - Ideal points of four scenario-dependent preferences of 10 subjects with missing values, in three dimensions
Group B

Table 14.6 - Ideal points for 10 subjects with missing values

	1	2	3
Scenario A	-0.101010	0.110090	0.065619
Scenario B	0.051916	-0.007498	0.051526
Scenario C	-0.044618	0.018999	0.032075
Scenario D	-0.032177	0.040810	0.061923

	Scenario A (OP)	Scenario B (SB)	Scenario C (SC)	Scenario D (SD)
Average Subject	0.92	0.74	0.94	0.91

In the configuration of group A (Figure 14.3) the ideal points are close to point 'F' in the two-dimensional plane (1,2). The 3rd coordinate differs, but as it was stated in the study of the vectorial model, the third dimension corresponds to extrinsic attributes like price and availability. The positive direction is "cheap" and the negative direction is "expensive". Therefore, the ideal points are obviously not close to 'F' and 'H' (very expensive wines) in the third dimension. The positive coordinates of the ideal points in this third dimension show the desire of the respondents for wines of more reasonable prices, but at the same time show their willingness to pay for quality. The preferences of this group of more knowledgeable respondents differ from the preferences of the total group. The wine closest to their preferences is Cabernet Sauvignon.

14.3.2 - Ten subjects with missing values - Group B

Ideal points have been plotted only in the three-dimensional configuration of direct similarities of the 10 subjects who could not complete the questionnaire.

The coordinates of the ideal points for the 4 scenario-dependent preferences are shown in Table 14.6, and the correlation coefficients of the average subject for each one of the scenarios are as follows:

	Scenario A (OP)	Scenario B (SB)	Scenario C (SC)	Scenario D (SD)
Average subject	0.80	0.76	0.92	0.85

In this group some of the respondents had never tasted one or two of the wines from the list, mainly the wines from classical varieties like Pinot Chardonnay and Cabernet Sauvignon. Therefore, preferences as shown in Figure 14.4 are close to the wines respondents knew like Hock, Spritzig, Rose, and Burgundy.

14.4 - Summary

Average ideal points, which are hypothetical ones that optimise scores of all the subjects on overall preferences, have been plotted in the perceptual maps of stimuli. These average ideal points obtained from data from the third part of the questionnaire happen to be located in empty spaces for both configurations - 2 and 3 dimensions. This means that none of the wines of the sample completely satisfies consumer desires and preferences. The closest wines to the overall ideal point are Cabernet Sauvignon and Burgundy in the two-dimensional configuration and Hock in the three-dimensional one. Three other ideal points have been fitted in the same configurations corresponding to 3 different specific scenarios.

The correlation coefficient between data and squared distances - goodness of fit - and the coefficient of concordance showed a high level of agreement among subjects.

CHAPTER 15

UNFOLDING ANALYSIS

15.0 - Introduction

The unfolding analysis will serve two main purposes: to test through the geometrical space configuration the agreement among the subjects and to identify, if they exist, some dissenting respondents or groups of respondents in order to relate them to their background characteristics.

The KYST programme has been used for the unfolding model of the perceptual configuration. The evaluative configuration, PREFMAP2 phase 3, in its non-metric option has been considered the most appropriate programme.

The computer input for the unfolding analysis of similarity data is as in Appendix Q.

15.1 - Perceptual map

The unfolding solution in KYST requires the use of stress formula 2 as otherwise a meaningless zero-stress solution may be possible.

$$\text{STRESS} = \frac{\sum_{M=1}^{MM} [\text{DIST}(M) - \text{DHAT}(M)]^2}{\sum_{M=1}^{MM} [\text{DIST}(M) - d_o]^2}$$

where d_o is the arithmetic average of the distance values in SFORM2, whereas d_o was equal to 0 in stress formula 1 (Sections 10.7.1 and 10.11).

No pre-iterations were performed in this run and 50 iterations were used to reach a 0.158 stress solution (SFORM2).

The final configuration included 65 points of which 45 represent the pair by pair comparisons of wines and the other 20 represent the subjects' perceptional map (Figure 15.1).

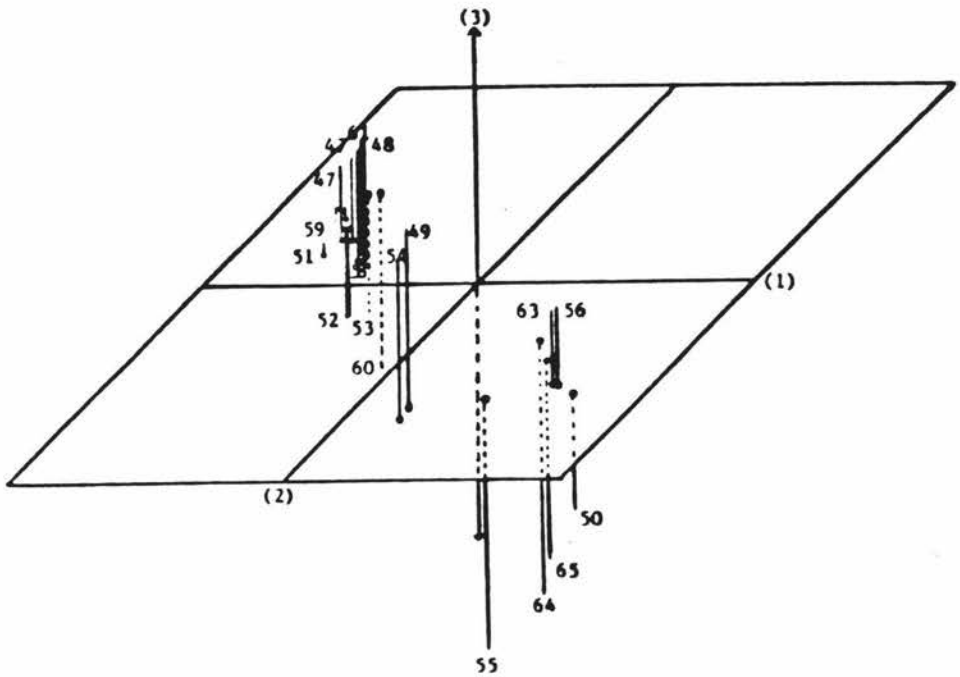


Figure 15.1 - Perceptual map of 20 subjects in three dimensions

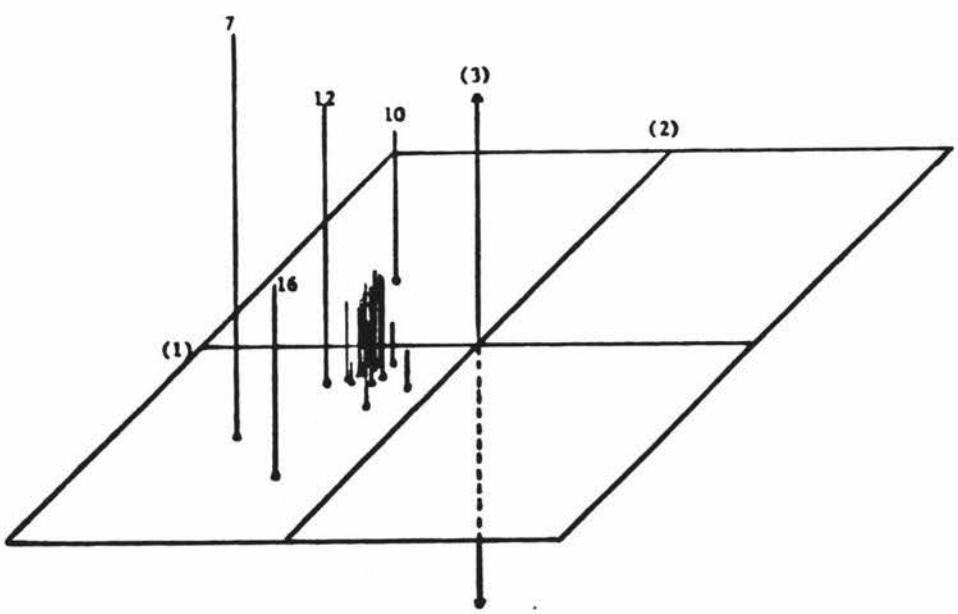


Figure 15.2 - Evaluative map of 20 subjects in three dimensions

The subjects' perceptional map shows one compact group of 10 subjects whose perceptions of wines are very similar, and another loose group of 10 subjects whose perceptions are slightly different. The main characteristic of the compact group is that it contains subjects who were able to complete the questionnaire. The points that are more spread apart belong to subjects who lacked knowledge of some of the wines and therefore had missing data in their matrices of perceptional values.

15.2 - Evaluative map

PREFMAP2 gives an unfolding solution as well as the aggregate one with the same form of computer input that has been used before for the study of preferences (Appendix Q).

Figure 15.2 shows the position of each subject's ideal point in the three-dimensional configuration. The agreement among subjects is demonstrated by the close location of the points. Only 4 of the respondents show some disagreement. Two of them (numbers 7 and 16) are close to the varieties of Pinot Chardonnay and Pinotage, whereas number 10 is closer to Spritzig and Premiere Cuvee. Number 12 is close to the group of points in the (1,2) dimensional plane. The third dimension in its negative direction corresponds to high price, therefore it is not surprising that none of the subjects' ideal points is positioned in this direction. The high points in the positive direction of the third dimension indicated a preference for cheaper wine.

The 4 points that stand higher in the third dimension suggest that the ideal wine for these subjects is one with a very low price. However, 2 of these 4 points are close to the classical varieties in the two-dimensional plane expressing a desire for good quality wine at a lower price. These 4 subjects were females. Only 7 subjects in the sample were women, and 4 of them wanted to see the price of the wine substantially reduced. It appears that men are more prepared to pay a high price for wine than are women.

15.3 - Summary

Perceptual and evaluative maps of 20 subjects have been represented on three-dimensional configurations. The perceptual map is formed with the 20 subjects' ideal points based on the individual perceptions. The evaluative map is formed with the 20 subjects' ideal points based on the internal analysis of their preferences. Both configurations give one point per subject and both reveal a high level of agreement among subjects, shown by the compact grouping of subjects. The preference level of agreement is higher than that for perceptions.

CHAPTER 16

SUMMARY OF CONSUMER STUDY AND SUBSEQUENT MARKETING INNOVATIONS

16.0 - Summary of findings - Multidimensional scaling

The final conclusions have to be related to the primary aims of the study and to the objectives defined in Chapter 11.

The first objective, which was to find out how products on the market were perceived by regular consumers, was reached through the analysis of direct and derived similarities. Position of the wines in the space, their interpoint distances and their distances to every vector give a measure of how every product in the study was perceived by the consumer. The products chosen in the study can be used as reference points for other products in the market that could not be included in the research. Emphasis has been deliberately put on types of wines rather than brands, so that any other wine of the same type can be assumed to be represented. An aim of this part of the study was to determine if some New Zealand wines could be substituted for overseas wines, especially sparkling wines. In the configurations of similarities Premiere Cuvee (medium) was never close to Gancia Asti Spumanti. This supports the view that the New Zealand wine market does not offer a close substitute for overseas sparkling wines. This area is neglected by the New Zealand winemakers as far as quality is concerned. The configuration of similarities shows that New Zealand Riesling is considered to be a close substitute for the German wine Blue Nun.

The second objective of the study, which was to learn about consumer preferences, was achieved through the analysis of preferences and unfolding analysis. The ideal points of the 20 subjects are predominantly enclosed in the space [coordinates: (-1)(-2)(+3)], which means that the wines favoured by the consumer are wines with pleasant taste and flavour, slightly dry (coordinate: -1), light (coordinate: -2) and inexpensive (coordinate: +3). The wines in the sample that best satisfied these characteristics were Mission Hock for the white wines and Cabernet Sauvignon for the red ones. Cabernet Sauvignon is close to the ideal point only in the configuration of the 10 more knowledgeable subjects and

it does not satisfy the third-dimensional attribute which is "inexpensive". The preference for classical varieties is related to the knowledge that the subjects have of wine. Knowledge and taste for wines of character are only acquired by experience, but the process can be directed and accelerated by education. Pinot Chardonnay was not favoured by some respondents because of the lack of knowledge of this particular type of wine. Its price has inhibited consumers from trying samples commercially available. The position of Pinot Chardonnay in the geometrical space shows that it is considered to be the driest of all wines in the sample, and to have pleasant taste and flavour. Its position in respect to the second axis means that it is considered very light, and its position in respect to the third axis means that it is considered dear. A drawback in the study of overall preferences has been that judgements had to be made among white and red wines at the same time. Usually respondents favoured one white and one red. As both types are quite apart in the configuration of similarities, the ideal points are somewhere in the middle of the interpoint distance between Cabernet Sauvignon/Burgundy, and Hock/Pinot Chardonnay.

The third objective could be only partly achieved, since it would not be accurate to generalise and say that the holes in the configuration mean gaps in the market, because not all types of wines in the current market have been covered by the study and the sample was both small and self-selected. However none of the wines in the study coincides with any ideal point.

The configuration of similarities and preferences, the outline of which was the fourth objective of the study, shows that the group of regular consumers found classical wines produced in New Zealand to be acceptable. Nevertheless it suggests the merit of making greater efforts to educate New Zealand consumers by offering them the opportunity to try these new vinifera wines at a more reasonable price. Other New Zealand wines included in the sample (e.g., Premiere Cuvee) did not fulfil consumer needs either in terms of quality or price. Wines produced in New Zealand which partially fulfil these requirements are either too expensive, or too often unavailable. Lack of knowledge of wines became manifest first in the general survey and later in interviews with the regular wine consumers. Lack of knowledge of what is available in the market was also apparent.

The objectives to experiment with the multidimensional scaling technique for consumer analysis have been accomplished. Multidimensional scaling could be a useful tool for the investigation of consumer perceptions and preferences of existing brands/types, and for testing consumer acceptance of new wines.

The testing of the vectorial model for the labelling of the axes has also been accomplished. The interpretation of the axes by the use of the vectorial model was based in this study on the respondents' judgements upon pre-specified sets of attributes. The vectorial mapping provided a visual representation of the properties of wines in the spatial configuration as perceived by respondents. For maximum congruence of labelling of the axes, appropriate rotation of the axes to principal vectors should have been attempted.

16.1 - Changing consumption patterns

An important piece of information from the general survey concerned changes in consumption. Twenty-two percent of wine users increased their consumption compared with the previous year, but 19% of wine users drank less wine. When the differences between quantities increased and quantities reduced were extrapolated to a national level, total consumption increase for the year 1975 was less than half the increase during previous years. Statistical figures which subsequently appeared corroborated this finding of stagnation in consumption for about 18 months to 2 years. More recent statistical data shows that consumption is increasing again at about the same rate as in the early 1970's.

Since the survey completion a change in consumption patterns has been reflected in the increasing proportion of table wine to total wine sales.

Changes in social drinking habits have taken place as wine becomes more socially acceptable as a beverage for mixed company and for use with food either in the family or at social gatherings. Also the use of wine is growing in acceptance as a symbol of social status associated with good living, affluence and culture. The Wine Institute is concerned about the effect that activities of the Alcohol Liquor Advisory Council (ALAC), the

Horn Committee and the New Zealand Planning Council can have on future consumption. However, it would appear that increased future levels of consumption largely depend on the price relativity of wine to alternative alcoholic beverages and on greater exposure and availability of wine through extension of distribution outlets (e.g., supermarkets).

16.2 - Packaging innovations

Since the survey was completed the wine industry has developed several new marketing strategies which have also contributed to increased consumption.

At the time of the survey there were 2 standard size containers for wine: the 750 ml bottle and the flagon (1/2 gallon). In recent years there have been a number of innovations mainly in packing and marketing of products. Soft packs (bag-in-the-box packaging) have taken over from two-litre glass containers, and the volume packaged in containers of 2.25 litres or more has risen by 170% from 1975. The expansion has been mainly due to the collapsible pack trade which includes 20 litre packs as well. The figures for 1981 were still not available at the time of writing this thesis but it was expected by the Wine Institute that the volume sold in large containers would be almost 50% of the total volume sold. This trend will probably increase the cost of 750 ml bottles because of smaller bottling runs.

There has also been a change towards more economic bulk packaging for fortified wines. This trend has been predominantly in bulk wine to cater for the "fill your own flagon" trade, and this has occurred to some extent at the expense of 750 ml bottles. New glass containers in several shapes and sizes have also appeared in the market in recent times (e.g., carafes, bottles of 1,500 ml). Since the middle seventies individual firms in the industry have become more marketing orientated and have displayed a variety of market strategies conducive to gaining consumer preference for their products.

16.3 - Summary

This chapter summarises the final conclusions of the consumer study

arrived at by the application of the multidimensional scaling technique. Changes in consumption patterns and subsequent marketing innovations have been also examined.

CHAPTER 17

SUMMARY AND CONCLUSIONS

17.0 - General

The primary objective of this thesis was to investigate production and distribution of wine in New Zealand to determine the effects of the industry's structure on consumer welfare.

Chapter 1 of this thesis established the basic theoretical background to assert that consumer welfare is maximised under a system of perfect competition provided that a strict set of assumptions is met and that a departure from the principles of pure competition indicates a departure from the maximisation of consumer welfare. These criteria have been used throughout the thesis as a value judgement of consumer welfare. The Industries Development Commission's appraisal of the New Zealand wine industry carried out in 1980 was based on similar criteria conducive to the improvement in the quality of domestic wines and the containment of prices so that consumer requirements could be met as satisfactorily as possible, and conducive to the improvement of utilisation of resources by increasing competition.

Subsequent chapters have investigated the structural development of the wine industry in New Zealand. Vertical and horizontal integration, which exist at several stages of the marketing system, confer market power to the integrated parts of the system. The degree of concentration at the production level provides an indication of oligopolistic industry structure. Although output and price agreements have not been evident, lack of price response to certain conditions of demand and supply serves as an indication of oligopolistic behaviour. The wine industry's conduct appears to be directed towards amalgamations and takeovers rather than towards agreements among firms.

Government policy of industry protection against imports has allowed the maintenance of prices at higher levels than competitive levels under a system of free imports. Government policy on licensing has also provided conditions for existing firms to operate in a system with restricted

entry. Higher consumer prices and low product quality (e.g., product adulteration) have been the results of the industry's performance, operating under a system of protection and limited competition.

In order to investigate consumer perceptions of New Zealand and overseas wines and to estimate consumer requirements and preferences, a consumer survey which involved a randomly selected sample of 237 respondents was carried out. Results from the consumer survey showed that wine prices were an important consideration in consumers' buying patterns which may have contributed to lower increases in consumption. Non-regular wine consumers were moderately satisfied with the quality of New Zealand wines available on the market. Regular consumers, who were more knowledgeable about wines, were more critical of New Zealand wines and some stated their preferences for overseas wines. The survey identified a group of regular consumers who were individuals with similar socioeconomic status and were responsible for more than half of the total wine consumption. A pilot study using the multidimensional scaling technique provided a visual representation of consumer perceptions of wine similarities and of consumer preferences for the wines in the sample. Results suggested that taste, quality and price were important considerations in consumer choice. The study also showed that the wines in the sample were not close to any of the consumer preference points and that there were no close substitutes for some types of imported wines, mainly sparkling wines. It appeared that regular consumers accepted the local products with quality and production potential in New Zealand. Regular consumers, however, were resistant to trying highly priced wines and to increasing their wine consumption.

17.1 - Industry protection versus consumer protection

Government policies on the protection of industries are based on the industry's potential for contributing to New Zealand's economic growth either by import substitution or by export of products. For this reason the government provides incentives to encourage that industry's development. Long term government protection from competition tends to produce inefficient performance in allocation of resources.

It is expected that economic incentives brought about by government protection would attract investment in the protected industry either from local or overseas investors, and that the industry would expand. Government incentives can induce producers to increase their output. If that is the case and if consumption increases at a lower rate than production, these increments in output can lead to problems of oversupply. If the industry has an oligopolistic structure the largest firms in the industry would have the power to cut down output and maintain prices. Individual enterprises could also resort to correcting the situation by lobbying for more economic incentives or increased government protection and by opting to amalgamate with other firms in order to gain more market power. In this latter situation government policies for protection of public interest have to be implemented in order to protect consumers against abuse of oligopoly power. On the one hand government industry regulations create the appropriate environment for the industry's growth and for the individual enterprises to gain market power, while on the other more government regulations have to be implemented in order to stop abuse of power against public interest. Government policies for consumer protection usually regulate trade practices and production and marketing practices (quality and information).

In New Zealand the expansion of the wine industry has been clearly related to government protection and support for the developing industry. Government protective measures have often been preceded by intensive industry lobbying. The New Zealand Viticultural Association which was formed in 1912 played a major role in pressing for industry protection. The Association asked for licensing of winemakers which was introduced in 1914. In 1918 the Industries Committee reported in favour of the protection of the industry. However, it was not until the election of a Labour Government in 1935 that official encouragement was given to the industry. Since then expansion of the wine industry has been considered to be in the national interest. Limitation of imports of overseas wine by the Import Control Regulations of 1938 gave impetus to the industry's expansion. The result was that from 1940 to 1950 the area in established vineyards increased by more than 300%. After that sudden growth, the area planted in grapes remained stable until 1968. When Government support for the wine industry was again formally expressed in the 1968 Budget the

industry embarked on a greater process of expansion. However, increases in demand slackened in the early 1970's and the industry faced a period of oversupply. Winemakers continued government lobbying with stronger emphasis on industry protection from overseas competition which resulted in another set of import controls in 1973.

Government protection attracted foreign investment into the industry, mainly over the last decade. Breweries also invested in the winemaking and distribution sectors of the wine industry. The industry's growth has repeatedly been stimulated by government policies which have secured the industry a market protected from overseas competition.

Mergers and takeovers which have resulted in vertical and horizontal integration have contributed to the formation of a powerful group with control over the market forces. Oligopoly power has developed through a combination of factors related to government protection and industry structure which resulted in consumer wine prices at higher levels than competitive market prices. The adulteration of some New Zealand wines, evident from statistical findings and substantiated by the Consumer Institute analysis of New Zealand wines, has probably been a result of a combination of factors including lenient regulations concerning wine-making, lack of competition and perhaps, as well, a response to consumer acquiescence.

A large component of the consumer wine price is the distribution margin, which the Industry Development Commission (IDC) report referred to as higher than justifiable. Lack of information on the breakdown of distribution costs precluded an analysis in this area. However, there have been indications given by other distribution channels (supermarkets) that only a 12.5% margin is needed, instead of the 47% which distributors add at present. The IDC report recommended cost containment through greater competition. The IDC plan identified four elements in the consumer price which should be subjected to some degree of constraint: cost of grapes, cost of packaging, sales tax and cost of distribution. The recommendations of the Commission were directed towards the containment of costs through greater competition in the distribution system and through the liberalisation of imports. These recommendations concerning the opening up of competition have not been approved by

government.

Other current government regulations attempt partially to correct some of the results of the system which adversely affect consumer interest. The 1980 Food and Drug Regulations regulate the amount of water and other additives wine can contain. They also require that wine labelling should provide accurate information for the consumer.

Regulations against abuse of power through trade practices are also intended to preserve the public interest. Their implementation does not, however, always provide the necessary protection to preserve competition by preventing takeovers as they are still permitted under certain circumstances.

The consumer analysis shed some light on the level of consumer satisfaction in respect to New Zealand wines. Findings from the consumer survey indicated that consumers considered price to be an important factor of their buying patterns and that high prices deterred them from increasing their wine consumption. Wine was considered as a luxury item and not as a commodity.

Consumers who did not have much knowledge of wine and who did not consume wine regularly accepted New Zealand wines (quality and price) better than consumers with a more educated taste.

Results from the application of multidimensional scaling to a group of regular consumers showed that for some types of wines (e.g, sparkling) New Zealand products did not offer any substitutes for overseas wines. A New Zealand Riesling, however, could be considered as a close substitute for a German wine. No wines in the sample were close to any of the consumer preference points. Cabernet Sauvignon was close to an "ideal preference point" but it did not satisfy the condition of price. These findings indicated a low level of consumer satisfaction. In general, it can be concluded from the pilot study that the New Zealand wines chosen in the sample did not totally fulfil the requirements of the selected group of consumers, either in quality or in price.

The general conclusions to be drawn from this study are that government

protection from overseas competition has given impetus to the expansion of the wine industry and that government legislation on licensing has contributed to the development of the industry's oligopolistic structure. As a consequence of lack of competition and oligopolistic market conditions, the results of the industry's performance have not met consumer requirements satisfactorily. If consumer interest is to be protected there is a need for freeing the market through liberalisation of import policies and licensing laws towards a more competitive system.

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Quote from a page: e.g., (Aaker 1971:51)

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APPENDIX A

TABLES

Table A.1 - Wine Production

Years 1960 to 1970	60-61	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70
Grape Juice	-	-	20	22	32	105	95	-	159	500
Table wine	550	732	1000	1200	1642	2028	2805	3850	4810	5705
Dessert wine	3628	4469	5001	6092	6132	6555	7369	9651	11574	13156
Total wine from grapes	4178	5201	6001	7292	7774	8583	10174	13501	16384	18861
Fruit table wine	59	50	64	77	86	155	150	286	405	423
Fruit dessert wine	177	232	100	127	123	177	123	45	182	236
Total fruit wine	236	282	164	204	209	332	273	331	587	659
Total table wine	609	782	1064	1277	1728	2183	2955	4136	5215	6128
Total dessert wine	3805	4701	5101	6219	6255	6732	7492	9696	11756	13392
Total New Zealand wine	4414	5483	6165	7496	7983	8915	10447	13832	16971	19520

Years 1971 to 1980	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80
Grape Juice	873	305	359	268	-	-	-	-	-	-
Table wine	8042	10133	16188	17320	13257	13666	-	-	-	-
Dessert wine	15235	13465	16211	14656	11154	12829	-	-	-	-
Total wine from grapes	23277	23598	32399	31976	24411	26495	-	-	-	-
Fruit table wine	450	718	1050	355	174	148	-	-	-	-
Fruit dessert wine	250	200	255	114	187	16	-	-	-	-
Total fruit wine	700	918	1305	469	361	164	-	-	-	-
Total table wine	8492	10851	17238	17675	13431	16777	20616	24471	28646	33523
Total dessert wine	15575	13665	16466	14770	11341	13175	14669	15795	13460	12578
Total New Zealand wine	24067	24516	33704	32445	24772	29952	35285	40266	42106	46101

Source : Monthly Abstract of Statistics
Unit : (000) litres
Years : 1960-61 to 1979-80

Table A.2 - Local vineyard area in New Zealand

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1972	1975	1980
Areas														
Bearing	387	407	437	451	484	489	526	577	672	769	-	-	1461	-
Non bearing	69	70	43	33	81	89	102	131	377	464	-	-	870	-
Total hectares	456 (388)	477	480	484	565	578 (507)	628	708	1049	1233	1468	1762	2331	4500

( ) Figures given in the 1975 Survey

Source : Monthly Abstract of Statistics
Unit : Hectares
Years : 1960 to 1980

Table A.3 - Grape production and other inputs

Years 1960 to 1970	60-61	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70
Fresh grapes (tonnes)	4759	5793	6102	6763	7393	7683	9300	11738	14211	16742
- From own vineyard	4565	5333	5802	6374	6989	7245	8770	10755	13047	15192
- Purchased	194	460	300	389	403	438	530	984	1164	1550
Sugar (includes distillation wash) (tonnes)	1820	2314	2638	2936	3349	4240	4351	5272	6530	7648
Fortifying spirits (000) litres	341	427	473	491	423	468	527	714	746	650

Years 1971 to 1979	70-71	71-72	72-73	73-74	74-75	75-76	78-79	1985-86
Fresh grapes (tonnes)	22285	28465	29422	-	-	24013	38212 (8)	(74.9 to 78.7) (x)
- From own vineyard	17702	20379	20952 (a)	-	-	15645	15000 (8)	
- Purchased	4583	8086	8471	-	-	8368	23000 (8)	
Sugar (includes distillation wash) (tonnes)	9593	10249	11436	-	-	-	-	
Fortifying spirits (000) litres	959	977	1346	-	-	-	-	

(8) Wine Institute estimates - October 1979 Report
(x) Data from the Report of the Industries Development Commission (000 tonnes)
(a) Data from the New Zealand Journal of Agriculture

Source : Monthly Abstract of Statistics
Units : (000) litres; tonnes
Years : 1960-61 to 1978-79

Table A.4 - Stocks

Stocks at end of season	59-60	60-61	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70	70-71
New Zealand	8033	8165	8874	9788	11347	12892	13802	14975	18139	22403	27085	33254
- matured wines	3941	3800	3505	3692	4041	6196	6496	6401	7974	8960	10229	11647
- new wines	4091	7365	5369	6096	7305	6696	7305	8574	10165	13443	16856	21607
Total grape juice	32	23	18	14	9	14	50	59	55	45	50	118
Stocks at beginning of season	7842	8033	8160	8942	9810	11333	12752	13933	14938	18152	22121	27435
- matured wine	4128	3941	3810	3514	3728	4010	6228	6769	6383	8056	8897	10210
- new wines	3714	4091	4351	5428	6082	7324	6524	7164	8556	10097	13224	17225
- grape juice	27	32	23	18	9	55	23	50	59	55	18	59

Stocks at end of season	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80
New Zealand	-	-	-	-	45666	49269	51400	54222	55137

Source : Monthly Abstract of Statistics
Unit : (000) litres
Years : 1960-61 to 1978-79

Table A.5 - Sales of New Zealand wines

Years 1960 to 1970	60-61	61-62	62-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70
Grape Juice	36	14	23	18	32	68	68	100	168	73
Table wine	-	-	-	-	-	-	-	2482	3064	3755
Dessert wine	-	-	-	-	-	-	-	7487	18910	10215
Total wine from grapes	3864	4205	4837	5496	6005	7305	18815	19969	11974	13970
Fruit table wine	-	-	-	-	-	-	-	287	287	391
Fruit dessert wine	-	-	-	-	-	-	-	0	77	82
Total fruit wine	136	191	832	148	178	196	222	287	364	473
Cocktail and Liqueurs	-	-	-	-	-	-	-	-	-	-
Total table wine	-	-	-	818	1077	1600	2269	2769	3351	4146
Total dessert wine	-	-	-	4826	5106	5901	6768	7487	8987	10297
Total sales of N.Z. wine	4000	4396	5037	5644	6183	7501	9037	10256	12338	14443

Years 1971 to 1980	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80
Grape Juice	127	177	714	282	-	-	-	-	-	-
Table wine	5160	7233	10233	11234	11782	12425	-	-	-	-
Dessert wine	12315	12492	12597	13743	12004	12667	-	-	-	-
Total wine from grapes	17475	19725	22830	25067	23786	25092	-	-	-	-
Fruit table wine	359	427	459	355	240	356	-	-	-	-
Fruit dessert wine	159	169	177	185	160	79	-	-	-	-
Total fruit wine	518	656	636	540	400	435	-	-	-	-
Cocktails & Liqueurs	-	-	-	-	-	-	339	215	631	516
Total table wine	5519	7660	10692	11679	12022	12782	15161	20170	22183	27766
Total dessert wine	12474	12661	12774	13929	12164	12746	12684	14747	11688	12468
Total sales of N.Z. wine	17993	20321	23466	25607	24186	25527	28184	35132	34502	40750

Source : Monthly Abstract of Statistics
Unit : (000) litres
Years : 1960-61 to 1979-80

Table A.6 - Imports of wine

Years 1963 to 1974	63-64	64-65	65-66	66-67	67-68	68-69	69-70	70-71	71-72	72-73	73-74
Champagne	23	27	24	24	27	39	36	39	49	38	65
Sparkling wine	203	350	390	299	521	524	504	438	599	675	704
Wines >25% (b)	366	382	394	347	476	545	577	668	877	1048	1366
Wines >25% (p)	4	5	9	3	5	11	2	3	6	11	11
Wines <25% but >40% (b)	84	87	75	56	54	96	94	109	117	156	148
Wines <25% but >40% (p)	299	214	336	128	127	162	151	138	152	140	188
Vermouth >40%	72	75	108	74	104	123	152	130	204	187	230
Totals	1051	1140	1336	932	1315	1510	1516	1525	2005	2265	2712

Years 1974 to 1979	74-75	75-76	76-77	77-78	78-79	79-80
Totals	-	2020	-	-	1800	

(b) Bottles (p) Otherwise packed (-) Percentages indicate proof

Source : New Zealand Statistics - Exports and Imports
Unit : (000) litres
Years : 1963-64 to 1978-79

Table A.7 - Exports of New Zealand wine

Years	Quantity (000) litres	F.O.B. Value (000) NZ$
1966-67	4	3
1967-68	12	5
1968-69	25	11
1969-70	60	40
1970-71	45	25
1971-72	80	42
1972-73	154	79
1973-74	289	116
1974-75	224	135
1975-76	285	252
1976-77	265	290
1977-78	309	370
1978-79	289	394
1979-80	296	413

Source : N.Z. Statistics - Exports and Imports
Unit : (000) litres and (000) NZ$
Years : 1966-67 to 1979-80

Table A.8 - Wine consumption

Year ending 30th June	Table Wines Domestic	Table Wines Imported	Fortified Wines Domestic	Fortified Wines Imported	Total Wines	% Imported
1963	6042	5950	44294	5172	61458	18.1
1964	8178	5958	48395	4551	67082	15.7
1965	10774	7642	51052	3754	73222	15.6
1966	16002	8169	59053	5192	88416	15.1
1967	22685	6732	67644	2586	99647	9.4
1968	27685	10296	74873	2852	115706	11.4
1969	30640	11189	89102	3821	134752	11.1
1970	37550	11184	102149	3974	154857	9.8
1971	51597	11478	123151	3767	189993	8.0
1972	72327	15314	124924	4734	217299	9.2
1973	102330	17814	125970	4833	250947	9.0
1974	112440	21461	135400	5664	274965	9.8
1975	117190	22140	118450	4430	262210	10.1
1976	144950	16100	129590	4060	294700	6.8
1977	167460	15690	129640	1930	314720	5.6
1978	195990	14370	125220	1750	337330	4.7

Source : Department of Statistics, Auckland
Unit : Hectolitres
Years : 1963 to 1978

Table A.9 - Consumption per capita

Year ending 30th June	Population	Total Table Wines (000) ltrs	Total Fortified Wines (000) ltrs	Per Capita consumption (ltrs) Table	Fortified	Total
1963	2,527,868	1,119	4,947	0.47	1.96	2.43
1964	2,582,407	1,414	5,295	0.55	2.05	2.60
1965	2,628,910	1,842	5,481	0.70	2.08	2.78
1966	2,676,919	2,417	6,425	0.90	2.40	3.30
1967	2,725,914	2,995	7,023	1.08	2.58	3.66
1968	2,752,662	3,798	7,773	1.38	2.82	4.20
1969	2,777,210	4,183	9,292	1.51	3.35	4.86
1970	2,852,137	4,873	10,612	1.71	3.72	5.43
1971	2,899,067	6,306	12,692	2.18	4.38	6.56
1972	2,909,916	8,764	12,966	3.01	4.46	7.47
1973	2,974,659	12,014	13,080	4.04	4.40	8.44
1974	3,030,600	15,146	13,166	5.00	4.35	9.35
1975	3,089,000					8.60
1976	3,124,500					8.80
1977	3,140,400					9.70
1978	3,145,900					10.30
1979	3,144,700					-
1980	3,148,400					11.10

Source : Department of Statistics, Auckland
Unit : (000) litres and litres
Years : 1963 to 1980

Table A.10 - Growth rates from 1960 to 1980

Variable	Linear regression		
	a	b	r^2
Vineyard	-1.1319	0.4809	0.93
Grape production	-0.0539	0.3915	0.94
Wine production	-0.3661	0.5024	0.96
Table wine production	-9.9290	2.6906	0.95
Dessert wine production	1.2579	0.1568	0.83
Sales	-0.5565	0.4753	0.98
Stocks	-0.0004	0.3591	0.98
Consumption	-0.4905	0.3863	0.98
Consumption per capita	1.3	0.5658	0.98

Variable	Exponential regression		
	a	b	r^2
Vineyard	0.6842	0.13	0.98
Grape production	0.9325	0.12	0.98
Wine production	1.6761	0.12	0.97
Table wine production	1.0782	0.21	0.98
Dessert wine production	1.3200	0.06	0.85
Sales	0.9251	0.12	0.99
Stocks	0.9362	0.11	0.98
Consumption	0.8385	0.12	0.99
Consumption per capita			

Variable	1986 Estimates	
Vineyard	5,368	hectares
Grape production	50,064,000	kg
Wine production	55,149,000	litres
Table wine production	34,490,000	litres
Dessert wine production	19,917,000	litres
Sales	47,411,000	litres
Stocks	77,839,000	litres
Consumption	46,991,000	litres
Consumption per capita	14.89	litres

x= time (years); y = variable

Linear regression : $y = a + bx$

a (lin) = y intercept
b (lin) = average annual absolute increase

Exponential function : $y = a \cdot e^{bx}$; $\ln y = \ln a + bx$

a (exp) = y intercept
b (exp) = average percentage annual increase

APPENDIX B

Grape varieties

APPENDIX - B

Varieties of Grape

Variety	Characteristics
White Wines	
Chasselas	A low cropper, giving a delicate white wine, low in alcohol and acidity.
Palomino	A good cropper of Spanish origin, giving a rather ordinary wine, but producing the finest quality dry sherries.
Pedro Ximenez	Classic sherry grape of Spanish origin.
Baco	An American hybrid, of which there are various strains, producing both fortified and unfortified white wines.
Pinot Chardonnay	The white grape of Burgundy, Chablis, Meursault and Montrachet. It gives a clean fresh white wine and can be used as the base of good sparkling wines.
Rhine Riesling (Riesling)	A poor cropper of Austrian origin giving wines which are always good and take on a character of richness and lusciousness with age.
Muller Thurgau (Riesling/Sylvaner)	Combination of the two German grapes, the Riesling and the Sylvaner, with the virtues of each. Widely planted in New Zealand, this species gives short-lived wines of initial fruitiness, but dull finish.
Semillon	The classic Sauterne grape. A heavy cropper, giving distinctive wines with pleasant grape character whose flavour develops markedly with age.
Sylvaner	Another German type. A heavier cropper than the Riesling, its wines while having good fruit character never reach the heights of a fine Riesling. It is comparatively easy to grow and an early ripener.
Traminer	A vine traditionally associated with Alsace, the Traminer gives pungent spicy wines which have a strong varietal character.
White Hermitage	Originally from the Hermitage district in France, this type is used for table wines.
Pinot Gris	It is an early grape, bears heavily and produces an excellent white wine.
Red Wines	
Grenache	Originally from the Côtes du Rhône this species is planted to produce ports, some rapidly maturing red wines and rose.
Pinot Noir	The classic species of Burgundy, giving wines of fine perfume and style, with a soft finish. A small cropper, it is often blended with wines from other grapes. It is also the principal variety used in the best champagne.
Pinotage	A South African cross of Pinot Noir and Ulliade. Gives wine of fruity character and medium body, with a light tannin grip.
Albany Surprise	Derived from an American hybrid, used in making red wine, both fortified and unfortified.
Pinot Meunier	Bears heavily and in normal seasons, produces a good crop of high class wine.
Cabernet Sauvignon	The classic dry red variety of Bordeaux. A low cropper, it produces a wine of tremendous character and breed which is slow to mature and soften.

Source: Bulletin 354 "Viticulture"
F. Berrysmith
Horticultural Advisory Officer
Department of Agriculture - Auckland

APPENDIX C

Ownership of wine companies

APPENDIX C

OWNERSHIP OF WINE COMPANIES

Penfolds Wines New Zealand Ltd. - 1981

List of major shareholders before Lion Breweries acquired 35% of company

Shareholders	Ordinary shares (4,750,320)
F.Yukich (*)	62,643
Castel Wine & Spirits Co Ltd [Owned by (*)]	3,012,314
Hughes & Cossar Ltd	96,000
McVicar Joseph (Bombay)	172,500
Penfolds Wines Australia	75,000
Phillips Pike Ltd	96,000
Thomas Wayne	109,800
Dominion Breweries	115,200

Subsidiary Companies 100% owned by Penfolds Wines NZ Ltd:

The Wine Goblet Ltd	Wine Reseller
Sylvana Wines Ltd	Wine Reseller
Redlock Holdings Ltd	Wine Reseller
Mocambo Wines (Ngaruawahia) Ltd	Wine Reseller
Tarawera Wines Ltd	Wine Reseller
Flora Nurseries Ltd	Plant Nurseries
O'Reilly Bros, Ltd	Wine & Spirits Merch
Estate Wines Ltd	Non Trading
Woodhill Vineyards Ltd	Non Trading

McWilliams Wines Ltd - 1981

Shareholders	Ordinary shares (350,000)
McWilliams Industries Ltd	349,998
McDonalds's Wines Ltd	2

McWilliams Industries Ltd

Shareholders	Ordinary shares (2,900,000)
McWilliams' Wines Pty Ltd Australia	971,844
Ballins Industries Ltd	833,010
Lion Breweries	699,730
Dominion Breweries	299,882
The Campbell & Ehrenfried Ltd	55,534
Hughes & Cossar Holdings Ltd	40,000

McDonnald's Wines Ltd

Shareholders	Ordinary Shares (200,000)
McWilliams' Industries Ltd	199,998
McWilliams' Wines (NZ) Ltd	2

(the same company director as McWilliams)

Montana Wines Ltd -1981

Shareholders (Major)	Ordinary shares (12,000,000)
Seagram Co Ltd. Montreal, Canada	4,800,000
Campbell & Ehrenfried Ltd (Owned by D.Myers)	590,063
K.B. Myers & A.D. Myers	243,529
M. Yukich	500,000
A.M.P. society No 2 A/C Wellington	356,400
NZ Insurance Co Ltd Trust Dept Auckland	309,254

(Company directors: A.D. Myers, M.V. Yukich and others)

Lion Breweries Ltd -1981

(Major shareholders prior to the acquisition of 20% by D. Myers)

Shareholders	Ordinary shares (52,008,981)
Bank of NSW Nominees NZ Ltd. Wllgton	5,932,832
Mrs Y.A.L. Carr, Auckland	1,563,554
Ballins Industries Ltd	1,303,215
AMP Society Wellington	853,000
South British Guardian Trust Co Ltd	843,232

Subsidiary companies owned partially by Lion Breweries:

	% Ownership
The Canterbury New Zealand Malting Company	72
The Canterbury Seed company Group	72
The Associated Bottlers Company Ltd	100
Glen Innes Hotel Ltd	53
Lane Thomson Ltd	100
Manurewa Hotel Ltd	53
New Zealand Breweries Ltd	100
New Zealand Wines and Spirits	50
J. Staples and Co Ltd	100
Taumarunui Hotel Ltd	75

Associate companies owned partially by Lion Breweries:

Associated Taverns Ltd	33
Caledonian Hotel (CH) Ltd	39
Inns of Canterbury Ltd	50
Leopard Breweries Ltd	50
McWilliams' Industries Ltd	24.5
Oasis Industries Ltd	12
Southern Cross Hotel (Dunedin)	29.4
Travelodge (N.Z.) Ltd	25

Dominion Breweries Ltd

Shareholders (Major)	Ordinary shares (44,909,508)
Alwyn Nominees Ltd - Auckland	1,074,667
Great Eastern Life Assce Co Ltd Singapore	1,180,000
AMP Society, Wellington	716,000
Bank of NSW Nominees NZ Ltd Wellington	589,632
BNZ Nominees Ltd Wellington	426,149

Subsidiary companies owned partially or totally owned by Dominion Breweries in 1981:

	% Ownership
Albert Motor Lodge ltd	63,6
Barraud and Abraham	94.4
Clyde Quay Tavern Ltd	100
DB Central Brewery Ltd	100
DB South Island Brewery Ltd	55
DB Taranaki Brewery Ltd	100
Fiztherbert Motor Inn Ltd	100
Frederick Motor Inn Ltd	100
Hardwicke &Robertson Ltd	100
Johnston & Co Ltd	100
Nelson Breweries Ltd	100
Nelson Hotels Ltd	100
New Commercial Properties Ltd	100
Southern Motels (NZ) Ltd	93.9
South Island Wine & Spirit Co Ltd	100
Tavern Developments Ltd	100
T. & W. Young Ltd	100
Westland Breweries Ltd	100
W. Scoular & Co Ltd	100

Associated companies partially owned by Dominion Breweries in 1981:

Canterbury (NZ) Malting Co Ltd	28
Canterbury (NZ) Seed Co Ltd	28
Coast Motels Ltd	26.25
Cloverlea Tavern Ltd	50
Dunedin Taverns Ltd	30
Fitzroy Hotel Ltd	50
Hastings Hotel Ltd	25
Hastings Hotel (Wellington) Ltd	25
Kapiti Tavern Ltd	20
H.W. Moss Ltd	25
Nelson Motor Lodge Ltd	40
Ocean Lodge Ltd	40
Ohakune Hotel Ltd	25
Raetihi Hotel Ltd	25
Raetihi Properties Ltd	25
Tahuna Tavern Ltd	40
Vogel Hotels Ltd	25
Waikanae Holdings Ltd	25

APPENDIX D

Herfindahl approximation

APPENDIX D

THE HERFINDAHL APPROXIMATION

$$H_i^* = \frac{1}{\Sigma_j \ell_{ij}^2} \Sigma_j \left(\frac{l_{ij}}{n_{ij}}\right)^2 n_{ij}$$

but $\ell_{ij} = \Sigma_{S_j} x_{ik}$ where S_j = size of group 'j'

hence $\frac{\ell_{ij}}{n_{ij}} = \Sigma_{S_j} x_{ik} / n_{ij} = {}_j\bar{x}_i$

and $H_i^* = \frac{1}{\Sigma_j \ell_{ij}^2} \Sigma_j \left({}_j\bar{x}_i\right)^2 n_{ij}$

Consider size group j

The Herfindahl index uses $\Sigma_{S_j} \left(x_{ik}\right)^2$

the approximation uses $\left({}_j\bar{x}_i\right)^2 n_{ij}$

Let $x_{ik} = {}_j\bar{x}_i + u_k$

$$\therefore \Sigma_{S_j}\left(x_{ik}\right)^2 = \left({}_j\bar{x}_i\right)^2 n_{ij} + 2\left({}_j\bar{x}_i\right) \Sigma_{S_j} u_k + \Sigma_{S_j} u_k^2$$

$$\Sigma_{S_j} u_k = 0$$

$$\Sigma_{S_j} u_k^2 \geq 0$$

$$\therefore \Sigma_{S_j}\left(x_{ik}\right)^2 \geq \left({}_j\bar{x}_k\right)^2 n_{ij}$$

Hence the approximation equals or understates the true index value.

A P P E N D I X E

Questionnaire to consumers

A P P E N D I X - E

SURVEY ON WINE CONSUMPTION AND CONSUMER PREFERENCES

(Fill in before attempting to contact respondent)

Date ..../....75 Questionnaire number .....
Time to begin ..... am/pm Interviewer number .....

- -

INTRODUCE YOURSELF: Hello. I am ..... from .....
We are undertaking a survey on wine and I would like to ask some questions concerning wine use by your family. Could I speak to the person who usually purchases the wine for your household?

(To the person concerned)
Would you be prepared to answer some questions?
Before starting with some questions about wine consumption, I would like to make sure that we both have the same idea of what wine is. Under the "Food and Drug Regulations" wine is defined as the "alcoholic fermentation of the juice or must of grapes". In this survey we are using this definition. It includes unfortified wines such as still table wines (white and red), rose and sparkling wines, as well as fortified wines such as sherry, port, madeira and muscatel. It does not include spirits such as whisky, gin, brandy and liqueurs.

SECTION I - WINE CONSUMPTION AND CONSUMER PREFERENCES

Q. 1 - Do you ever drink wine? (Tick appropriate box) Yes.. No..
(If the answer is "no" go to Q.2)
(If the answer is "yes" go to Q.3)

Q. 2 - Would you mind telling me your reasons for not drinking wine?
(Note what respondent answers spontaneously and go to Section II) .....

Q. 3 - About how frequently do you drink wine?
(Tick appropriate box) - At least once a day ...(Go to Q.5)
" " " " week ...(Go to Q.5)
" " " " month...(Go to Q.5)
Less often than once a month...(Go to Q.4)

Q. 4 - In which of the following circumstances did you drink wine during the last year?
(Show card - 1 to the respondent. Tick the appropriate boxes among the ones listed below. If "Others" is answered ask the respondent to specify them. Go to Q.6)

Before every-day meals .....
With every-day meals .....
After every-day meals, during evenings at home .....
With meals shared with guests (either at home or at host's home) .....
At parties (either at home or at host's home) .....
At special celebrations .....
At the pub .....
At restaurants .....
Others .....

Q. 5 - About how many times a month, on average, do you drink wine in each of the following circumstances?
(Show the respondent card - 1 and note the number of times in each one of the boxes listed below. If none or less often than once per month, note "0". If "Others" is answered ask the respondent to specify them).

Before every-day meals .....
With every-day family meals .....
After every-day meals, during evenings at home .....

With meals shared with guests (either at home or at host's home) .....
At parties (either at home or at host's home) .....
At special celebrations .....
At the pub .....
At restaurants .....
Others .....

Q. 6 - Do you ever use wine for cooking? Yes ... No ...
(Tick appropriate box. If "Yes" go to Q.7, if "No" go to Q. 8).

Q. 7 - About how often do you use wine for cooking?
(Tick appropriate box)

Every day .....
Once a week .....
Once a month .....
Less often than once a month .....

Q. 8 - Do you ever use wine when preparing fruit salads?
Yes ... No ...
(Tick appropriate box)

Q. 9 - About how often do you use wine in your fruit salads?
(Tick appropriate box)

Every day .....
Once a week .....
Once a month .....
Less often than once a month .....

Q.10 - As far as you, yourself, are concerned, which of the types of wines on this list do you drink in the greatest quantity - not the one you drink most often - but the one that you drink in the greatest quantity? Now, would you rank the other types of wines in the same way? We need to have this information for only 5 types of wine. I should perhaps point out that we are interested in your total consumption of wine, not just the wine you drink at home.
(Show card - 2 to the respondent. Mark only 5 types of wine among those wines listed below and give them a number from 1 to 5 by order of decreasing consumption,

i.e. mark with a "1" the type of wine the respondent drinks the largest quantity; a "2" should be placed alongside the wine which is second in terms of the quantity consumed by the respondent, and so forth. If the respondent does not consume 5 different types of wines, mark in the way described the types of wines that he/she consumes).

Code	Types of Wine	
1	Still white table wine	.....
2	Still red table wine	.....
3	Rosé wines	.....
4	Sparkling wines	.....
5	Dry Sherry	.....
6	Medium Sherry	.....
7	Sweet and cream sherry	.....
8	Port wine	.....
9	Madeira or Muscatel	.....

Q.11 - Why do you consume more ..... than any other type of wine?
(Fill up the pause with the type of wine the respondent mentioned as most consumed, and note his/her response concisely and accurately).

Because .....

Q.12 - In general, which wines do you like best, New Zealand or overseas?
(Tick appropriate box)

Overseas wines .... (Go to Q.13)
New Zealand wines .... (Go to Q.14)
No preference .... (Go to Q.15)

Q.13 - Can you name the countries whose wines you prefer?
(note response) .....

Q.14 - Why do you prefer ..... wines?
(Fill up the gap with the country mentioned by respondent either in Q.12 or Q.13 - note response concisely and accurately) .....

Q.15 - Now I am going to ask you some questions about particular types of wine. I would like you to tell me for each type of wine which brand, if any, you prefer, and why you prefer it. What I would like to know is how you, personally, assess the quality of these types of wine.

Firstly sherries: -

a) Which type and brand of sherry do you prefer?
(Identify type and brand as completely as possible. If no preferences go to c) .....

b) Why do you prefer that particular one?
(Note response concisely and accurately. Go to d).
.....

c) Why don't you like any sherry? .....

Secondly table wines:

d) Which type and brand of still white table wine do you prefer?
(Identify type and brand as completely as possible. If no preferences go to f). .....

e) Why do you prefer that particular one?
(Note response concisely and accurately and go to g).
.....

f) Why don't you like any white table wine?
(Note reasons for no preference) .....

g) Which type and brand of still red table wine do you prefer?
(Identify type and brand as completely as possible. If no preferences go to i). .....

h) Why do you prefer that particular red wine?
(Note response concisely and accurately, and go to j)
.....

i) Why don't you like any red wine?
(Note reasons for no preference) .....

j) Do you have any preferences for either a rose or a sparkling wine?
(Note type, name and brand of the wine or wines, if no preferences go to 1). .....

k) Why do you prefer it/them?
(Note response concisely and accurately, and go to m)
.....

l) Why don't you like rosé and sparkling wines?
(Note reasons for no preference). .....

Thirdly dessert wines, that is Port, Madeira or Muscatel:

m) Do you have any preferences for either a particular Port, or a Madeira or a Muscatel?
(Note type, name and brand of wine if there is a preference. If no preference go to o). .....

n) Why do you prefer the wine or wines you mentioned just now?
(Note the response concisely and accurately and go to Q.16). .....

o) Why don't you like any of them?
(Note reasons for no preference). .....

Q.16 - Do you have any difficulties in obtaining the particular types you want to buy from .....?
(Show the respondent card - 3 and tick appropriate boxes when answers were affirmative).

	New Zealand Wines	Overseas Wines
Wholesalers	...	...
Wine Shops	...	...
Hotels	...	...
Restaurants	...	...
Vineyards	...	

Q.17 - Would you mind giving me details of the type and quantity of wines you have in the house at the present time? (If the respondent does not recall this information, ask him/her to show you the stored bottles so as to answer this question. Note the types, brands and names of wine

that the respondent has at home as well as the number of bottles and flagons for each one of them. Use the number code from Q.10 to note the type of wines. If the respondent objects to your request to take the wine inventory, ask him/her Q.18. Omit Q.18 if you successfully complete the table below).

Type	Brand	Name	Number of Bottles	Number of Flagons
Total				

Q.18 - Would you tell me roughly how many bottles and flagons of wine you have in the house at the moment?
(Tick appropriate boxes).

	Bottles	Flagons
None	...	...
Less than 5	...	...
From 5 to 9	...	...
From 10 to 14	...	...
From 15 to 19	...	...
20 or more	...	...

Q.19 - On average, about how many bottles and flagons of wine do you buy each month?
(Tick appropriate boxes)

	Bottles	Flagons
1-3	...	...
4-6	...	...
7-9	...	...
10 or more	...	...

Q.20 - Thinking back to a year ago, would you say you are buying more wine, or less wine, or about the same amount as you were then?
(Tick appropriate box)

More wine than last year	...	(Go to Q.21)
Less wine than last year	...	(Go to Q.21)
The same amount	...	(Go to Q.22)

Q.21 - About how much more/less a month? .....

Q.22 - Why are you buying more wine / less wine / the same amount of wine now than you were last year?
(Note response concisely and accurately). .....

Q.23 - Now, I know it is always difficult to remember how much money you spend on things but could you tell me about how much you spend on wine during an average month?
(Note how many dollars or "Do not remember") $ ....

-And, how much money do you spend on beer during an average month?
(Note how many dollars or "Do not remember") $ ....

-And how much money do you spend on spirits during an average month?
(Note how many dollars or "Do not remember") $ ....

Q.24 - Has the amount you spent on wine decreased or increased over the past year, or is it about the same?
(Tick appropriate box)

Decreased	...	(Go to Q.25)
Increased	...	(Go to Q.25)
About the same	...	(Go to Q.26)

Q.25 - Why do you think that the amount you spend on wine has decreased/increased?
(Note response). .....

Q.26 - When you last had a meal in a licensed restaurant did you buy wine?
(Tick appropriate box).

Yes	...	(Go to Q.27)
No	...	(Go to Q.28)
Don't remember	...	(Go to Q.28)

Q.27 - Can you remember what type and brand it was?
(Note response). .....

Q.28 - Do you think advertising influences your choice of the wines you buy? How much?
(Tick appropriate box).

A great deal	...
Moderately	...
A little	...
Not at all	...

Q.29 - Do you buy every wine because it is under a special offer? How often?
(Tick appropriate box).

Never	...
Sometimes	...
Often	...
Very often	...
Always	...

Q.30 - Would you look at this list and tell me which of these beverages you drink every day, as a rule?
(Show respondent card - 4. Tick appropriate boxes. If "something else" is answered ask respondent to specify it).

Tea	...
Coffee	...
Milk (on its own)	...
Soft drink	...
Fruit juice	...
Beer	...
Spirits	...
Something else	...

- -

SECTION II - FAMILY'S CHARACTERISTICS

(Tick appropriate box)

Q.31, Q.32 and Q.33 can be observed, no direct questions are necessary).

Q.31 - Sex of the respondent	Male	...
	Female	...
Q.32 - Race of the respondent	Maori	...
	European	...
	Other	...
Q.33 - Age of the respondent	18 - 30	...
	30 - 65	...
	over 65	...

Q.34 - Marital status

(Any person without a partner will be considered to be single and any person living with a partner will be considered to be married. For the purpose of the study it is not necessary to be more specific.

Single ...
Married ...

Q.35 - Number of children

None ...
1 ...
2 ...
3 ...
4 ...
5 ...
More than 5...

Q.36 - Age of the children

(Tick more than one box if necessary)

Between 0-5 ...
" 6-15 ...
Over 15 ...

Q.37 - Household size

1 - 2 ...
3 - 4 ...
5 or more ...

Q.38 - Country of origin

New Zealand ...
Great Britain ...
Other ....

Q.39 - Education

Secondary school ...
University ...

Q.40 - Occupation of head of household .....

Q.41 - If there is another adult in the household, is he/she working?

Yes ...
No ...

Q.42 - Total income of the household

(Approximately)

	Gross income per year
Less than $5,000	...
From $5,000 to $12,000	...
More than $12,000	...

(Thank the respondent and close the interview. If the respondent cooperated a great deal ask him/her if he/she would like to help again with another interview at a later date.)

Yes ...
No ...

- -

After closing the interview:
Time interview completed .....am/pm
Time taken to complete questionnaire .....
The respondent's attitude was .....
Other comments .....
Problems if any .....

A P P E N D I X F

Instructions to the interviewers of the consumer survey

A P P E N D I X - F

INSTRUCTIONS TO THE INTERVIEWER

This survey is to measure the wine consumption and consumer preferences and habits with relation to the family's characteristics.

The interviewer should contact the person who purchases the wine for the household, and because in many cases it happens to be the head of the family, the time for the interview should be either in the evenings or weekends.

Total number of households to be interviewed by you is .....

Itinerary:

- 5 calls are to be done from each one of the starting points shown on the map.
- Make your first call at one of the starting points.
- When you leave the house make a general point of turning right.
- Skip two houses or flats and make your second call at the next house/flat.
- When you leave the house make again a general point of turning right.
- Skip three houses or flats and make your third call at the next house/flat.
- Cross the street and make your fourth call at the house in front of the last call.
- When you leave the house make a general point of turning right.
- Skip two houses and make your 5th call at the next one.
- Make sure that 5 calls are made before going to the next starting point.
- If some of the starting points are empty sections make a general point of turning right and call at the first house you find in that direction.
- If at some point you are going to cross into another district/ or you are in a cul du sac/ or there are no houses in front

of you, do not cross the street and keep turning to the right skipping two houses for your 4th call and three for your 5th call.

- Make sure your clusters do not overlap.

General Instructions:

Before starting each interview, please, fill in the call record following the instructions noted below:

NH -	No one home	Try again another time
R -	Respondent declines to be interviewed	Thank respondent and say good bye
NW -	Respondent does not decline to be interviewed but none of the members of the household purchase any wine.	Ask respondent to answer Q.2 of Section I and Section II.
NKH -	The person who purchases wine for the household is not at home	Make an appointment and come back
RC -	Respondent wishes to cooperate in interview.	Go through the whole questionnaire

Introduction:

The presentation given in the questionnaire is just an example of how to introduce oneself but each interviewer can approach the respondent in a flexible way.

In order to avoid wrong answers based on different ideas about what "wine" means, the definition of wine under the "Food and Drug regulations" is given in the questionnaire, but again the interviewer can be more flexible as long as it is made clear which types of wines are included in the present survey.

Section I:

Some questions in this section depend on previous answers and you should follow the instructions very carefully. Each question of the questionnaire has its own instructions enclosed in brackets.

Q. 1 - This is an unnecessary question if the respondent has already told you when you approached him/her initially, that they do not drink wine. In that case, ask only Q.2 of this Section and go to Section II.

Q. 2 - Should be omitted when the answer to Q.1 is affirmative.

Q. 3 - Read the alternative answers to the respondent and tick the appropriate box. Go to Q.4 if the answer is "less often than once a month". Go to Q.5 for any other of the three first alternatives.

Q. 4 - Show respondent Card 1. The cards are only to help the respondent to give accurate answers having in front of him/her the whole list of different possibilities, but you should tick the appropriate answers in the questionnaire sheet, never in the card. If "other" is answered ask the respondent to specify them and note the answer on the dotted lines.

Q. 5 - Follow the same procedure as in Q.4 but instead of ticking the boxes give them a number corresponding to the number of times answered by the respondent for each one of the circumstances. If none, note "0". If less often than once a month, tick appropriate boxes. If "others" is answered, ask the respondent to specify them and you should note the answer on the dotted line.

Q. 6 - Tick appropriate box.

Q. 7 - " " "

Q. 8 - " " "

Q. 9 - " " "

Q.10 - Show the respondent card 2. Mark only 5 types of wine among the ones listed in the questionnaire following the rank order of decreasing consumption given by the respondent. i.e. "1" for the type of wine of which the respondent drinks the largest quantity; "2" for the wine of which the respondent drinks second in terms of

the quantity consumed, and so forth .... If some of the respondents drink the same amount of wine for two or three types of wines, mark those two or three with number "1". Then if they drink less quantity of other two types of wines mark them with numbers 4 and 5 (omit 2 and 3).

Q.11 - Fill up the gap with the type of wine that has been listed as number "1" in the former question, and note all the reasons the respondents give.

Q.12 - Tick appropriate box. Go to Q.13 if the answer is "overseas". Go to Q.14 if the answer is "New Zealand". Go to Q.15 if the answer is "No preference".

Q.13 - Note the name of the country or countries the respondent gives. Go to Q.14.

Q.14 - Fill the gap with the country or countries referred to in responses to questions 12 or 13. Note the reasons given by the respondents. Go to Q.15.

Q.15 - You should write for every type of wine what the respondent's preferences are in terms of quality and the attributes of these wines as perceived by the respondents. We are interested in New Zealand wines.

i.e. a) Medium Sherry - Cooks
b) because of its flavour
" it is quite sweet, etc.

or

a) No preference
b) because I do not like fortified wines

If some of the respondents have a lot of difficulty to answer why do they prefer a particular type of wine, show them card A. However it is always better that the respondents answer by themselves without the help of the card. If you have to use the card note it in the questionnaire sheet with a rectangle.

Q.16 - Show respondent card 3 and tell him/her to answer "Yes" for each one of the points of purchase that it is not possible to get some of the wines they would like to buy. The places of purchase are listed in the card for both New Zealand wines and overseas wines. Tick appropriate boxes in the questionnaire sheet when answers are affirmative. Be careful with that question because some respond-

ents have the tendency to answer the places where they can get a particular wine, instead of the ones that it is difficult or impossible to get it.

Q.17 - Be extremely careful not to offend the respondents with your request to do the inventory while showing you the stored bottles. If the respondent objects go to Q.18. If he/she does not object, fill in the table in the questionnaire sheet with the maximum accuracy and use the code number for the column about types of wines. Omit Q.18 if you could complete the table successfully. Go to Q.19.

Q.18 - Tick appropriate boxes. Go to Q.19.

Q.19 - " " "

Q.20 - Tick appropriate box. If the answer is either "more" or "less" go to Q.21. If the answer is "the same" go to Q.22 and omit Q.21.

Q.21 - Note the amount measured in number of bottles or flagons. Go to Q.22.

Q.22 - Note response accurately. Go to Q.23.

Q.23 - You should point out that we are now interested in the total expenditure on wine.
The same for beer.
The same for spirits.

Q.24 - Tick appropriate box. If the answer is either "decreased" or "increased" go to Q.25. If it is "no change" go to Q.26.

Q.25 - Note response and go to Q.26.

Q.26 - Tick appropriate box.

Q.27 - Note response.

Q.28 - Tick appropriate box. In general people do not like to accept that sometimes advertising could influence their choice. If the respondent is inclined to talk you can ask him/her if he/she has noticed wine advertising of any kind, and if "yes", ask where. Note comments at the margin of the questionnaire sheet. If you think the respondent is either tired or in a hurry, do not ask any extra opinions and go to the next question.

Q.29 - Tick appropriate box.

Q.30 - Show respondent card 4 and tick appropriate boxes. If "something else" is answered ask the respondent to specify

and write it on the dotted line.

Section II:

The three first questions can be observed, they do not need to be asked.
Tick appropriate box for each question of this section.

Q.42 - Show the respondent card 5 and ask him/her if he/she would not mind to answer in which of the three categories A, B, or C the household can be included. If respondent refuses to give that particular information make some observations of your own estimation.

If the respondent cooperates a great deal and has a good knowledge about wine ask him/her if he/she would like to help again with another interview at a later date. Do not forget to note name and address so as to contact him/her again.

When interview is completed thank the respondent and note the time in the call record. Tick IC.

APPENDIX G

Composition of the sample

APPENDIX - G

COMPOSITION OF THE SAMPLE

	%
Sex	
Males	40
Females	60
Races	
European	98
Maori	1.5
Others	0.5
Age Groups	
18 - 30	26
30 - 65	60
Over	14
Marital Status	
Single	13
Married	87
Number of Children	
No children	41
1 child	9
2 children	20
3 children	17.5
4 children	8
5 children	1.5
more than 5	3
Household Size	
1 - 2	32
3 - 4	42
5 or more	26

	%
Nationality	
New Zealanders	85
British	8
Australians	2.5
Americans	1.5
Germans	1
Dutch	1
Indian	0.5
Austrian	0.5
Education	
Primary school	9
Secondary school	72
University	19
Occupation	
Professional	22
Production workers	19
Retired	15
Clerical	11
Administrators	9
Sales	8
Services	5
Agricultural	4
Housewives	3.5
Students	2.5
Armed forces	1
Working Partner	
Yes	33
No	67
Income Distribution	
A - Less than $5,000	27
B - From $5,000 to $12,000	57
C - More than $12,000	16

APPENDIX H

Crosstabulation tables consumer survey

Table H.1(a) - Cross Tabulation of Wine Users by Suburban Areas

	Awaruni	Brightwater	Central	Highbury	Hokowhitu	Milson	Papaeoia	Takaro	Te Ave Ave	Terrace End	West End
% of wine users within the area	52	83	78	65	75	71	58	72	96	60	68
% of wine users in respect to total	5	5	3.5	5.5	7.5	5	7	6.5	12	6	7.5

Table H.1(b) - Wine Users - Age

	18-30	30-65	over 65
% of wine users in each group	74	73	63
% of wine users in respect to total	27	61	12

Table H.1(c) - Wine Users - Nationality

	N.Z.	G.B.	Australia	Germany	India	Holland	Austria	U.S.A.
% of wine users in each group	72	75	40	100	100	100	100	67
% of wine users in respect to total	60	6	1	1	0.5	1	0.5	1

Table H.1(d) - Wine Users - Education

	Primary	Secondary	University
% of wine users in each group	41	72	92
% of wine users in respect to total	5	70.5	24.5

Table H.1(e) - Wine Users - Occupation

	Retired	Professional	Administration	Clerical	Sales	Service	Agricultural	Production	Armed forces	Housewives	Students
% of wine users in each group	69	78	76.5	68	81	60	57	69	100	40	100
% of wine users in respect to total	15	23	10	11	10	4	3	17	1.5	1.5	4

Table H.1(f) - Wine Users - Income

	Group A (less than $5,000)	Group B (From $5,000 to $12,000)	Group C (more than $12,000)
% of wine users in each group	64	70	97
% of wine users in respect to table	24	55	21

Table H.2(a) - Cross Tabulation of Non-Wine Users by Number of Children

	1	2	3	4	5	6
% of non-wine users in each group	29	18.5	33	52.5	50	14
% of non-wine users	14.5	22	34	24.5	2.5	2.5

Table H.2(b) - Non Wine Users - Household Size

	1 - 2	3 - 4	5 and more
% of non-wine users in each group	25.5	24	39
% of non-wine users	29	36.5	34.5

Table H.2(c) - Non Wine Users - Age of the Children

	Families with children		
	Younger than 5 years of age	Between 5 and 15 years of age	Older than 15 years of age
% of non wine users in each group	29.5	19	11
% of non wine users	66.5	26.5	7

Table H.3 - Cross Tabulation of Drinking Frequency by Types of Wine Most Consumed (%)

	Still White	Still Red	Rosé	Sparkling	Dry Sherry	Medium Sherry	Cream & Sweet Sherry	Port	Medium & Muscatel
Once a day	2	3	-	1.5	2	2	5.5	1	1
Once a week	12	8.5	2	5.5	1.5	3.5	3.5	1.5	-
Once a month	2	3	1.5	8	-	1.5	6	-	-
Less often than once a month	1.5	1	1.5	15.5	1.5	4	6	1.5	-

Table H.4 - Cooking Habits (%)

	Use of wine in cooking		Use of wine in Fruit Salads	
Once a week	19	(11)	16	(3)
Once a month	45	(27)	32	(6)
Less often than once a month	36	(21)	52	(9)

Figures in ( ) are the relative frequency % of the wine users

Table H.5 - Cross Tabulation of Types of Wines Consumed by Suburbs (%)

	Awa'uni	Bright-water	Central	Highbury	Hokowhitu	Milson	Papaioea	Takaro	Te Awe Awe	Terrace End	West End
Table Wines											
Still white	5.6	-	2.8	4.2	13.9	4.2	13.9	9.7	25	8.3	12.5
Still red	8.5	1.7	3.4	-	10.2	5.1	13.6	5.1	28.8	8.5	15.3
Rosé	4.7	4.7	4.7	4.7	11.6	2.3	18.6	9.3	16.3	4.7	18.6
Sparkling	7.7	9.9	6.6	8.8	6.6	7.7	7.7	11.0	13.2	9.9	11.0
Dessert Wines											
Dry Sherry	6.1	-	-	3.0	9.1	3.0	12.1	9.1	36.4	-	21.2
Medium Sherry	3.8	3.8	9.4	5.7	9.4	13.2	17.0	5.7	13.2	9.4	9.4
Cream & sweet Sherry	7.1	10.0	5.7	7.1	12.9	7.1	11.4	10.0	7.1	8.6	12.9
Port	-	7.1	7.1	7.1	14.3	7.1	14.3	-	7.1	21.4	14.3
Medium & Muscatel	10.0	10.0	10.0	10.0	10.0	20.0	10.0	20.0	-	-	-

Table H.6 - Cross Tabulation of Types of Wines Consumed by Age (%)

	18 - 30	30 - 65	Over
Still white table wine	29	67	4
Still red table wine	25	69	5
Rosé	23	74	3
Sparkling	32	62	6
Dry Sherry	24	69	7
Medium Sherry	23	63	14
Cream & sweet Sherry	21	63	16
Port	14	79	7
Madeira & Muscatel	11	78	11

Table H.7 - Cross Tabulation of Types of Wine Consumed by Occupations

	Retired	Professional	Administration	Clerical	Sales	Service	Agricultural	Production	Armed Forces	Housewives	Students
Table wines											
Still white wine	7.2	39.1	15.9	7.2	5.8	4.3	2.9	11.6	1.4	-	4.3
Still red wine	10.9	45.5	10.9	5.5	5.5	3.6	3.6	7.3	-	1.8	5.5
Rosé wine	5.1	41	15.4	5.1	5.1	2.6	2.6	15.4	2.6	-	5.1
Sparkling wine	9	19.1	12.4	12.4	10.1	3.4	3.4	23.6	2.2	2.2	-
Dessert wines											
Dry Sherry	6.9	58.6	17.2	6.9	-	-	3.4	3.4	3.4	-	-
Medium Sherry	12	26	10	10	16	4	2	10	-	2	8
Cream & sweet Sherry	18.8	12.5	9.4	14.1	10.9	3.1	4.7	20.3	1.6	3.1	1.6
Port	14.3	14.3	14.3	14.3	-	-	-	28.6	-	7.1	7.1
Madeira & Muscatel	11.1	33.3	11.1	11.1	-	-	-	33.3	-	-	-

Table H.8 - Brands Consumed in Restaurants

	Still White Table Wine	Still Red Table Wine	Rosé	Sparkling
Imported	38.1%	6.3%	60%	27.9%
Corbans	19	6.3		20.9
Cooks		6.3		
Glenvale	4.8			
McWilliams	4.8	31.3		11.6
Montana	9.5	12.5	10	9.3
Selaks		6.3		
Waiherere	4.8			
Don't remember	19	31.3	30	30.2

Table H.9(a) - Number of Bottles at Home by Area (%)

	Awapuni	Brightwater	Central	Highbury	Hokowhitu	Milson	Papaeoia	Takaro	Te Awe Awe	Terrace End	West End
No. of bottles											
Less than 5	50	100	100	100	69	100	73	67	22	80	38.5
Five to nine	18	-	-	-	15	-	18	33	22	20	-
Ten to fourteen	33	-	-	-	8	-	-	-	11	-	-
Fifteen to twenty	-	-	-	-	8	-	-	-	17	-	15.5
More than twenty	-	-	-	-	-	-	9	-	28	-	46
	100	100	100	100	100	100	100	100	100	100	100

Table H.9(b) - Number of Flagons by Area

Less than 5	100	100	100	100	100	100	86	100	100	100	90
Five to nine	-	-	-	-	-	-	14	-	-	-	-
Ten to fourteen	-	-	-	-	-	-	-	-	-	-	10
	100	100	100	100	100	100	100	100	100	100	100

Table H.9(c) - Number of Bottles - Age (%)

	18-30	30-65	over 65
Less than 5	70	56	90
5 - 9	17.5	15.5	
10 - 14	4	5	
15 - 20		8	10
more than 20	8.5	15.5	
	100	100	100

Table H.9(d) - Number of Bottles - Education (%)

	Primary	Secondary	University
Less than 5	67	79.5	25
5 - 9	-	13	14
10 - 14	33	-	14
15 - 20	-	4.5	11
More than 20	-	3	36
	100	100	100

Table H.9(e) - Number of Bottles - Occupation

	Retired	Professional	Administration	Clerical	Sales	Service	Agricultural	Production	Armed Forces	Housevives	Students
Less than 5	67	21.5	54.5	100	91	67	50	77	100	100	100
5 - 9	-	28.5	9	-	9	33	-	23	-	-	-
10 - 14	8	11	-	-	-	-	50	-	-	-	-
14 - 20	8	14	9	-	-	-	-	-	-	-	-
More than 20	17	25	27.5	-	-	-	-	-	-	-	-
	100	100	100	100	100	100	100	100	100	100	100

Table H.9(f) - Number of Bottles - Income Group (%)

	Group A	Group B	Group C
Less than 5	38.5	77.5	20
From 5 to 9	11.5	13	16
From 10 to 14		3.5	12
More than 20		6	32
	100	100	100

Table H.9(g) - Number of Bottles at Home - Number of Children (%)

	1	2	3	4	5	6
Less than 5	44	70.5	50	55.5	-	67
5 - 9	22	15	10.5	22	-	-
10 - 14	11	4	10.5	-	-	-
15 - 20	-	-	10.5	11	100	33
More than 20	22	11	10.5	11	-	-
	100	100	100	100	100	100

APPENDIX I

Performance of KYST

APPENDIX - I

What Kyst Does

(by J. Serrallach)

The need to write a brief comment about the performance of the programme arises because the manual does not fully describe one of the most important functions that Kyst can do. Due to the lack of information some former users of the programme could not take full advantage of Kyst possibilities and had to incur considerable difficulties to pre-arrange the data for the programme when this was not really needed. The important function referred to above is to be able to aggregate the data of different subjects in a kind of average space configuration. The procedure for obtaining the points of the coordinates in other similar programmes (i.e. M-D-SCAL-V) is the numerical method of steepest descent. The method involves improving the starting configuration in the direction of the minimum stress value. When a new set of points is introduced from another subject the procedure is repeated until a minimum value of stress is achieved. Since Kyst is meant to be an improved version of M-D-SCAL-V and TORSCA 9 including the best features of both, and has an easier way to transform the data prior to scaling, it did not seem unreasonable to think that Kyst could also aggregate the data.

How to make the programme aggregate the data

Section 2 of the manual gives an example of the input deck arrangement and a description of the cards. Card no. 9 is a "parameter card" where the first parameter indicates the number of rows and columns (if it is a square matrix), the second parameter is the number of values provided for each matrix entry and the third parameter is the number of matrices included in the data deck. The output would not be a space configuration for every subject but an aggregate configuration of all subjects.

The programme can cope too with missing data.

APPENDIX J

Running of PREFMAP-2

A P P E N D I X - J

How to run PREFMAP-2 at Massey

(Programme that relates preference data to multidimensional scaling solution)

(by J. Serrallach)

I - Introduction

PREFMAP-2 is a revised version of PREFMAP (Code file MAPREF at Massey). The main improvement of PREFMAP-2 is that the stimulus space can be obtained externally, as in MAPREF, as well as generated internally from the preference data itself. Other improvements lie in the procedures for rotation and/or weighting of coordinates of the stimulus space (called sometimes canonical rotation and canonical weighting).

PREFMAP-2 consists of 4 phases corresponding to 4 models: -

Phase 1 - Idiosyncratic rotation and differential axis weighting

Phase 2 - Idiosyncratic differential axis weighting in rotated space of average subject

Phase 3 - Ideal point model with equal axis weighting in rotated and stretched space of average subject

Phase 4 - Vector model in rotated and stretched space of average subject.

II - Inputs and limits

The input data is in the form of subjects-by-stimuli matrix. Each row of the matrix represents a subject and the entries in the row are the preference judgements made by each subject. The columns represent the stimuli or objects.

Preference matrix

	1	2	3	4	5	.....	N Stimuli
	2						
	3						
	4						
	5						
	⋮						
Subjects	M						

The maximum number of subjects is up to 30 in PREFMAP 2 and the maximum number of stimuli is also 30.

If the externally generated stimulus space is used, coordinates of N stimuli in K dimensions must be provided by the user ($K \leq 5$).

III - Output

The instruction manual from BELL Laboratories states that the programme gives a printed output and a plotted output. The programme run at Massey gives a printed output for each subject within each one of the 4 phases of the programme, but it does not give any of the four kinds of plots specified in the manual. No plotted output can be expected by the user.

The printed output in its 4 phases is correctly specified in the manual.

As a matter of interest, as Green and Rao have stated (1), "relatively little appears to be gained by going beyond the simple (equal-axis weighting) ideal-point model in the rotated and differentially stretched space of the average subject".

It seems therefore reasonable to suppose that most subject's preference data can be fitted reasonably well by either the simple ideal-point (Phase 3) or vector model (Phase 4) with no need for idiosyncratic axis rotation (Phase 1) or differential stretching of the average subject (Phase 2).

(1) "Applied Multidimensional Scaling", External Analysis of Preference Data, page 113.

IV - Input deck arrangement

The user has to be aware of the differences in deck arrangement between PREFMAP 2 and MAPREF in spite of the instructions of the manual (page 8) that say "the input deck arrangement of PREFMAP 2 is the same as MAPREF". In fact this is not so since the order of the cards is different and the order of the parameters in Card 1 is different too. In MAPREF the given stimulus in K dimensions have to be introduced before the Preference Matrix, while in PREFMAP 2 the scale values should be located in the deck arrangement before the external stimuli configuration.

When a non-metric analysis is wanted, LFITSW (parameter no. 10 in card 1) has to be greater than 0, and an extra card should be introduced after the data deck (card 6). In the manual (page 10) it says: ('Use Format (F7.20'). It should say: "Use Format (F7.2)". The programme will not work if you introduce the format card. You should introduce only a card based on this format for stopping iterative procedure on monotone fit. This card should be as follows: 0.01 , starting at column 4. Do not follow the example shown in the manual where the card is 0. , starting at the first column and situated in the wrong place in the deck.

V - Example

Example of data deck arrangement in matrix procedure:
(10 subjects, 10 stimuli, 2 dimensions)

```
$ JOB.....          )
USER.....           )     WORK FLOW statements
CLASS 1;BEGIN ;     )
$ RUN BELL/CODE/PREFMAP2
DATA
  10  2  10  0  1  0  3  4  0  0  0  0  0  0  1  1  0  0  0  4
```

TITLE CARD

(3X,10F4.0)	)	
....	)	Scale values
....	)	
....	)	
(3X,2F7.3)		
....	)	Matrix of N Stimuli in K dimensions
....	)	

(The matrix data must be punched as indicated by IRX.)

Blank card

$ END JOB

For a non-metric solution the arrangement is the same, only LFITSW (the 10th parameter in card 1) has to be 1, or 2, or 3, and the following card has to be inserted after the data matrix and before the blank card:

0.01

VI - Options

The option of microfilm plotting is not available at Massey.

APPENDIX K

Popular New Zealand and imported wines

A P P E N D I X - K

New Zealand Wines

Type	Brand	Name
Still White Wines:	McWilliams	Cresta Dore
	Corbans	Liebestraum
	"	Sauterne
	Montana	Hock
	Cooks	Chasselas
	"	Pinot Gris
	Mission	Hock
Still Red Wines:	McWilliams	Bakano
	Corbans	Burgundy
	"	Riverlea
	Montana	Pinotage
	Cooks	Alicante
Rosé Wines	McWilliams	Spritzig
	Corbans	Vin Rosé
	Penfolds	Rose
Sparkling	Corbans	Premiere Cuvée (Medium)
	"	Liebestraum
	McWilliams	Marque Vue
	Cooks	Creanza
	Montana	Cold Duck
	Cooks	Chasseur

Overseas Wines

Name	Type	Country
Gancia Asti Spumanti	Sparkling	Italy
Blue Nun	Still white	Germany
Sangre de Toro (Torres)	Dry red	Spain
Mateus Rosé	Rosé	Portugal

Comment: Several wines from Australia and South Africa were mentioned by the respondents but there was no agreement among them.

APPENDIX L

List of quality wines

A P P E N D I X - L

White Wine

Pinot Chardonnay	- Montana - Corbans - McWilliams
Gewurztraminer	- Collard Brothers - Vidal
White Riesling	- " "
Sauvignon Blanc	- Spence Brothers
Pinot Gris	- Cooks

Red Wine

Refosco	- new Italian variety
Cabernet Sauvignon	- Vidals and others
Pinotage	- Montana and others
Pinot Noir	- Mission - Nobilo - Villa M - Peter's Wines (Henderson) - Corbans - Vidals

APPENDIX M

Instructions for Multidimensional Scaling Interviewers

A P P E N D I X - M

Instructions - Questionnaire

Introduction

First show the respondent the cards with the names of wines used in the research exercise so that he/she may become familiar with them.

Part A - Direct Study of Similarities

Show the respondent Card B and explain to him/her how to use the 7 point scale which indicates degrees of intensity, which range from "Extremely Similar" to "Extremely Different", in the pair by pair comparisons of wines that will follow. By "similar" we mean that a particular wine can be substituted for another which for some reason might be unavailable. However the criteria of "general similarity" is up to the respondent. It is advisable to try to mantain the same criteria of similarity throughout all comparisons. Finally, show the respondent the 45 possible pairs, each one in turn, and ask him/her to rate each pair from "Extremely Similar" to "Extremely Different" on the seven point degrees of intensity scale.

Part B - Judgements

Next, the respondent has to judge the same 10 items on each of the following bipolar scales:

1. White/Red
2. Still/Sparkling
3. Sweet/Dry
4. Light/Body
5. Distinctive nice flavour and/or taste / Unpleasant flavour and/or taste
6. Good quality wine / Bad quality wine
7. Cheap/Expensive
8. Appropriate to drink with food / Appropriate to drink on its own

9. Convenient package or nice container / Inconvenient size or shape of container
10. Easily available / Difficult to obtain

In each case we shall present one of the bipolar scales and ask the respondent to rate each of the 10 items on a 7 point intensity scale.

Part C - Preferences

To get some idea of respondent's personal preferences for each of the items in different situations, we ask him/her to rank the 10 items from most preferred to least preferred in the following:

a) overall preferences
b) social celebrations, parties, etc
c) at home having dinner with guests
d) at the restaurant

Part D - Price-Quantity

Ask the respondent how many bottles of wine he/she drinks per week on average.

Ask him/her to indicate how many bottles of wine he/she would consume if the prices for wine were those shown on Card D.

Respondent reaction to the questionnaire

Time taken to complete the questionnaire .....
Comments: .....

APPENDIX N

Parameters of PREFMAP

A P P E N D I X - N

A Summary of Programme Parameters

	Parameters	Fields (Cols. on Card 1)	Index (page)	Description of Parameter	Default Value
	Data				
1	N	1- 4	6	Number of points	
2	K	5- 8	6	Number of dimensions	
3	NSUB	9-12	7	Number of subjects	
4	ISV	13-16	7	Determines if small scale values are more preferred (0), or less preferred (1)	0
5	NORS	17-20	7	Normalization of data--yes (1), no (0)	0
6	IRX	21-24	7	How the stimulus space is punched-- if N by K (0) or K by N (1)	
	Phase				
7	IPS	25-28	10	Starting phase	1
8	IPE	29-32	10	Ending phase	4
9	IRWT	33-36	11	For starting phase = 3--if read in weights (1), if not (0)	0
	Nonmetric				
10	LFITSW	37-40	11	Determines whether to do metric (0) or non-metric (>0) analysis	0
11	IAV	41-44	12	How to define the average subject's scale values; if remains the same (0), if not (1)	0
12	MAXIT	45-48	12	Number of nonmetric iterations	15
13	ISHAT	49-52	12	Determines which set of scale values is used; if use the original (0), if not (1)	0

	Plot				
14	**IPLOT**	53-56	13	Determines what kinds of plot to get; if plot of average subject only (0), if more plots (>0)	0
15	**MDV**	57-60	14	Determines whether to draw axes for each ideal point; if yes (1), if no (0)	0
16	**MLIP**	61-64	14	How to label ideal point; if numbers (0), letters (1)	0
17	**MIDEN**	65-68	14	Determines whether to read in symbols for labelling the stimuli on plots; if yes (1), no (0)	0
	PREFMAP2 only Optimization				
18	**MOPT2**	69-72	14	For starting phase = 2, determines whether to apply optimization (1), or not (0)	0
19	**MOPT3**	73-76	15	For starting phase = 3, determines whether to apply optimization (>0), or not (0)	0
	Stimulus Space				
20	**IST**	77-80	15	Determines ways to obtain the stimulus space. If double centre the data matrix and generate the stimulus space internally (0). If other options(>0)	0

APPENDIX O

KYST control cards

APPENDIX O

KYST Control Cards

Card 1 indicates that the initial configuration is to be generated using the TORSCA procedure.

Cards 2 and 3 show that the data is in the form of an upper half matrix with the diagonal absent.

Card 4 states that a maximum of 3 pre-iterations are to be used in this procedure.

Card 5 indicates that scaling is to be done in 3, 2 and 1 dimensions, that is, separate computations will be performed successively, (3 was the "maximum dimension" and 1 the "minimum dimension").

Card 6 specifies that the final configuration for each dimensionality should be rotated to principal components.

Card 7 states that no more than 50 iterations should be performed in any single scaling solution even if the stress has not yet reached its minimum value.

Card 8 indicates that the regression of distances on data values is monotone ascending (the low values are equivalent to similarities and high values to differences).

Card 9 is a title card.

Card 10 indicates the number of rows (and columns) of each matrix (namely 10), the number of values provided for each matrix entry (namely 1), and finally, the number of matrices included in the data deck to be aggregated in the average final configuration (namely 20).

Card 11 is a format card, and describes the format of the input data matrix.

Card 13 is the control card that causes the computation to start.

Card 14 is the control card that causes computation to stop.

The 3rd number on card 10 has to be varied depending on the number of matrices in the data deck. In the cases of the 10 matrices (10 number of subjects with complete or missing values) card No. 10 had the following format:

10 1 10

A particular characteristic of the arrangement of the control cards is the freedom of re-arrangability, except for the COMPUTE card that has to be the last card of the data deck, and just before the stop card.

KYST Control Cards for Scaling Solutions in 3 through to 1 dimension

WORK FLOW STATEMENT - RUN BELL / CODE / KYST:

Input deck arrangement

Card No.		Card description
1		TORSCA
2		UPPERHALFMATRIX
3		DIAGONAL=ABSENT
4		PRE-ITERATIONS=3
5		DIMMAX=3, DIMMIN=1
6		COORDINATES=ROTATE
7		ITERATIONS=50
8		DATA, REGRESSION=ASCENDING
9		DIRECT SIMILARITIES
10		10 1 20
11		(5X,9F3.0)
12	.....	
	.....	
	Data matrix	each row of the data matrix must begin on a new card.
	.....	
	.....	
13		COMPUTE
14		STOP

APPENDIX P

Input data for PREMAP2

APPENDIX P

Input data for PREMAP2

```
Card 1  - 5 RUN BELL/CODE/PREFMAP2
Card 2  - DATA
Card 3 -   10  2  20  0  0  0  4  4  0  0  0  0  0  0  1  0  0  0  4
Card 4  - TITLE CARD
Card 5  - (3X,10F4.0)
Card 6  - - - - - - - - -
          - - - - - - - - -   Scale values forming a 10 by 20 matrix
          - - - - - - - - -   for one bipolar scale at a time
Card 7  - (3X.2F7.3)
Card 8  - - - - - - - - -
          - - - - - - - - -   Matrix of N stimuli in K dimensions
          - - - - - - - - -
Card 9  - Blank card
Card 10 - 8 END JOB
```

Cards 1 and 2 are control cards.

Card 3 is a parameter card. It contains 20 parameters named: N, K, NSUB, ISV, NORS, IRX, IPS, IPE, IRWT, LFITSW, JAW, MAXIT, ISHAT, IPLOT, MDV, MLIP, MIDEN, MOPT2, MOPT3, and KIST which are described in Appendix N.

Card 4 is a title card.

Card 5 is a format card that indicates the format in which the scale values are punched (use floating point format).

Card 6 is a matrix of subject by stimulus. Each row represents a subject.

Card 7 is a format card, only necessary if IST = 4 which means the optior of using externally generated stimulus space.

Card 8 is the matrix of N stimuli in k dimensions and again is onl present if the option of external stimulus space is used. The matrix dat should be punched as indicated by IRX.

Card 9 is a blank card and must be the last card of the data input jus before the END JOB workflow statement.

For a three dimensional configuration parameter K in Card no. 3 has to l 3, and Format card no.7 has to be (3X,3F7.3), because the followi matrix of N stimuli is in 3 dimensions. The rest of the input data de is the same as that for two dimensions.

APPENDIX Q

Computer Input for the Unfolding Analysis of Similarity Data

APPENDIX Q

Computer Input for the Unfolding Analysis of Similarity Data

```
TORSCA
PRE-ITERATIONS=3
COORDINATES=ROTATE
SFORM2
SPLIT=BYROWS
REGRESSION-ASCENDING
CARDS
ITERATIONS=50
DATA,UPPERCORNERMATRIX
DIRECT SIMILARITIES
 20  45    1      1
(3X,45F1.0)
------------------
------------------  Rectangular matrix of 20 by 45
------------------
COMPUTE
STOP
```