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ALCOHOL USE IN IRELAND:

SOME ECONOMIC AND SOCIAL IMPLICATIONS

Denis Conniffe and Daniel McCoy

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GENERAL SUMMARY

Alcohol plays an important role in the economic and social life of Ireland. The control of alcohol consumption, for the purpose of curtailing its abuse, has long been an objective of public policy. Recent international efforts, particularly those by the World Health Organisation, have again refocused attention on achieving reductions in national alcohol consumption levels. A target of a 25 per cent reduction in per capita consumption from 1980 levels has been advanced. The Irish Department of Health, partially in response to the international initiatives, is developing a national policy on alcohol use. The formulation of public policy on alcohol needs to take account of economic, social, medical, cultural and political factors. Some of the economic and social issues are addressed in this paper in the context of the contemporary international developments.

The alcohol industry traditionally has had an important influence within the Irish economy, since the production and distribution of alcohol affects general economic activity in various ways. Total employment in the alcohol manufacturing sector was static, at about 8,300, from the mid-1970s to early 1980s, but since then the numbers have steadily declined to about 4,600 in 1991. This employment amounts to over 2 per cent of total industrial employment and nearly half a per cent of the total at work. However, in addition to manufacturing jobs, there is additional employment in providing inputs to the brewing and distilling industries and in the retailing of alcohol drinks. Since there are over 10,500 fully licensed premises and 300 off-licences in Ireland, this linkage employment, although difficult to estimate, is much larger than that in manufacturing. A total of about 33,000 full-time, or 48,000 including part-time, jobs are attributable to the whole alcohol industry and drinks trade. This accounts for about 3 per cent of total jobs in the economy, so the alcohol industry makes a considerable contribution towards employment. However, a reduction in per capita alcohol consumption need not necessarily mean job losses. If the reduction was achieved by diverting a proportion of drinking to lower alcohol drinks, there might not even be reduced employment in the production sector. A reduction in consumption with an unchanged composition of drinking would mean some job losses in production, but perhaps not in retailing if, for example, people substituted food for alcohol in public houses.

The Irish Exchequer benefits substantially from receipts obtained from alcohol consumption. There are excise taxes and VAT on drinks and there are also the licence fees and rates paid by publicans. Excise duty on alcohol is still a substantial source of revenue, although in real terms it has declined somewhat since the early 1980s. It amounted to over IR£440 million in 1991, or over 4 per cent of total current Government receipts. However, the loss of revenue, if any, associated with a reduction in consumption obviously depends on the mechanisms used to achieve the reduction. For example, higher excise taxes would increase revenue from the

remaining consumption. But, in any event, the role of alcohol taxes in overall receipts faces change. The Single European Market requires substantial alignment in excise systems and movements towards greater equality of duty rates as prerequisites for the completion of the internal market. This need not mean that Ireland will no longer be able to unilaterally vary excise rates, but without border controls Irish taxes on alcohol could not be maintained at far higher levels than the minimum ones in force in the Community.

An additional positive role of alcohol for the economy could be said to be the contribution the industry has made towards relaxing the national balance of payments constraint, which has acted as a check on the capacity of the Irish economy to generate employment and higher living standards. This arises from alcohol exports having exceeded imports over the years, with the value of alcohol exports being nearly three times that of imports in 1991. But reductions in domestic consumption need not directly affect exports, while if the international emphasis on achieving lower alcohol consumption affected export demand, the ratio of exports to imports would decline, unless there was domestic reduction.

People do not have to drink alcohol; they choose to do so in preference to spending their money otherwise and this must imply that they perceive themselves deriving benefits from alcohol consumption or associated activities. Indeed, in strict economic theory, these are the true benefits from alcohol consumption and the contributions to employment, etc., are just consequences of how consumers choose their spending patterns. If they choose differently, other manufacturing and retail sectors might produce the jobs and revenue. Such a view makes strong assumptions about the efficiency of operation of an economy. It is doubtful in the Irish case that the issue of employment can be left out of the reckoning.

The argument against reducing the welfare that consumers perceive they derive from alcohol consumption can be countered on either of two grounds. First, they may not really be maximising their welfare, even if purchasing their preferred bundle of goods, perhaps because of ignorance of the long-term consequences of drinking, or because of addictive effects. Second, their choices may affect other people's welfare and restricting choice may be justified for that reason.

Overall alcohol consumption per adult in Ireland increased by 83 per cent between 1960 and 1991. Consumption of beer rose steadily though the 1960s and early 1970s and then stabilised. Consumption of spirits rose to a peak at the end of the 1970s, an increase of 187 per cent over 1960, before falling in the early 1980s. The fall may well be exaggerated, because of smuggling or cross-border purchases, so that spirit consumption may have been understated substantially. In any event, consumption seems to have stabilised in recent years, showing 100 per cent increase over the 1960 levels. Consumption of wine and cider have shown the greatest percentage increases of all, although both from low initial bases.

Alcohol consumption per adult, in litres of pure alcohol, peaked in Ireland at the end of the 1970s at 9.9 litres. Having declined in the mid-1980s it has again risen to over 8.8 litres by 1991, 67 per cent of this is accounted for by beer, 27 per cent by spirits and the remainder by wine consumption. In terms of expenditure on

alcohol, rather than consumption, personal expenditure on alcohol in 1991 was about IR£1.76 billion. When an estimate is made for the amount of business expenditure on alcohol the total expenditure for Ireland is closer to IR£2 billion.

Having said all this, it should not be assumed that Ireland has especially high alcohol consumption in the international context. By European standards, Irish alcohol consumption on a per capita basis is among the lowest in Europe, being less than half of that of France or Spain. It is true that in terms of expenditure the Irish figures would seem relatively high. However, international comparisons of expenditures between countries are complicated by the fact that the official statisticians in the various countries do not have a uniform method of treating alcohol expenditure in national accounts. In Ireland, spending on alcohol is attributed totally to "alcohol" in the national accounts. In most European countries only off-licence type sales are attributed to alcohol, while money spent on drink in bars or restaurants is attributed to such categories as recreation, restaurants or entertainment. These different accounting conventions can have huge effects on apparent alcohol expenditures, so that naive extractions from tables of national accounts can be very misleading. When accounts are compiled differently between countries it is not possible to deduce precisely correct comparisons. Ireland's low level of volume intake will be somewhat counterbalanced by high excise taxes, but hardly sufficiently to make the expenditure comparable to other European values, let alone to make it four times that of France as the United Nations (1989) comparisons seem to do.

Factors influencing consumption include the obvious ones of income and price. The impacts on consumption can be summarised in terms of income and price elasticities. The income elasticity is the percentage increase in consumption per adult given a 1 per cent rise in income. The income elasticities for beer, spirits and total alcohol are relatively similar and greater than unity, indicating that increasing economic growth in Ireland will increase alcohol consumption more than proportionately if historic trends and tastes continue to operate. The income elasticity for wine is very high and probably reflects a relatively recent upsurge in popularity among the higher income groups.

The price elasticity is the percentage decrease in consumption given a 1 per cent rise in price. Individual components of alcohol have their own price elasticities and also cross-elasticities on the prices of the components. For example, if the price of spirits rose by 1 per cent, consumption of beer might be expected to rise (assuming its price has remained the same) by an amount given by the cross-price elasticity. The price elasticity for total alcohol is -0.4, an inelastic value showing that overall consumption of alcohol is not very sensitive to price. But the own-price elasticities of spirits and wine are close to unity, indicating that they are more sensitive to price changes. If spirits price rises, another drink will be substituted unless its price has also risen. If the price of either spirits or wine rises, beer is substituted. But if all prices are raised simultaneously the scope for substitution cancels out and the overall drop in consumption is a lot less than individual responses might suggest.

Pricing policies can encourage switching to forms of drinks with lower concentrations of alcohol. In this regard the pricing strategies of breweries and retailers in relation to low alcohol beers may deserve attention since in pubs these drinks are practically as expensive as stronger beers. Greater competition, through more licensed premises, may be desirable, at least in some areas. Another problem is that the scope for using pricing as a mechanism to deter, or redirect, drinking may be inhibited by EC developments. Given the harmonisation of excise rates, in the long-run Irish alcohol prices will have to move towards the European average. If prices are to remain a potent mechanism to deter drinking, then co-ordinated efforts to increase alcohol taxes in other Community countries may be necessary, if Irish prices are not to fall more than moderately.

Other factors that may have influence on alcohol consumption patterns include the demographic structure of the population and the characteristics of the households comprising it. Demographic factors are important because total alcohol consumption, or alcohol per head of population, clearly depends on the population distribution between children and adults as well as the changing proportions of non-drinkers among adults. Average consumption per adult understates the quantities actually consumed by alcohol drinking adults since non-alcohol consumers are included in the total. Reliable information on proportions of non-drinkers in the population is difficult to obtain and survey estimates can have high error variances. It has been reported that about 20 per cent of Irish adults have never drunk alcohol but that the number of abstainers among young adults has fallen to about 12 per cent. If the cohorts of young people remain in Ireland, the proportion of non-drinkers in the population will fall as the cohorts age.

Emigration slows down behavioural trends, or patterns associated with the younger portions of the adult population. Irish migrants abroad will probably have adapted their behaviour, to some extent at least, to the patterns of their host countries. If they decide to return to Ireland, they would then accelerate the adjustment towards European patterns. This would move Irish alcohol consumption towards European levels.

Some of the effect on drinking patterns of household characteristics can be examined using the CSO's Household Budget Survey by grouping households according to these characteristics. Commencing with household location, rural households were found to spend less on alcohol than urban ones. While this is only to be expected since average rural incomes are lower than urban ones, the magnitude of the difference is greater than a common income elasticity would suggest and indeed elasticities were significantly lower in rural areas for spirits and for wine, though not for beer. A second measure of location is by geographical region and analyses were conducted in terms of the eight planning regions. The East region comprising Dublin, Kildare, Meath and Wicklow had the highest alcohol expenditure and the highest income. Again, the alcohol consumption in the East was higher than the income differential would explain, because a higher income elasticity existed.

Analysis by household composition, as defined by the number of adults and children in a household, demonstrates that both incomes and alcohol expenditures differ greatly between groups. Households of different composition could have unequal expenditures on alcohol even if they had equal incomes. Expenditure would be highest for the "single adult under 65 household" and lower for households with children. This is clearly plausible since children imply committed expenditures and reduce discretionary income, so that a couple with children with an equal income to a single adult, actually have much less allocatable income. There is also a very large difference between single adults aged under and over 65, quite beyond what is explicable by the income difference. However, this includes a gender effect as well as an age effect, because of the longer female life span.

Categorisation of households by social group based on the profession of head of household (professional, salaried employees, non-manual workers, skilled manual, unskilled manual, farmers and agricultural workers) show variations in alcohol expenditure by group and by income, although they are not all uniform. Expenditure on alcohol is highest for Social Group 1, since it has the highest average income. Actually, beer consumption is lower for this group than for groups 3, 4 and 5, but spirits and wine consumption are higher. It is only for Social Group 1 that expenditure on wine matches that of spirits. However, if incomes could be equalised in all groups, Social Group 1 would actually spend less on alcohol than the others, which would spend 18, 31, 43, 79 and 13 per cent more on alcohol respectively. Thus unskilled manual workers would have the highest spending on alcohol. However, deductions need to be constrained by consideration of the degree to which social groups are a consequence of income differences, rather than the result of an independent categorisation. It should also be said that it is known that understatement of alcohol expenditures occurs in the Household Budget Survey.

Although the majority of people who consume alcohol seem to do so in moderation and experience few adverse effects, there can be negative consequences both for the individual and society. High levels of alcohol misuse lead to the physical and medical consequences of increased morbidity and mortality rates for such alcohol related illnesses as alcoholism, alcohol psychosis and cirrhosis of the liver. Deaths and physical disabilities can also result from accidents in which alcohol is implicated. There are also psychological consequences from acute alcoholism resulting in serious mental illness and, more pervasively, there are the social consequences, as alcohol has a very substantial role in many social disruptions. The problems created by alcohol impose costs on individuals, their families and on society in general.

Besides the costs associated with the direct medical consequences, there are the costs arising from work-place production losses due to absenteeism and illness, as well as to accidents attributable to alcohol. Costs are incurred in treating people with alcohol related problems and even some expenditure on social welfare transfer payments paid out to drinkers, or their dependents, might not have occurred without alcohol abuse. Some of the expenditure on police and social work is also incurred in dealing with problems associated with alcohol abuse.

However, quantifying these costs is a very difficult matter and many issues are unresolved. Even when it is certain that heavy alcohol consumption does lead to a deleterious medical consequence, the details of the dose-response relationship may be quite unclear. Does consumption have to exceed a high threshold to be damaging, or does this risk always rise with consumption? There have even been claims that moderate drinking reduces the risk of certain conditions. However deficient the information is on medical consequences of heavy drinking, it is far worse on such aspects as the misery caused to families of alcohol abusers and quantification of costs is sometimes impossible.

So it is not surprising that attempts at measuring costs of alcohol misuse, and balancing them against the benefits of consumption, take a much more confined approach: that is, one that concentrates on the impact of alcohol use for the Exchequer. Even then, data are sparse and conclusions tentative. Studies for Ireland seem to indicate that drinkers pay more in taxation on alcohol than the total of costs their drinking imposes on the State. However, the studies looked at all drinking, not at the top 25 per cent of consumption. Depending on which drinkers do the reducing and how they are motivated, the cost saving could exceed the revenue forgone.

This raises the question of who are the problem drinkers and what group of drinkers impose costs upon the State. Views on problem drinkers, or alcoholics, have varied over the century. The blame was once focused squarely on the problem drinker himself; later, a disease concept of alcoholism developed. In the 1950s the Ledermann hypothesis challenged the previously held view that alcoholics are a separate group from the whole population. The hypothesis suggests that there is a constant relationship between per capita alcohol consumption and the prevalence of heavy drinkers; so if average consumption can be lowered then this will also decrease the consumption levels of heavy drinkers and the number of alcoholics.

If the Ledermann hypothesis could be taken as true, it becomes quite plausible to suppose that a 25 per cent decrease in consumption could save the State more than would be forgone in revenue. Costs would be more than proportionally reduced, if it is at all true that the probability of undesirable effects increases with the volume of consumption, while revenue would be at most proportionally reduced. Revenue might not be reduced at all, if the mechanism producing the reduction was a tax increase, although in the context of the Single Market the scope for such an increase must be limited. Revenue would be reduced, but less than proportionately, if the reduction was achieved by switching drinking to lower alcohol drinks.

The figure of 25 per cent originates from a target set by international health organisations. It could be argued that a more significant figure could be deduced from a comparison of Irish chemical alcohol consumption, which is among the lowest in the EC, with the medically recommended "safe" drinking limits. Adjusting Irish average consumption for abstinence, and conforming with gender adjusted limits, then suggests, in the spirit of the Ledermann hypothesis, a reduction of about 8 per cent in consumption.

However, the Ledermann hypothesis has been frequently challenged and may not be as general in its applicability as some of its supporters believed. Perhaps the proportion of heavy drinkers, or the prevalence of alcohol related problems, will not automatically adjust following changes in average consumption. Epidemiology, which is the study of patterns of disease and health in populations, began to come to the fore in explaining the causal factors behind alcohol abuse over the last two decades. Given the growing evidence of a wide range of drink related problems distributed throughout the general population, it also challenges the notion of alcoholism as a disease. However, it supposes that many factors influence drinking patterns and the probability of an individual developing alcohol related problems. These factors include: age, gender, occupation, race, nationality, culture, religion, income and alcohol availability.

There is a growing consensus internationally that alcohol control policies should be epidemiologically based, controlling the problem of alcohol abuse through a mixture of legislation, market based behavioural incentives and education. As regards legislation, controls on distribution are used in almost every country, and there is evidence that factors such as the minimum age are important. So, of course, is legislation in respect of drink driving. Prices and taxation measures can influence the effective demand for alcohol, and perhaps more importantly, can influence the choice of drink through pricing policy, but this has been discussed earlier. Information and education campaigns can be very effective in encouraging a shift in attitudes and behaviour if targeted at particular groups, rather than at the general public. The evidence on the impact of restrictions on advertising for alcohol consumption is very varied. There is a view that advertising does not influence the overall quantities of alcohol consumed, but rather influences the share of the market among the various drinks. If this is correct then advertising, along with pricing, could be a very useful tool in moving consumers towards alternative, or low-alcohol, drinks.

Chapter 1

INTRODUCTION AND BACKGROUND

1.1: *Introduction*

The consumption of alcohol has been a feature of nearly every society and civilisation in history. There has been a long tradition of concern about the abuse of alcohol and the need for its control in society. This tradition has continued until the present day. Many countries, including Ireland, either have or are in the process of developing national alcohol policies. The arguments for these policies have recently been strengthened by the agreement by the European member states of the World Health Organisation (WHO, 1992) on joint action to reduce the harmful effects of the consumption of health damaging and dependence producing substances. Alcohol is identified as a priority within this group of substances. The WHO have set a target of a 25 per cent reduction in per capita alcohol consumption on 1980 levels, to be attained by the end of this decade. The strongly interventionist approach by government bodies encouraged by the WHO is motivated by the strong correlation between alcohol consumption and a range of health and social problems. In this context the WHO sees the trend towards liberalisation of alcohol availability in most European countries as a regressive step in terms of public health policy. There are, however, other important considerations related to the use of alcohol in society that need to be considered in addition to the public health issue. These other aspects need to be considered before embracing an interventionist approach by government bodies as encouraged by the WHO.

The Irish Department of Health, partially in response to initiatives by the WHO and the European Commission, are formulating a national policy on alcohol use. Indeed, the ESRI were requested to provide information to the Department on various statistical and economic issues that arose during this process. The range of topics involved was wide, because alcohol continues to play a very prominent role in many social interactions in modern life and raises a profusion of diverse issues and interests. Many of these issues have received attention in Ireland in the past but in the current circumstances it is appropriate to reconsider them and hence this ESRI research series paper was written.

Alcohol policy must be formulated with due regard to the medical, economic, social, cultural and political contexts in which it must operate. Any comprehensive treatment of this topic therefore must involve examination of evidence across a range of disciplines and this paper draws on the evolving views and findings in the international literature on alcohol. This has necessarily drawn the authors into assessing findings in disciplines where they can claim to have no primary expertise but where results of relevance to the Irish situation have been reported. Given the very limited data and analyses on some topics, this approach was unavoidable. In

this and indeed in other respects, this paper is written very much in the spirit of Walsh (1980), whose treatment of the economic and social issues was as comprehensive as the data permitted. More has since become available and relevant research findings have appeared in the literature. However, there are still large gaps in information and consequently there are many topics on which conclusions can only be very tentative.

1.2: *Historical Background*

Concern over the use of alcohol and policy recommendations for its curtailment have had a long history internationally. Alcohol, in particular wine, has many biblical connotations. The church was the dominant institution of social control in many societies and it was from a religious stance that alcohol abuse was initially condemned, alcohol being viewed as the "demon drink". To over indulge in alcohol was to reveal moral defects and drunkenness carried many civil penalties. In the last century, increasing concern about drunkenness and its consequences induced the government to impose stricter controls on the number of outlets and their opening times.

Eventually, the alcohol problem moved from being seen only in its moral context as deviant behaviour to becoming medicalised. The disease concept of alcohol began to take root particularly in the USA, where it was offered as an antithesis to the Puritan doctrine of free will. This view became the cornerstone for the temperance movement, which felt that alcohol was capable of destroying the life of anyone who succumbed to its influence. This movement gathered momentum throughout the 19th century in many countries including Ireland (Kerrigan, 1992), culminating in a periods of prohibition on alcohol in Canada, Finland, Norway and the USA in the years after World War I. The influence of the temperance movement waned internationally after World War II with the advent of a new consumer era, but the pioneer abstinence societies still attracted large numbers of members in Ireland up to the 1970s.

The disease concept of alcoholism was refined by Jellinek (1960) in a model of alcoholism where he argued that certain individuals had a disposition to become alcoholics. This removed the responsibility for their actions from alcoholics, who became seen as victims requiring treatment. This view of alcoholism as a disease gave impetus to the approach to control the problem by concentrating on medical treatment rather than on prevention. The role, if any, for prevention was to facilitate early detection to allow for earlier treatment. The medical view of the disease concept was strongly adhered to by groups such as Alcoholics Anonymous (AA) set up in 1935 in Ohio. Interestingly, the first European branch of AA was set up in Dublin in 1946. Jellinek also suggested that there was a sharp distinction between those with the disease, to whom no blame should be attributed, and those deserving of moral censure for irresponsible drinking (Beaucamp, 1980). This theory also found favour with the alcohol industry because the majority of the population were seen as immune from the disease, so that they obtained only beneficial effects from alcohol consumption.

1.3: *The Irish Historical Experience*

McCoy (1991) reviewed thirteen papers dealing with the abuse of alcohol read to the Statistical and Social Inquiry Society of Ireland over the period 1849 to 1973. Heavy drinking would seem to have been the norm during the early 19th century in many countries, including Ireland. The issues of alcohol abuse dealt with in the past included many of those still discussed in the present day. These included concerns about alcohol related crime, the social costs imposed by alcohol abuse, the role of education in altering behaviour, punishment for alcohol abuse, treatment of alcoholics, vested interests in the alcohol issue, the causation between alcohol and poverty, the hereditary nature of alcohol dependence, alcohol abuse as a national trait, state interference versus individual liberty and the legislation on alcohol.

James Haughton (1849a) encouraged abstinence from all liquors because "drink was at the root of all crimes". He reported on the social and moral wrong occurring due to excessive expenditure on alcohol which "shortens human life and deprives families of their basic sustenance". Ross (1875) claimed that directly or indirectly alcohol was involved in one half of all summary proceedings in Ireland and some social costs of alcohol were well documented during this period. The convictions for drunkenness in 1873 seem to have been about thirty fold greater than a century later. Some authors complained about the trifling fines inflicted as punishment for drunkenness and called for more punishment for the drunkard (Daly, 1897). Others called for the publican to be liable for supplying excessive drink. Other papers stressed the role of education in reducing the levels of alcohol abuse, even limited education being "no inconsiderable preservative against crime".

The treatment of alcoholics aroused as much debate a century ago as it does today. The Reverend Osborne (1895) viewed the problem as one of a disease without a cure. Ross opposed treating habitual drunkards as persons of unsound mind, but rather would punish them for "choosing to drink". Three vested, and often conflicting, interests in the use of alcohol were identified even then, particularly as regards trading licences. These interests were the Revenue Commissioners who favoured more licences for more excise duties, the Temperance Movement who were against more outlets and the "Liquor Trade" who wanted free trade but restrictions on new licences. "The traders were not unwilling to enjoy the increased value of existing licences by prohibiting new ones, fight fiercely against further restrictions on their present establishments" (Daly, 1897).

Hancock (1877) made the connection between alcohol use and poverty offering economic factors, like lack of employment and low wages as reasons for excessive drinking. However, this argument that poverty induces alcohol abuse has not always remained consistent, Blaney (1973) says "poverty was blamed but nowdays affluence is frequently mentioned". It was also suggested that the desire for alcohol stimulants was transmitted from generation to generation (Haughton, 1858). Osborne also felt there was "congenital tendency to alcoholism that is inherited". He felt state interference was necessary to reform the marriage law to prevent those "in the habit of excessive alcoholism" from entering matrimony. He added that "the facts of heredity justify the state forbidding marriages which threaten to become sources of disease and crime".

The notion of alcohol abuse as an national trait was also explored by Blaney, who cited high rates of alcoholism of Irish exiles abroad. Theories cited by Blaney included environmental factors such as "damp climate and inclement weather which caused Irishmen to drink spirits as a stimulant", as well as the lack of alternatives to drink. This latter factor led to the Irish Temperance League developing the "Cafe and Coffee-House Movement" at the end of the last century. Excessive availability of alcohol was also blamed for abuses, as was racial disposition, and socio-cultural factors such as the role of alcohol for social interaction. The custom of the "round system", or drinking in large groups also received comment. Dr T.J. O'Meara writing in the *British Medical Journal* in 1904 felt intemperance was a national trait of the Irish "the excitable, high-strung, nervous temperament of the Irish race ..... in the essentially neurotic and mercurial Irishman easily overjoyed and as easily depressed and accustomed to treat both conditions by whisky". The Gaelic League organisation also attempted to tackle this perceived Irish trait of intemperance by attempting to eliminate customs of binge drinking, such as "drowning the shamrock" on St Patrick's Day and the "waking" of the deceased during funerals.

There was also debate on the issue of the State's use of legislation to control individual behaviour. Tod (1875) felt that drunkenness should not be viewed as a crime but rather as a sin and a vice. She felt that interfering with individual liberty to lead people to right-doing was mistaken because "to supersede the conscience is to weaken it". Reverend Osborne justified State interference on the grounds that it would ensure "the greatest happiness of the greatest number". Ross felt there was a need to hold the individual culpable for his actions and the "need to apply preventive or punitive law to ascertained people who require reformation or punishment". Many of the papers dealing with issues on alcohol abuse in the last century tended to concentrate on legislative measures. Haughton (1849b) claimed there was a need for legislative prohibition of alcohol to aid moral suasion and supported this by use of statistics on 24 English counties. Those counties where the proportion of public houses to population was greatest and with the level of education and religion above the national average also had a proportion of crime above the national average. He also felt that legislation should be aimed at the elimination and not just the regulation of alcohol.

Lawson (1902) presented a paper to the Statistical and Social Inquiry Society of Ireland which was inspired by the legislation on Irish licensing laws of that year. The licensing statute went as far back as 1635 with the power of franchising licenses passing to the Commissioners of Excise in 1737. In previous centuries, free trade in drink had initially prevailed, but in the 15th century the opening of alehouses began to be prohibited because of "the abuses and disorders in tippling houses" (Daly, 1897). The foundation act for the present Irish licensing laws dates from 1833. The power to grant licences was vested with local magistrates at the Quarter Sessions. Lawson suggested malpractice was common by "canvasing and packing of benches" which led to excessive numbers of public houses at that time. He offered the example of Ballinlough in Co. Roscommon which in 1902 had a population of 200 and had 8 public houses. Out of 11 new houses built that year 9 of these new

housesholders applied for and received licenses to sell liquor. The 1902 Ireland Licensing Act curtailed significantly the granting of new licenses to try to stop such abuses.

Legislation in 1906 curtailed drinking hours by earlier Saturday closing and reduced Sunday hours in the cities by two hours. Subsequent measures continued the trend of restrictions on the trader. The Intoxicating Liquor (General) Act 1924 faced the problem of illicit distillation by use of sanctions on the selling of alcohol without licences in "shebeens", as these illegal drinking outlets were commonly known. In 1927 the Minister for Justice introduced a two hour midday closing of public houses, known colloquially as the "holy hour", to keep urban workers from lunch-time drinking. This 1927 legislation also introduced the concept of the Special Exemption for "special" functions. Later legislation began to reverse the trend, at least in some respects. In 1962 less restrictive opening hours were introduced along with 10 minutes "drinking-up time". The 1988 Intoxicating Liquors Act, encouraged by the alcohol trade, extended opening hours and drinking-up time. Also under encouragement from Bord Failte, but not from the licensed trade, it granted special restaurant licences to serve alcohol.

1.4: *Outline of the Paper*

The paper sets out the background and factors that determine the economic and social implications of alcohol use in Ireland. The paper is divided into chapters in the following order. Chapter 2 sets out the significance of alcohol for the Irish economy by examining its contribution in terms of employment, tax revenue and contributions to exports. This chapter also examines alcohol's perceived benefits as a consumption good and some of the issues that relate to this. Chapter 3 examines the pattern of alcohol consumption in Ireland over the last three decades, mainly using time series data, and reviews the previous research carried out on this topic. This chapter derives estimates of the sensitivity of alcohol to changes in prices and incomes, which are employed in subsequent chapters. It also uses international data to compare Irish alcohol consumption and expenditures with the corresponding figures for other countries.

Chapter 4 examines the pattern of household expenditures on alcohol on a much more disaggregated basis, using cross-section data from the CSO Household Budget Surveys. Expenditures are analysed separately for different types of household to detect the effects, if any, of urban-rural location, planning region, household size, household composition and social group. The possibility is investigated that such household characteristics, besides directly influencing alcohol intake, may interact with the consumption-income relationship.

Chapter 5 turns to the problems and costs associated with the misuse of alcohol in Ireland. The difficulties in evaluating the consequences of alcohol abuse, be they medical, psychological, economic or social, are discussed. Conclusions are attempted in the context of the WHO proposed target of a 25 per cent reduction on 1980 levels, that is about a 20 per cent reduction in current consumption given the decline in consumption in the last decade. Chapter 6 discusses the merits and demerits of the most frequently advocated strategies to reduce the average level of

alcohol consumption in society. In so doing, it reviews some of the theories about population drinking patterns and some possible causal factors in determining them. It considers the feasibility of some strategies and the constraints that will limit them. Finally, Chapter 7 contains a brief summary of the conclusions reached in the paper.

Chapter 2

SIGNIFICANCE OF ALCOHOL TO THE IRISH ECONOMY

2.1: *Introduction*

There are at least three aspects to the economic role of the alcohol industry in Ireland. First, there is the employment provided in the production and retailing of alcoholic drink. Second, there is the contribution to State revenue provided by excise taxes and VAT. Third, there is the contribution alcohol exports make to the balance of payments. These aspects will be considered in turn in the following sections and in a final section of this chapter we will look at aspects of consumer satisfaction, or benefits, associated with alcohol consumption. It is important to note that although a complete ban on the production and distribution of alcohol would eliminate these contributions totally, this paper deals with the more plausible context of a reduction of at most one quarter in average alcohol consumption. Then it is reductions in contributions, and possible compensating effects due to consumptions of other goods, that are most relevant. However, it is reasonable to commence with an examination of alcohol's total contribution.

2.2: *Employment in the Alcohol Industry*

Employment and its evolution over time in the drinks production sector is shown in Table 2.1. The category "Other" does include soft drinks, but there are some justifications for allowing at least a portion of this employment to be counted in with alcoholic drinks. The production is partly of goods complementary to alcohol, in that some spirits are drunk with "mixers". It is also arguable that some consumption of non-alcoholic drinks is by the companions of alcohol consumers visiting public houses and that this consumption might cease if alcohol consumption did. Total employment in drinks manufacture was static or slightly increasing from 1975 until 1981, after which it decreased steadily until 1987 and was then at 62 per cent of the 1981 figure. The major factor was the rationalisation and increased productivity in beer production after 1981. The total employment provided in production is rather small, although there are extra factors, that will be returned to shortly.

Table 2.2 shows employment in drinks production as a percentage of total industrial employment and of total employment in Ireland. By 1987 employment in this production sector had declined to about $2^{1}/_{2}$ per cent of total industrial employment or a $^{1}/_{2}$ per cent of the total at work. However, additions have to be made to these figures. Inputs to the processes of drinks production are provided by other sectors and so employment in these is partially attributable to the existence of an alcohol industry. Inputs imported from outside Ireland must be subtracted, but then import content is relatively low in the drinks industry. Purchased inputs

Table 2.1: *Employment in Drinks Production.*

Year	*Beer*	*Spirits*	*"Other"*	*Total*
1975	4,800	300	2,660	7,790
1976	4,630	390	2,600	7,620
1977	4,590	340	2,570	7,500
1978	4,680	360	2,680	7,720
1979	4,780	400	2,680	7,860
1980	4,810	510	2,770	8,090
1981	4,810	770	2,720	8,300
1982	4,240	800	2,520	7,560
1983	3,830	810	2,220	6,860
1984	3,530	800	2,040	6,370
1985	3,460	710	1,800	5,970
1986	3,340	670	1,690	5,700
1987	3,150	650	1,580	5,380
1988	2,980	520	1,670	5,170
1989	2,700	550	1,700	4,950
1990	2,500	600	1,600	4,700
1991	2,400	500	1,700	4,600

Notes: "Other" includes Wine, Cider and Soft Drinks.
Source: CSO *Census of Industrial Production*, various years.

from agriculture (mainly malting barley) cannot easily be argued to sustain employment in farming in which there are alternative (if less lucrative) crops. This is especially true of malting barley growing farms, which occur in the best arable soils with the widest range of land use and that are often the most structurally efficient.

Table 2.2: *Employment in Drinks Production as a Percentage of:*

Year	*Total Industrial Employment*	*Total at Work*
1975	3.8	0.73
1979	3.3	0.69
1983	3.0	0.60
1987	2.6	0.50
1991	2.1	0.41

Sources: CSO *Irish Statistical Bulletin*, various issues,
CSO *Labour Force Survey*, various issues.

Jobs in the grain merchant firms and in the sectors supplying inputs could be affected by a reduction in alcohol production leading to a fall in the malting barley acreage. However, much would depend on what enterprises replaced malting barley

on farms. Other cereals, like feeding barley, could demand at least as many inputs. It could even be argued that at least some of the expenditure redirected by the consumer from alcohol could channel through to agricultural products.

Employment in the retailing of alcoholic drinks is much larger than in the production sector. This is obvious from the fact that there are about 11,000 fully licensed premises in the State. It is, of course, true that small family-run public houses in rural areas may not have any official employees, but they still keep their proprietors at work and probably members of their families also. In larger public houses, at least some of the barmen are employees and if meals are provided, other categories of staff may be employed also. The high frequency of part-time staff, especially when the labour input is by family members, complicates the calculations and various data sources disagree. Indeed, disagreement extends to full-time employment also. For example, O'Hagan and Scott (1990) using a sample survey commissioned by the Drinks Industry Group, estimated much higher employment than the CSO's Census of Distribution does. Differences are not due to sampling variation, but to categorisation and definitional divergencies, and we will take the higher figure on an "at most" basis.

Linkage employment is also difficult to estimate. Since many public houses supply some sort of meal, and almost all sell cigarettes and snack items, they clearly purchase inputs from other sectors besides the drinks industry. They also obviously require inputs as regards their own furniture and fittings and entertainment equipment, if any. However, if people did not eat meals in public houses or buy cigarettes in them, they would presumably purchase these commodities in other premises that also require equipment, decoration and maintenance, so counting all the jobs as linked to the drinks trade is unreasonable. Overall we would estimate a total of at most 33,000 full-time, or 48,000 including part-time, jobs in the alcohol industry and drinks trade in 1990. Of these, less than 5,000 occur in alcohol manufacture and 3,000 arise from linkage.

It is worth noting that this is a higher total than Walsh (1980) gave in his study in spite of the substantial decline in employment in manufacturing that has occurred in the meantime. Walsh used the CSO figures and the scope for discrepancies with sample survey estimates has already been mentioned. On the other hand, a higher total still is given by John and O'Hagan (1982), which was reproduced in the third report of the Commission on Taxation (1984). It gives much higher weight to the linkage effect, leading to correspondingly higher total figures.

Turning from total employment figures to the consequences of a one quarter reduction in average alcohol intake, the employment in the retail sector is obviously the most problematic. If the alcohol intake reduction was achieved without a reduction of expenditures, that is by diverting a proportion of drinking to lower or zero alcohol drinks, there need be no employment reduction in the retail, nor indeed the production, sectors. Even a real reduction in expenditure on alcohol need not imply a reduction in retail employment if, for example, people substituted food for alcohol in public houses. Given existing continental European patterns and assuming Irish behaviour shows some tendency to converge towards them, this is not implausible. As we will discuss in more detail later, the Irish drinkers seem to

attach weight to the public house environment and this might reinforce the scenario just described. So a decreasing expenditure on alcohol need not imply a decreasing expenditure in public houses.

A reduction in employment in production would occur, assuming that a compensating increase in exports is unlikely. There would be some compensating increases elsewhere due to the diverted expenditures. The extent of this increase in alternative employment would depend on the commodities that alcohol expenditures are diverted to, particularly whether they are produced domestically or imported. The scenario of diversion of expenditure to food consumption in public houses is unlikely to replace lost production jobs considerably, since this spending would mean lower food purchases elsewhere. The actual number of job losses in such a situation would depend on marginal productivity and other issues, both in the alcohol industry and elsewhere. Something of the order of 1,000 jobs could be involved, which is about a quarter of 1 per cent of all jobs. This may not seem very great, but annual net job creation in Ireland throughout the 1980s was usually only a few thousand and sometimes negative. It is true that in the 12 months to April 1990, net job creation was about 30,000 but that was exceptional.

In conditions of steady economic growth, which were not true of the 1980s, an annual net job creation figure of 15,000 to 20,000 might be achievable and then a fraction of one year's job creation could compensate for the fall in employment in drinks production. However, given current levels of unemployment, the prospect of even greater job creation requirements is not one to be assessed lightly. Preservation of the jobs in production, while maintaining compatibility with an overall reduction in alcohol intake, implies a return to the scenario of diverting drinkers to lower alcohol beverages. Consumer preferences and willingness to substitute drinks would be critical. Evidence, based on both analysis of Irish data and drawn from the literature, will be considered in later chapters. Unfortunately, the limited availability of data on all except broad categories of drinks will constrain analysis considerably.

Jobs losses in the retail sector would also be a matter for concern, but as already suggested, it is less evident that a reduction in expenditure on alcohol proper need imply job losses, even in the public house sector. If losses did occur in pub jobs, extra jobs would be expected in other retail areas. The composition of the average reduction in alcohol could also matter. Jobs would presumably be less affected if the decrease was entirely in alcohol consumed at home.

2.3: *Government Revenue Through Alcohol Taxation*

The State obtains revenue from the consumption of drink in two main ways. These are the excise taxes on alcoholic drinks and the value added tax passed on to consumers. There are other sources of tax revenue too, although these are either minor, or perhaps not clearly attributable to alcohol. In the former category are the licence fees and rates paid by public houses and in the latter the income tax paid by employees of the industry or trade. Of course, these people would be paying tax if employed in a different sector and this aspect depends on the job creation situation

already discussed. Changes in the 1992 Finance Act are expected to double the tax revenues from liquor licences to IR£2 million in 1992 and treble it to IR£3 million in 1993.

Excise duties collected in the years 1975, 1979, 1983 and 1987 are shown in Table 2.3 in both nominal and real (adjusting for price inflation) terms.

Table 2.3: *Excise Duties on Alcohol in Nominal Terms (IR£ million) and Real (IR£ million in 1991 prices) in parentheses*

Year	*Beer*	*Spirits*	*Other*	*Total*
1975	66.1 (276.6)	48.8 (204.2)	3.7 (15.5)	118.6 (496.3)
1979	118.8 (304.0)	86.5 (221.4)	9.0 (23.0)	214.3 (548.4)
1983	232.2 (322.7)	116.0 (161.1)	24.0 (33.6)	372.2 (517.4)
1987	243.2 (275.8)	108.9 (123.5)	28.9 (32.8)	381.0 (432.1)
1991	282.0 (282.0)	121.3 (121.3)	38.0 (38.0)	441.3 (441.3)

Source: Revenue Commissioners *Annual Report*, various years.

In real terms the excise take on beer rose, although not dramatically, from 1975 to 1983. The take on spirits decreases in real terms between 1979 and 1983, but cross-border effects to be discussed in the next chapter are operating here. An estimate quoted in the third report of the Commission on Taxation (1984) values the excise duty and VAT forgone in 1983 at IR£60 million.

The excise quantities can be seen in perspective if expressed as a percentage of Government current receipts. The figures are given in Table 2.4.

Table 2.4: *Excise Duties on Alcohol as a Percentage of Total Current Government Receipts*

Year	*Beer*	*Spirits*	*Other*	*Total*
1975	5.5	4.1	0.3	9.9
1979	4.4	3.2	0.3	7.9
1983	3.7	1.9	0.3	5.9
1987	2.9	1.3	0.3	4.5
1991	2.7	1.2	0.4	4.3

Sources: CSO *National Income and Expenditure*, various years, Revenue Commissioners *Annual Report*, various years.

Clearly the importance of excise duties as a component of total government revenue has been declining over time, although that is not strictly true of "Other" alcohol. Excise duties on alcohol were almost one-tenth of Central Government current revenue in 1975, but are now under one-twentieth. Excise duties on alcohol are even more significant as a source of tax. The receipts from excise duties on

alcohol as a percentage of total tax receipts declined from 13.1 per cent in 1975 to 5.5 per cent in 1991. Of course, this is not because excise revenue has fallen drastically, but rather other sources of revenue have been increasingly tapped.

The loss of revenue associated with a one quarter reduction in consumption obviously depends on the mechanism used to achieve the reduction. For example, higher excise duties would increase revenue from the remaining consumption. The position in this example is complicated by the proposal to harmonise or approximate taxes in the European Community as will be discussed later. Assuming the reduction was achieved by other means, replacement sources for something less than 2 per cent of revenue would be required, unless cost savings to the Exchequer resulting from fewer alcohol-related problems are a counterbalance. This topic will be discussed in Chapter 5 but there would be difficulties replacing excise duty revenue, because resistance to many forms of taxation is very high and there seems to be a near consensus currently that the overall burden of taxation should be lowered.

Value added tax on drinks is just as substantial as a revenue source as excise duties since it amounts to a quarter of retail price, which roughly is about four times the excise duty. However, calculating reductions in VAT revenue due to reduced alcohol consumption may not be appropriate. If the money is not spent on alcohol, but on other commodities, then the VAT revenue will not fall, unless these other commodities are subject to lower rates of VAT. However, the excise duty on alcohol has a significant knock-on effect for VAT revenues arising from the manner in which products are taxed. VAT is calculated on the "pre-VAT" prices, which in the case of alcohol includes the excise duties. Lowering alcohol excise rates would significantly lower VAT receipts from alcohol. The EC has adopted a "minimum rates" approach to VAT in the Community. Alcoholic drink will subjected to the standard rate of VAT with no provision to take account of the alcohol content.

There may be a fundamental accounting flaw in treating the VAT as essentially a tax on alcohol. It would be like treating a restaurant's VAT charge as a tax on food instead of recognizing that the value added derives partly from the premises and personal services and so on. It is these differing national accounting conventions that are responsible for the apparently high Irish expenditure on alcohol compared with other countries, which will be discussed in the next chapter.

2.4: *Role of Alcohol in Foreign Trade and the Balance of Payments*

A small country like Ireland that lacks many raw materials, like oil and metals, must import many commodities essential to economic and social existence. These have to be paid for by exports and so at least some section of Irish manufacturing industry must sell abroad as well as on the home market. In the past this need to match imports by exports, or balance of payments constraint, has been a severe check on the capacity of the Irish economy to generate employment and higher living standards. Therefore, it is worth looking at the role of the drinks industry in regard to imports and exports. Obviously wines, certain spirits and some brands of beer are imported while Irish production of beers and spirits is partly exported. Table 2.5 shows imports and exports in value terms.

Table 2.5: *Imports and Exports of Drinks (IR£ million)*

	Beer		*Spirits*		*Other*		*Total*	
Year	*Import*	*Export*	*Import*	*Export*	*Import*	*Export*	*Import*	*Export*
1975	0.3	14.2	6.7	3.8	4.9	0.1	11.9	18.1
1979	0.4	16.9	16.1	27.5	12.3	0.4	28.7	44.8
1983	2.9	26.4	17.0	112.1	15.5	0.4	35.4	138.9
1987	16.4	31.2	23.2	158.1	22.6	1.0	62.2	190.4
1991	38.2	53.8	33.8	245.8	39.4	2.3	111.4	301.9

Source: CSO *Trade Statistics*, various years.

While the values of imports and exports are expressed in current values and so contain price inflation effects, it is still clear that exports have grown rapidly relative to imports overall. This is largely due to increases in exports of spirits which have changed from about half the import figure in 1975 to 7 times it in 1987. Although beer exports have continued to exceed imports, imports have increased such that exports exceed them about twice in 1987 compared to 40 times them in 1975. The exports to imports value ratio for total alcohol is shown in Table 2.6 as are the ratios of the total value of alcohol imports and exports to the total values of all imports and exports.

Table 2.6: *Ratios of Alcohol Export and Import Values*

Year	*Alcohol Exports / Alcohol Imports*	*Alcohol Imports / All Imports*	*Alcohol Exports / All Exports*
1975	1.52	0.007	0.013
1979	1.56	0.006	0.013
1983	3.92	0.005	0.020
1987	3.06	0.007	0.018
1991	2.71	0.008	0.020

Source: CSO *Trade Statistics*, various years.

The ratios of exports to imports make clear the changes from 1975 to 1987. It is possible the 1983 ratio is a little too high in at least one sense because of the cross-border effects discussed above. Some of the exports were to Northern Ireland and were smuggled back across the border and consumed in the South. However, this phenomenon does not invalidate the doubling of the ratio between the 1970s and the 1980s.

Clearly, alcohol imports are not a very large component of total imports, being less than 1 per cent in all four years. Alcohol exports were much more important in percentage terms, though not in volume or value, in the past than in the period covered by Table 2.6. For the first 30 years of Irish independence alcohol was the largest non-agricultural export and in 1960 alcohol still amounted to over 4 per cent of Irish exports, while it has dropped to 1.3 per cent by 1975. This was because

Irish economic growth in the 1960s and 1970s was largely export led and was fuelled by attracting foreign companies to Ireland to manufacture high technology commodities for export. Their output came to dominate the trade statistics and the share of indigenous industry in exports fell correspondingly. In this context, the increased share to 2 per cent of alcohol exports in the 1980s is a remarkable marketing achievement.

Alcohol consumption in Ireland need not be directly related to exports, although there are clearly advantages to companies in having a large home market. One could visualise a scenario in which home consumption of alcohol fell while exports increased. This would retain the beneficial effects of the industry for the balance of payments (and indeed for employment), while reducing the deleterious effects of alcohol on the Irish. Whether policies to achieve such a scenario could be considered ethically desirable is another matter. The worst scenario for Ireland would be a fall in exports and a rise in imports, without any drop in consumption. Employment and the balance of payments would suffer without any health gains. Obviously, any measures that might reduce the output of the Irish alcohol industry would need careful assessment in case they favoured increased imports rather than decreased consumption.

2.5: *Alcohol Consumption as a Consumer Good*

People do not have to drink alcohol; they choose to do so in preference to spending their money otherwise and this must imply that they perceive themselves deriving benefits from alcohol consumption or from activities associated with alcohol consumption. Economists are inclined to reason on the above basis that the observed spending behaviour of consumers is the best guide to their valuations of the benefits of alternative commodities. This underlies many arguments in economics, even the use of the Consumer Price Index as a measure of inflation. If consumers are not permitted to purchase their preferred combination of goods, they must be satisfied with a second-best preference and they could claim their welfare has been reduced.

Indeed some economists would argue that all the benefits of alcohol outlined already in this chapter, like the contributions to employment, to revenue and to exports, are not benefits at all, but just the consequences of how consumers choose their spending patterns. If they choose differently, other industrial and retail sectors would provide the jobs and revenue. The economists claim that only the consumer's satisfaction can be counted as the real benefit; see, for example, Leu (1983). Such a view while theoretically sustainable, makes strong assumptions about the efficiency of operation of an economy. In Ireland, the issues of unemployment and national debt are such that they cannot be left out of the direct reckoning.

The argument against reducing the welfare consumers perceive they derive from their alcohol consumption can be countered on either of two main grounds. First, they may not really be acting to maximise their welfare even if they can purchase their preferred bundle of goods. Second, their choices may have effects

on other people's welfare, and restricting their ability to maximise what they perceive as their own welfare may be fully justified if it prevents someone else suffering.

The first argument could take the line that, for some people, alcohol is an addictive chemical so that individuals are no longer making choices of their own free will or are insufficiently aware of long-term effects on their health to weigh up their choices properly. Economists like Becker and Murphy (1988) would argue that addiction need not negate analyses based on assumptions of utility maximisation. Using a complex and dynamic model of addiction they argue that addicts are usually rational in the sense that they possess stable preferences and they maximise utility consistently over time. Even if the addiction or ignorance case is true for some people, is it fair to restrict the options of everyone else for that reason? Presumably health risks are something that the average person makes deliberate choices about and may rationally choose to accept. Some sports, for instance, are physically dangerous yet prove to be popular leisure activities.

The second argument, on effects of alcohol on people other than the consumer, is perhaps a stronger one. A person is presumably more entitled to put their own health at risk than to put someone else's. Even in the case of their own health, there is the issue that their treatment may not be at their own expense and may draw on other people's resources. But the question remains of whether it is justified to restrain all drinkers to control the behaviour of a few, unless one believes all drinkers need to be restrained.

To a degree, it is activities associated with drinking that are pleasurable and owners of public houses realise that. The report by O'Hagan and Scott (1990) contains some information on auxiliary services offered in public houses. Bar food is available in 36 per cent of all licensed premises, at least to the extent that tea/coffee and sandwiches/rolls are available. In Dublin the percentage rises to 75 per cent. Full hot meals are available in 17 per cent of all pubs and salads or buffet meals in 19 per cent. Over 75 per cent of licensed premises offer some form of entertainment, although this can range from electronic games machines, through darts or pool games, to live shows, especially musical groups. Over 20 per cent of all pubs provide live shows on at least some week nights and the proportion is far higher in Dublin and in holiday resorts.

A certain amount of research abroad, although on relatively limited sections of populations, has looked at the enjoyment derived from drinking and perceptions of associated pleasant or unpleasant activities. For example, Nystrom (1992), conducted a study of over 2,000 Finnish university students ascertaining their assessments of positive and negative consequences of drinking. A wide range of consequences was possible including, for example, sexual activity. The results were that 75 per cent of females and 80 per cent of males had more positive than negative consequences to report. How the consequences relate to actual quantities of alcohol imbibed is unclear. However, another study on US students by Geller *et al.* (1991) suggests that fraternity parties went as well on lower alcohol levels.

There is a lack of direct evidence from Irish consumers on the relative weight they attach to ancillary activities associated with drinking, other than those revealed by the publicans in providing facilities for these activities. An interest in sport or eating out can easily coexist with drinking. A marketing study by Cribben (1989) involved interviews with young adults about preferred social activities and leisure interests. Going to licensed premises was considered almost as enjoyable as attending sporting events of special interest, or eating in restaurants, and ranked well ahead of visiting cinemas, watching TV or video at home, etc. The proportion of drink consumed outside of the home is higher in Ireland than in most other European countries, see Table 2.7 for comparisons in beer consumption.

Table 2.7: *Home Consumption of Beer as % of Total Sales, 1990*

Country	*% of Total Sales*
Denmark	74
France	65
The Netherlands	62
West Germany	60
Italy	57
Portugal	37
Belgium	31
Spain	25
UK	20
Ireland	6

Source: Thurman (1992).

While it may be going too far to say that the enjoyment derivable from a sporting activity is necessarily enhanced by the subsequent alcohol consumption, there are cultural factors that strongly link these activities, for example, the tradition in Ireland of celebrating sporting successes with alcohol consumption in public houses. Such a tradition is unlikely to have survived if consumers did not derive benefits from alcohol consumption. These real welfare losses need to counterbalanced against any gains resulting from curtailment of drinking.

Chapter 3

CONSUMPTION OF ALCOHOL

3.1: *Introduction*

This chapter deals with the quantification of the economic factors that influence trends in alcohol consumption. It consists of a review of previous research on this topic in Ireland, along with statistical and economic analyses of recent data. We commence with a brief outline of the current situation as regards expenditure on, and consumption of, alcohol in Ireland. As recorded in the national accounts, expenditure on alcohol amounted to IR£1.7 billion in 1990, or 9.5 per cent of disposable income. The breakdown of the expenditure between beer, spirits and wine (including cider and sherry) was 64, 27 and 9 per cent respectively. Most of this consumption takes place in public houses, of which there are about 7,500, or 1 per 330 adults. The total of licensed premises is higher, currently about 11,000. However, actual average alcohol consumption per head, measured in units of pure alcohol, is not high in Ireland by international standards. The Irish figure is among the lowest in Europe, being less than half the French or Spanish figures and just over 70 per cent of the UK quantity.

Irish alcohol consumption measured in terms of expenditure per head, as distinct from quantity consumed, is often presented as being by far the highest in Europe and it has been claimed that this shows a heavy commitment to drinking, given the high alcohol prices. A superficial examination of international statistical comparisons would seem to confirm this. However, these statistics on alcohol expenditure are misleading because they are not calculated on the same basis internationally and it is not possible to make valid comparisons of expenditure per head using them. Where comparisons have been made in the publications of various international agencies, such as the United Nations and EUROSTAT, this statistical problem has not been appreciated. We discuss these differences in national accounting conventions in Section 3.5 and we suggest that Ireland would no longer be dramatically out of line as regards alcohol expenditure per capita if the European conventions on alcohol expenditure were introduced into Irish statistical accounting.

However, as regards evaluating the factors that affect alcohol consumption, only limited information can be gained from a picture of the situation at one point in time. Alcohol consumption depends on prices and income and these factors have changed over time. So have other factors like awareness of the health risks associated with drinking and attitudes to driving motor vehicles after alcohol consumption. However interesting point in time information about consumption and expenditure may be, more valuable deductions are likely to follow from examination of time series data on alcohol use. Such series are available from Revenue Commissioners'

records on consumptions of beer, spirits wine and cider. So a substantial part of this chapter, Sections 3.3 and 3.4, will be concerned with how patterns have evolved over time within Ireland, and with what can be deduced from this evolution. For a technical reason, to be described later, some cross-sectional data from the CSO's Household Budget Survey will also be employed in a supplementary role.

Income and price elasticities are important summary statistics for explaining behaviour. An income elasticity is the percentage increase in alcohol consumption given a 1 per cent increase in income. A price elasticity is the percentage change in consumption given a 1 per cent increase in price. Own price elasticities are expected to be negative, in that consumption falls as price rises, and cross-price elasticities ought to be positive, in that an increase in relative price of one form of alcohol should lead to an increase in the consumption of a cheaper form. Considerable effort has been put into estimating these quantities and comparisons will be made with figures obtained in previous studies for Ireland.

First we must review the earlier work on economic factors influencing alcohol consumption in Ireland which has appeared in various reports and journals.

3.2: *Review of Previous Research Related to Irish Alcohol Consumption*

Walsh and Walsh (1970) compared alcohol expenditures and consumption per adult in Ireland in the late 1960s with the corresponding figures for other countries. They found the position for Ireland to be very similar to that for the UK as regards total quantity per person. Using time series data covering the period from 1953 to 1967 they related consumption per adult of beer and spirits to prices and income. Over the period the volume of consumption had risen steadily, by 26 per cent for beer and 76 per cent for spirits. They found statistically significant effects of income, but no significant price effects at all. The latter finding did not mean that price really had no impact, but rather that the magnitudes of the effects were too small to be detected with the limited data available to them. They concluded that the income elasticity for beer was low (between 0.5 and 0.8), while that for spirits was high (between 1.5 and 2.1). The terms "necessity" and "luxury" are often used for goods with income elasticities below and above unity respectively. Beer would thus be described as a necessity and spirits a luxury good. The share of expenditure on a luxury good rises as income does, while the reverse is true for a necessity.

Walsh and Walsh also used the household budget data obtained from the CSO's 1965-1966 survey to see how expenditure differed about the national average according to social class. Of course, since incomes differ between social classes, clear cut conclusions are difficult, and it is also true that the CSO believe there is serious under-reporting of alcohol expenditures in their surveys. However, Walsh and Walsh did tentatively conclude that, conditional on income, socio-economic groups corresponding to unskilled and semi-skilled manual workers appeared to spend a larger proportion of their income on alcohol.

At the outset of their paper, these authors had expressed reservations about the extent to which studies of average intake can establish anything about the prevalence of excessive drinking by individuals within the population, and they quoted a World Health Organisation warning about such deductions. However, the

orthodox view has been that the proportion of excessive drinking may indeed be highly related to per capita consumption, following the arguments of Ledermann (1956), dealt with in Section 6.2. This view has been disputed; see, for example, Duffy (1977), but most authors of studies on Irish alcohol consumption do tend to implicitly, if not explicitly, accept a relationship between average consumption and the prevalence of excessive consumption.

One obviously important parameter is the proportion of non-drinkers in the population, since the larger this is, the greater is the multiplier to published average consumption that accords with actual consumption by drinkers. O'Connor (1978) looked at the proportions of drinkers among young people in Ireland as compared with England, and also studied the age of initiation of alcohol consumption. The situation in that period was that drinking rates were somewhat lower for Ireland, and the initiation age was somewhat later. A more recent survey by O'Connor and Daly (1983) found that about 20 per cent of adults have never drunk alcohol. In general though, reliable information on the proportions of drinkers in the populations is difficult to obtain.

Kennedy, Walsh and Ebrill (1973) returned to the task of trying to estimate econometric demand equations for alcohol consumption. They worked with a longer time series, from 1949 to 1969, and also supplemented the price and income variables with other possible explanatory factors, including measures of employment, dependency ratios and demographic variables. The results, however, were not too different from those obtained by Walsh and Walsh except that a statistically significant own price elasticity for spirits of about -0.9 was obtained. The corresponding price elasticity for beer was not detected as significant. Again, a much higher income elasticity (1.3 to 1.7) was found for spirits than for beer (.5 to 1.1). They deducted that with future increases of income, consumption of spirits would increase more rapidly than that of beer.

Several researchers estimated income or price elasticities for alcohol as a whole in subsequent years, but only as a component of broad studies of consumption of a range of commodities. The authors included O'Riordan (1975), McCarthy (1977) and Conniffe and Hegarty (1980), all of who employed systems of demand equations, but without disaggregating alcohol into its component drinks. All found income elasticities in the range 1.2 to 1.6 that were statistically significant, but price elasticities were much more poorly determined, being small and negative. These results are quite compatible with the findings from single equation methods for the component drinks of larger, though still inelastic, price elasticities, since cross-price elasticities could reduce the overall alcohol elasticity. The next study specially devoted to alcohol consumption and containing elasticity estimates was that of Walsh (1980), which quoted income elasticities of 1.1 and 1.4 for beer and spirits respectively and corresponding price elasticities of -0.3 and -0.6.

Walsh's income elasticity for beer was notably higher than previous studies disaggregating the components of alcohol had suggested. The magnitude of the spirits' price elasticity was also notably lower than that of Kennedy, Walsh and Ebrill (1973). Walsh (1980) had updated his data set to include 1977 and so the possibility of genuine changes in elasticities, perhaps consequent on behavioural

changes, needs to be borne in mind. Thom (1984) estimated a model based on the Almost Ideal Demand System, which like other systems approaches takes explicit account of interrelationships between alcohol and other goods. His results were incompatible with other researchers in that he found considerably higher elasticities for spirits and wine. It could be argued that a systems approach ought to be more efficient than single equation approaches, assuming perfect specification and absence of data problems, but this should be manifested by lower standard errors for coefficients and not by very different elasticity estimates. The occurrence of such large differences suggests an erroneous model according to the Hausman (1978) specification test.

Household Budget Surveys can also yield estimates of income elasticities, but not of price elasticities, since the surveys are conducted over short time periods during which prices may be taken as constant. There are various technical reasons why elasticities derived from budget surveys need not be precisely the same as those obtained from time series and these will be mentioned later. However, they ought not to be too different. Most researchers analysing the Household Budget Surveys were not specifically interested in alcohol but treated it as just one of several commodities. Usually only an overall income elasticity for alcohol rather than disaggregated estimates for beer and spirits was presented in these studies.

Leser (1964) analysed the data from the 1951/52 Household Budget Inquiry, but unfortunately he categorised tobacco and alcohol together obtaining a joint income elasticity below unity. Since other studies have shown tobacco to have an income elasticity well below unity or even negative, the alcohol elasticity can be deduced to have been larger, but its magnitude is unclear. Pratschke (1969) looked at the 1965/66 Household Budget Survey and obtained an alcohol income elasticity of 1.79. Murphy (1976) examined the 1973 survey and found an elasticity of 1.19. This seems a considerable fall since 1965/66, however the earlier survey was conducted in urban areas only while the 1973 survey was country-wide. When Murphy split his data he found a lower elasticity for rural than for urban areas. Conniffe and Keogh (1988) obtained an elasticity estimate of 1.16, very similar to Murphy's, based on the 1980 Household Budget Survey.

The findings of this set of studies reviewed may appear diverse, but a fair degree of agreement emerges, with the exception of Thom (1984). Income elasticities for alcohol were generally found to be greater than unity, so that further income growth implies even greater shares of expenditure being devoted to alcohol. Total alcohol and beer consumption are definitely price inelastic, although the elasticity for spirits is nearer unity in magnitude. This implies that price increases do not decrease overall consumption to anything like the proportion of the price increase itself, so large price increases would be needed to greatly reduce overall consumption. Of course, the continued truth of these statements depends on whether the current elasticities are unchanged and that will be investigated in the next section.

There are many elasticity estimates reported in the alcohol literature for other countries, for example, Duffy (1983, 1987) for the UK, but these are obviously of doubtful relevance for Ireland. However, the general pattern is that overall alcohol consumption is income elastic and price inelastic; beer has the lowest income and

price elasticities, while spirits and wine have higher elasticities. It may be worthwhile mentioning that analysis of the UK Family Expenditure Survey, the counterpart of the Irish Household Budget Survey, can, at least in theory, yield far more information than is obtainable in Ireland. The reasons are that in the UK the survey is on an annual basis compared to every 7 years in Ireland and that in the UK researchers are allowed access to the data at individual household level. The Irish CSO guarantees confidentiality to the householder and does not release individual level data, but only averages over groups of households. So UK analyses can estimate price elasticities as well as income ones and the access to individual household data permits many other factors to be taken into account. However, there seem to be corresponding complications. A study by Atkinson *et al.* (1990) obtained income elasticities of much the same magnitude as found in Ireland, but also got high price elasticities. The authors were most reluctant to extrapolate these to the population as a whole, citing non-response problems and other issues. So perhaps the relative advantages of the UK survey are not as great as would appear.

3.3: *The Patterns from Historic Consumption and Prices*

The reports of the Revenue Commissioners provide data on quantities of beer, spirits and wine consumed in Ireland over the years. The data, converted to litres of pure alcohol and divided by size of adult population, are shown in Table 3.1 for the years 1960 to 1991. Adult population in this case is taken to be persons aged 15 and over, this convention is adopted primarily because of the format in which age cohorts are presented in the census. This probably remains a representative population of alcohol consumers given the survey evidence on the high incidence of alcohol use among Irish second-level school children (Johnson *et al.*, 1990), even though the minimum legal drinking age is 18 years.

The consumption of alcohol in the form of beer rose steadily from 1960 to 1974, then stabilised until 1977, before peaking in 1979. Beer consumption per adult steadily declined thereafter up to 1987 when it began to steadily rise again. Beer consumption as a share of total alcohol consumption was about 62 per cent in 1991, having declined from a high of 73 per cent in 1960, but risen from a low of 59 per cent in 1978. The consumption of spirits rose fairly steadily until 1978 and then declined until 1983, but has increased slightly since then. Spirits consumption as a share of total alcohol consumption was about 26 per cent in 1991, close to its 1960 share of 24 per cent but substantially down on its 1978 high of 34 per cent. In the case of wine, where quantities were much smaller to begin with, consumption rose steadily with some faltering in the 1979-1982 period. Its share of total alcohol increased from about 4 per cent in 1960 to 8 per cent by 1991. Cider consumption including perry, has increased threefold since the mid-1970s, its share of total alcohol while still relatively small, is increasing.

The Revenue Commissioners data in Table 3.1 are not actually used in our analyses to investigate how consumption is affected by prices and incomes. Instead, the CSO quantity and price data on personal consumption of total alcohol and its component drinks were used. The CSO make use of the Revenue data in preparing their series, but make modifications, such as the subtraction of business

Table 3.1: *Consumption of Beer, Spirits, Wine and Cider per Head of Population Aged 15 and Over in Litres of Pure Alcohol*

Year	*Beer*	*Spirits*	*Wine*	*Cider*	*Total*
1960	3.50	1.14	0.17	0.07	4.88
1961	3.73	1.37	0.19	0.07	5.36
1962	3.74	1.30	0.19	0.07	5.30
1963	3.84	1.38	0.21	0.07	5.50
1964	3.97	1.50	0.24	0.07	5.78
1965	4.01	1.54	0.25	0.07	5.87
1966	4.03	1.52	0.26	0.08	5.89
1967	4.10	1.54	0.29	0.08	6.01
1968	4.27	1.71	0.31	0.08	6.37
1969	4.58	1.91	0.32	0.10	6.91
1970	4.75	2.05	0.35	0.11	7.26
1971	5.04	2.18	0.36	0.10	7.68
1972	5.30	2.41	0.40	0.09	8.20
1973	5.64	2.72	0.44	0.08	8.88
1974	5.82	2.90	0.47	0.09	9.28
1975	5.77	2.89	0.47	0.09	9.22
1976	5.55	2.81	0.51	0.12	8.99
1977	5.58	2.97	0.54	0.11	9.20
1978	5.75	3.33	0.60	0.10	9.78
1979	6.01	3.23	0.66	0.07	9.97
1980	5.87	2.95	0.64	0.10	9.56
1981	5.57	2.69	0.65	0.11	9.02
1982	5.66	2.36	0.61	0.15	8.78
1983	5.26	2.00	0.56	0.15	7.97
1984	5.21	2.13	0.59	0.20	8.13
1985	5.26	2.49	0.62	0.19	8.56
1986	5.20	2.36	0.62	0.22	8.40
1987	5.06	2.21	0.62	0.23	8.12
1988	5.17	2.34	0.68	0.23	8.42
1989	5.43	2.28	0.71	0.23	8.65
1990	5.67	2.33	0.76	0.27	9.03
1991	5.66	2.35	0.77	0.34	9.12

Sources: CSO *Statistical Abstract*, various issues,
Revenue Commissioners *Annual Report*, various years.

consumption of alcohol. This may seem strange if thinking about the physiological impacts of alcohol, since effects on the individual do not depend on whether he, or she, spends their own money on drink, or obtains it at a business lunch or reception. However, prices will only matter to a consumer if they have to be paid, and so including business consumption could slightly distort the estimation of price response. A provisional forecast for personal expenditure on alcohol in Ireland for 1991 is IR£1.76 billion, which is closer to IR£2 billion when business expenditure is included.

The CSO quantity measures are essentially expenditures at constant 1985 prices. The price series are based on ratios of expenditures at current prices to expenditure at constant prices. The econometric analyses in this paper are based on data covering the years 1960-1987. Some qualifications about the data are required; in periods when prices differed substantially on the two sides of the Irish border there were quite large purchases made in one jurisdiction that were then consumed in the other. In the early 1980s, for example, spirits were considerably cheaper in Northern Ireland and so some of the decrease observable in Table 3.1 was just a purchasing decrease. Thus there was unrecorded consumption of alcohol that was originally purchased north of the border. It is possible to get some indicators of the scale of the problem and this matter will be returned to subsequently. It is also true that consumption in Ireland includes consumption by tourists and excludes consumption by Irish people on holidays abroad. Overall, the data suffer from some unavoidable limitations and so there will be some uncertainty about estimates of elasticities.

Figure 3.1: *Alcohol Consumption per Adult*

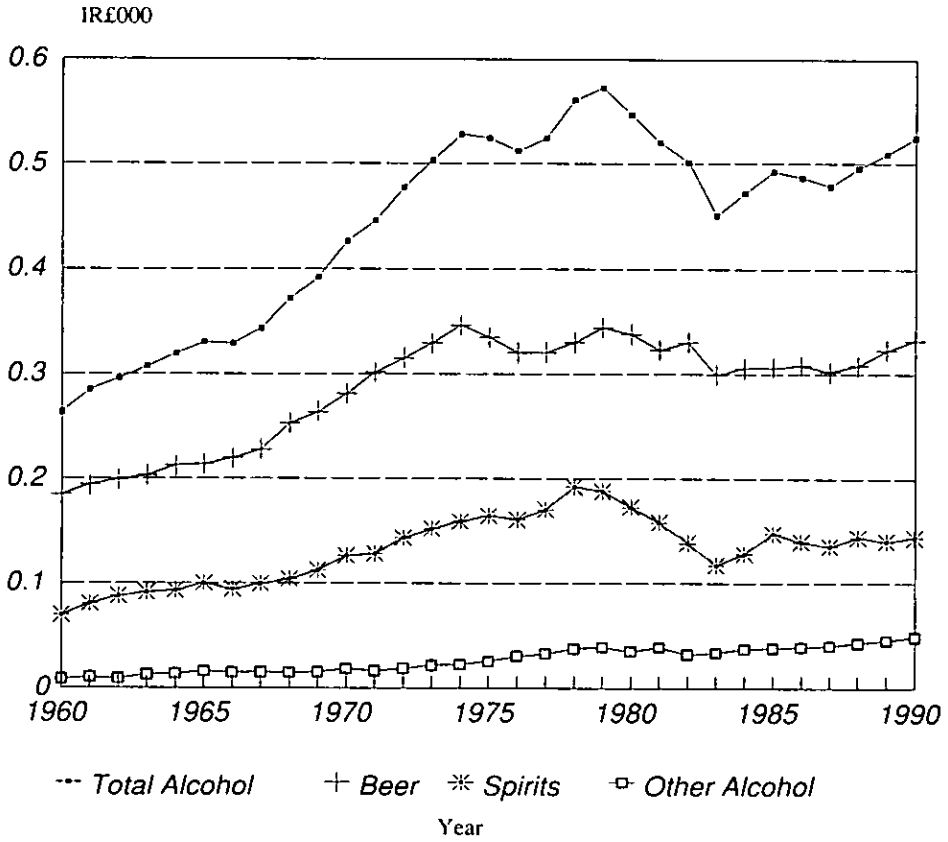


Figure 3.1 shows the quantities, calculated as just described, but divided by the population aged 15 or over for total alcohol and its component parts, beer, spirits and other alcohol. The other alcohol category includes wine, cider and perry.

The most striking feature of the total alcohol measure is the decrease in consumption from 1979 to 1983, after relatively steady growth over the previous two decades. Visual observation would suggest that a substantial decline in spirits consumption in this period could explain a significant proportion of the total decline. If this decrease cannot be fully explained by price and income movements then other factors such as cross-border smuggling must be considered.

Figure 3.2: *Real Prices of Alcohol.*

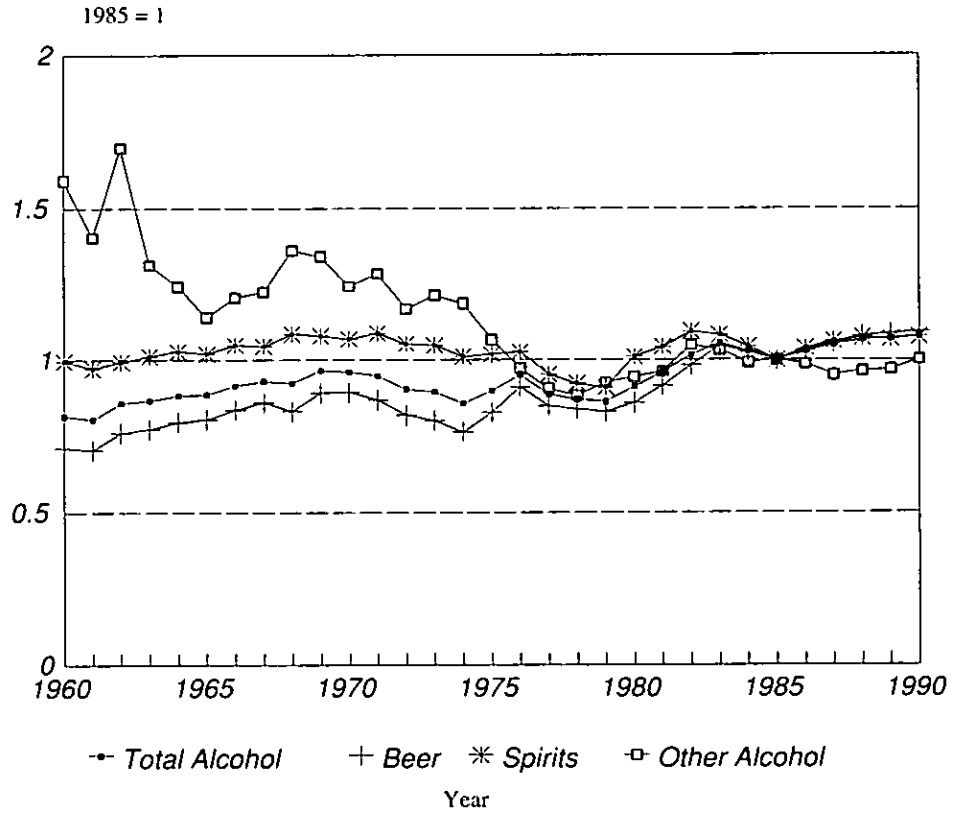
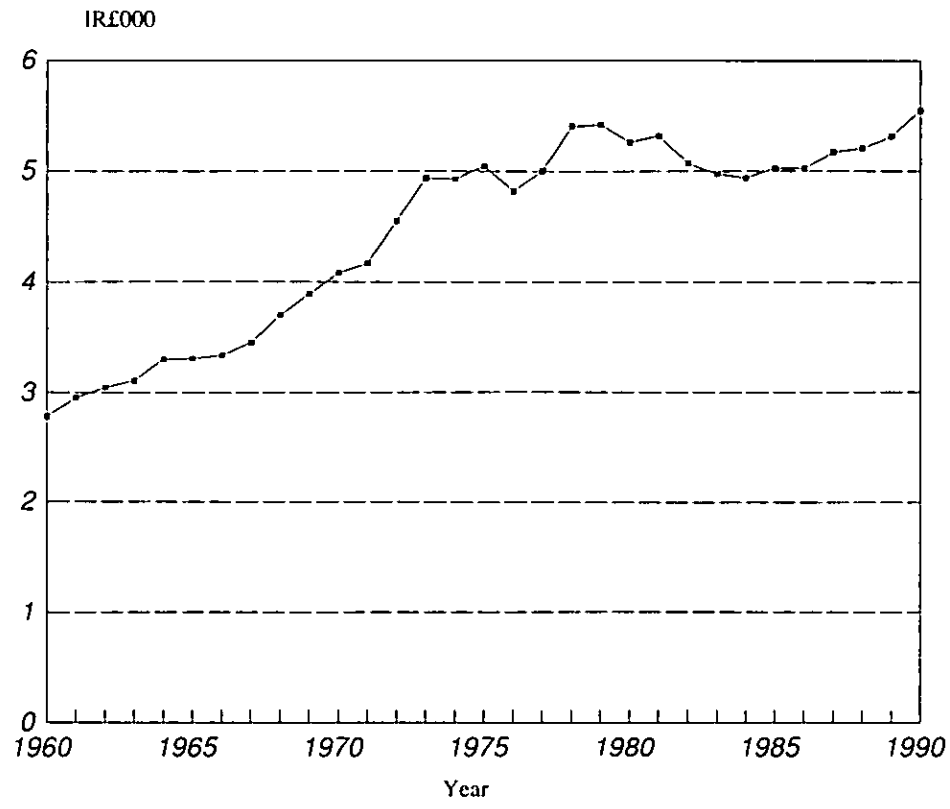


Figure 3.2 shows the evolution of prices for aggregate alcohol and its component parts. The prices are "real" in the sense that they have been deflated to correct for inflation and are expressed as an index with 1985 as the base. In real terms aggregate alcohol price increased by a little over 30 per cent between 1960 and 1990. The price of alcohol was rising steeply from 1979 to 1982.

Figure 3.3 shows real, that is adjusted for inflation, disposable income per adult. Real disposable income per adult almost doubled between 1960 and 1990. However, it fell between 1979 and 1983 which were years of considerable economic difficulty. So the drop in consumption of alcohol was accompanied by price rises and a fall in disposable income, which is what would be logically expected. Similarly the figures show that in the period from 1970 to 1974, real prices were falling and incomes rising, and alcohol consumption per head was rising steeply. The drop in income per head in the 1974-75 period and the simultaneous price rise again correspond to a drop in consumption. So in spite of possible data deficiencies plausible estimates of price and income effects seem feasible.

Figure 3.3: *Real Disposable Income per Adult*



It could be claimed that working in terms of total alcohol and an aggregate weighted price is a little artificial in that consumers actually consume beer, spirits and other alcoholic drinks and perceive separate prices for them. An analysis of the component drinks, relating quantity of each to its own price, as well as to the prices of the competing drinks and to income per head, could be argued to be more realistic since it permits substitution between drinks in response to price changes. A rise in

price of spirits would be expected to lead to a decrease in its consumption, partly through a switch to beer, so that beer and spirits behave as substitutes. While this seems plausible it should be said that consumption of two commodities could fall together following a price rise of one, if the commodities are considered to be complements. This is mentioned here because an instance will arise later.

The deflated price of beer rose by more than overall alcohol prices between 1960 and 1990. Real price of beer rose during the 1960s, fell during the first half of the 1970s and oscillated for the remainder of that decade before rising steeply in the early 1980s. The behaviour of beer consumption as shown in Figure 3.1 can be at least partially explained by the income developments and these beer price changes. Real prices were rising in the 1960s but real incomes were rising faster and, given that the income effects have been found to be of larger magnitudes than price effects, beer consumption increased. In the 1970s real beer prices were falling slightly, adding to the growth of consumption. But in the 1980s prices rose and incomes even fell for a period, which is quite compatible with the cessation of growth in beer consumption. Quantification of effects allowing for substitution with spirits will require the more technical analysis given in the next section.

In discussing spirits consumption the issue of cross-border purchases becomes specially relevant. Most beer is consumed in public houses is in draught form and it is also the case that bottled, or canned, beer is rather bulky and therefore costly to transport relative to its value. So there is a captive market for beer, to at least some degree. Spirits, which have a higher value per unit volume, are more likely to originate outside the jurisdiction when relative prices differ greatly, at least so far as home consumed spirits are concerned. There is no doubt about the reality of this effect.

Fitz Gerald, Quinn, Whelan and Williams (1988) analysed cross-border shopping in 1986, through specifically conducted surveys, and estimated that 12 per cent of the Republic's households had shopped in the North in the second half of 1986, which was a total of 835,000 shopping trips. In addition these authors found evidence of considerable commercial smuggling of certain consumer goods, particularly spirits. They estimated that in certain years, when the combination of excise duty differences and exchange rate values were particularly conducive to lower cross-border prices, approximately a quarter of spirits by volume drunk in the Republic were likely to have originated in Northern Ireland. Indeed, at least part of the motivation for the decreases in excise duties on spirits that occurred in the Republic in the late 1980s originated in an effort to reduce the incentive for this illegal trade.

The incentive has not always been in the same direction. Until about 1973 the prices in the Republic were lower than north of the border and so recorded spirits consumption here has been too high to some extent. Since 1973 the price has generally been lower in Northern Ireland but the size of the discrepancy has varied. It was much higher on average in the 1980s than in the 1970s. Thus the CSO data on spirits' consumption understates true consumption by varying degrees over the post-1973 period. This understatement is likely to be much more serious than the overstatement pre-1973 because the population of the Republic of Ireland is much

larger than that of Northern Ireland and the price differentials were greater in magnitude post-1973. The graph of recorded spirits consumption in Figure 3.1 is probably inaccurate for the reasons just given.

Recorded consumption of spirits per head increased more or less steadily from 1960 to 1977 and then declined up to 1985 and has fluctuated since. There was a fall in disposable income in the early 1980s which depressed spirits' consumption, just as it did beer consumption, However, the fall in spirits consumption from 1979 was much more severe than for beer. Real spirits' prices changed by much less than did beer prices over the whole period. In fact, in real terms spirits' prices were at their lowest in the years 1978-79, which undoubtedly contributed to the peak in consumption observable in Figure 3.1. Some of the subsequent fall in recorded consumption must also be due to the post-1979 price rises. However, a considerable proportion of this is also the cross-border effect. The econometric analysis of spirts' consumption in the next section will be complicated by the need to take account of this.

The "other alcohol" category (made up of wine, cider and perry) has increased constantly over the period and continues to do so. Changing tastes, particularly towards wine, probably have a lot to do with this growth, as have factors associated with our membership of the European Community. However, economic factors certainly play a part also. Figure 3.2 shows that real price of other alcohol has declined almost continuously, apart from a slight rise in the early 1980s. Indeed real prices in the late 1970s were only half the levels of the early 1960s, which is not unrelated to full Irish entry to the European Community in 1973.

3.4: *Estimates of Alcohol Income and Price Elasticities*

Commencing with total alcohol, several different functional forms were investigated for the relationship between quantity, income and price. However, the familiar double-log, or constant elasticity, form was found to be at least as appropriate as any of the usually considered functional forms, in terms of the various measures of goodness-of-fit and specification tests on residuals. This is not to imply that criteria suggested a total absence of problems, as will be discussed later. Regression coefficients, t values and some criteria of adequacy of the relationship are shown in Table 3.2.

Table 3.2: *Regression Analysis Results for Total Alcohol per Adult*

	Coefficient	*t value*	R^2	*D-W*	*Runs Test*
Income	1.13	28.3			
			0.97	0.83	-1.52
Price	-0.45	-3.8			

So the income and price elasticities were estimated at 1.13 and -0.45 respectively, which accords with the findings in the literature about overall alcohol consumption. At first sight, the model seemed to fit well, both coefficients being statistically highly significant and the R^2 value high. However, inspection of a plot of residuals showed some deviation from a "white noise" pattern with some tendency for the model to overstate recorded consumption (that is to produce too many negative residuals) in the 1980s. A Durbin-Watson (D-W) test was statistically significant and a runs test criterion, although not significant, gave a large value. Substitution of other reasonably simple models did not remove these symptoms. No doubt some model, perhaps incorporating varying parameters, could be found to pass specification tests and so give a statistically good fit, even if it made no economic sense. However, a more plausible explanation is as follows: since total alcohol contains spirits' consumption, which is understated in the recorded data for the 1980s because of the cross-border effect, it is quite possible that this is the root of the problem. A better assessment will be possible after considering the estimation of elasticities for the component drinks.

The regression analyses for beer consumption included the prices of spirits and other alcohol as well as beer price to permit the possibility of substitution effects and the estimation of cross-price elasticities. The results are shown in Table 3.3.

Table 3.3: *Regression Analysis Results for Beer Consumption per Adult.*

	Coefficient	*t value*	R^2	*D-W*	*Runs Test*
Income	1.11	18.5			
Beer Price	-0.48	-4.3			
			0.98	1.40	-0.70
Spirits Price	0.68	3.2			
Other Alcohol Price	0.07	0.7			

The income elasticity was 1.11, close to that for total alcohol, which is not necessarily any surprise since beer comprises most of total alcohol consumption, being two-thirds of the total. The own price elasticity was -0.48, confirming price inelasticity, but the cross-price elasticity with spirits price was almost 0.7, showing that an increase in spirits price of 1 per cent would lead, assuming beer prices unchanged, to an increase of about 0.7 per cent in beer consumption. Conversely a fall in spirits' prices would lead to a corresponding decrease in beer consumption. In fact, referring back to the figures of the last section, spirits' prices relative to beer were falling in the early 1980s, giving another reason for the drop in beer consumption. The coefficient for other alcohol price was small and not significantly different from zero suggesting that beer drinkers will not respond to a fall in wine prices by substituting wine for beer.

The relationship was generally well behaved with the income, beer price and spirits' price coefficients highly significant and a high R^2. Visual inspection of a plot of residuals did not indicate anything odd, the D-W value was in the indeterminate region and the runs test value was small. Since the coefficient on other alcohol price was so close to zero it seemed appropriate to re-run the model without this variable. This led to adjusted income, own price and spirits' cross-price elasticities of 1.08, -0.52 and 0.77 respectively.

Table 3.4: *Regression Analysis Results for Spirits' Consumption per Adult, 1960-1987*

	Coefficient	*t value*	R^2	*D-W*	*Runs Test*
Income	1.25	10.3			
Beer Price	-0.88	-3.9			
			0.94	0.98	-2.04
Spirits Price	0.003	0.007			
Other Alcohol Price	-0.28	-1.48			

As might be expected the estimation of the spirits equation led to less satisfactory results. The results using the full data period 1960-1987 are shown in Table 3.4. The income elasticity is not unreasonable at 1.25, a statistically significant result, but the price elasticities do not make sense. The coefficient on beer price is statistically significant, but negative, as if a rise in beer price led to a reduction in spirits' consumption, rather than an increase. The coefficient on spirits' price is almost zero instead of the significantly negative value that would be expected. An inspection of residuals showed a clear deviation from a random pattern, with recorded spirits' consumption in the 1980s falling below the values predicted by the model. Both the D-W test and the runs test gave significant values.

As was explained in the previous section, spirits' prices in the Republic were generally lower than in Northern Ireland until 1973 and, for the reasons stated there, one would not expect as much of a cross-border flow as occurred in the reverse direction after 1973. So the data were broken into 1960 to 1973 and 1974 to 1987 and separate analyses conducted.

The results for the earlier period, 1960-1973, are shown in Table 3.5. The results are much more statistically well behaved and economically plausible. The coefficients relating to income, beer price and own price are both statistically significant and of the expected signs. The graph of residuals looked compatible with the usual regression assumptions and the D-W and runs tests were not statistically significant. Omitting the other alcohol price variable from the model, as seems reasonable given its small coefficient and non-significance, reduced the income and increased the beer price coefficients marginally to 1.2 and 0.76 but left the spirits' price coefficient unchanged. An own price elasticity of -1.65 for spirits is larger in magnitude than those reported in the literature reviewed in Section 3.2,

with the exception of Thom (1984), and it is probably somewhat overstated. The reason would be that a spirits' price rise pre-1974 would not only have reduced demand in the Republic, but also reduced some of the incentive to smuggle spirits to Northern Ireland.

Table 3.5: *Regression Analysis Results for Spirits Consumption per Adult, 1960-1973*

	Coefficient	*t value*	R^2	*D-W*	*Runs Test*
Income	1.31	15.0			
Beer Price	0.72	2.3			
			0.98	1.92	0.65
Spirits Price	-1.65	-2.3			
Other Alcohol Price	-0.07	-0.7			

As might be expected, a corresponding analysis for the 1974-1987 period, led to quite different results. Neither the own price coefficient for spirits nor the income coefficient were statistically significantly different from zero, while the beer price was apparently highly significant with the wrong sign, -1.05 with a t value of -5.1. Clearly the defective consumption data during this period lead to very distorted estimates. The problem affected the analysis of the whole period 1960 to 1987 too, of course, and even fed into the total alcohol relationship as has already been mentioned. However, since beer consumption is much greater than spirits' consumption, the distorting effects on elasticities were much less noticeable and were only detected in terms of non-random residual patterns.

Exports of spirits from the Republic to Northern Ireland increased dramatically during the periods when the discrepancy between prices North and South was greatest, and it seems very plausible that most of these "exports" were re-imported illegally. So it is possible to estimate adjustments to spirits' consumption in the Republic using observed increases in exports to Northern Ireland. This was one of two methods of adjustment employed in Fitz Gerald *et al.*. It is tempting to relate these corrected figures to income and prices, but there are strong limitations to the interpretation of results. First, the adjustments are only estimates based on an investigation containing its own sources of inaccuracies and dependent on assumptions made about consumption in Northern Ireland. Second, even if consumption figures were now correct, the prices they are being related to are incorrect, because the cross-border spirits were not purchased at the Republic price. Nor could a new price be calculated as a weighted average of Republic and Northern Ireland prices, because a shopping tripper incurs travel costs, while an actual smuggler presumably wants a profit. Really all than can be known is that the true price is somewhere below the Republic price.

Bearing these reservations in mind, the results of a re-run for the 1974-1987 period with corrected consumption data were that income elasticity rose to a statistically just significant value of 0.71, the estimated own price elasticity became a highly statistically significant -1.08 and the previously wrongly signed (and statistically significant) beer price coefficient changed to the correct sign (though failing to attain significance). So correcting the consumption data, crude and inadequate though the process is, does move the estimates in the direction of those obtained for the 1960-1973 period.

Income elasticities can also be estimated from cross-sectional data. Although this is properly a topic for the next chapter, where the Household Budget Survey data will be described and analysed, some results will be given at this point to supplement the time series findings on spirits. It could be argued that time series and survey estimates need not be estimating quite the same quantities, so it is best to first say that the 1987 Household Budget Survey gave an income elasticity for beer of 1.06, which compared very closely with the 1.08 value obtained from the satisfactory time series data. The income elasticity for spirits was estimated at 1.22 which may be compared with the 1.31 figure obtained from the analysis of the pre-1973 period and the 0.71 figure from the analysis of the corrected post-1974 period. An analysis of the 1980 Household Budget Survey gave an income elasticity of spirits of 1.20. So, from household evidence, it would seem the elasticity had not declined during the 1980s. This suggests that it is the 0.71 figure that remains an underestimate due to the still imperfect data for the past-1974 period. So an income elasticity of 1.2 will be taken as the best estimate for spirits' consumption.

Household budget data cannot reveal price elasticities since prices were more or less constant during the survey, so the spirits price elasticity must still be decided upon. The figure obtained from the time series for the 1960-1973 period was probably too large in magnitude, but given that the cross-price elasticity of beer to spirits (and of spirits to beer in 1960-1973) was about 0.8 it is plausible that the own price elasticity should be numerically somewhat larger. The corrected 1974-1987 data gave a magnitude of just over unity and previous studies had obtained similar values. Overall a spirits price elasticity of -1.0 represents a "best guess".

Turning to other alcohol, which is largely wine, the results of a regression analysis are given in Table 3.6.

Table 3.6: *Regression Analysis Results for Other Alcohol Consumption per Adult*

	Coefficient	*t value*	R^2	*D-W*	*Runs Test*
Income	1.02	9.7			
Beer Price	1.28	6.6			
			0.99	1.5	-0.38
Spirits Price	-1.30	-3.5			
Other Alcohol Price	-1.05	-6.5			

The equation was generally adequately determined with no observable patterns in residuals, and insignificant D-W and runs test values. All four coefficients were statistically highly significant, including the two cross-price coefficients. The high positive cross-price elasticity on beer showed beer to be substitutable for wine, but the equally high cross-price elasticity on spirits was negative suggesting wine and spirits are complements. The previous analyses of beer and spirits had failed to find significant coefficients on other alcohol price and indeed the estimated coefficients were close to zero. There is not necessarily any contradiction here. Remembering that even in 1987 alcohol consumption in the form of beer was about six times greater than that of other alcohol, the asymmetry with beer is easy to understand. Many beer drinkers are presumably habitually attached and will not substitute wine or cider for beer even if it becomes relatively cheaper, but a considerable proportion of wine drinkers may substitute beer if price rates move the other way.

The complementarity with spirits prices is less easy to explain. The lack of a cross-elasticity of spirit consumption on wine prices could be explained again by remarking that alcohol consumption in spirits form was still four times that of wine and supposing that most spirits drinkers will substitute only with beer, if at all. Alternatively the problems with the spirits data in the more recent period, when wine drinking was also becoming more popular, may be cloaking effects. But in the case of wine consumption the significant complementarity must mean that a substantial number of wine purchasers also habitually buy spirits, so that a drop in spirit prices leads to increased purchases of both wine and spirits.

Before concluding this section some remarks on our econometric estimation of elasticities are relevant. The model employed has related consumption to income and price in a relatively simple manner and ignored many possible refinements. Other goods compete with alcohol for the consumer's spending and although the analyses have implicitly taken account of this by appropriate deflation of drinks prices, a more efficient treatment would be possible through system estimation. However, we feel the data defects, discussed earlier, make sophisticated analyses of component drinks rather unproductive. Even in a single equation framework, equations could be made dynamic by lagging price and income effects and introducing lagged consumption to proxy partial adjustment effects. Many of these issues are discussed in Godfrey (1989) and indeed there is one school of econometrics that favours commencing with rather general models and testing them down. However, it is not the only school, nor is it the globally dominant one. In the alcohol case and using annual data, lagged income and price effects do not seem particularly plausible, given that drinking can be a daily activity. Certainly, Duffy (1983) found no improvement from introducing dynamic effects.

A more worrying aspect is the omission of variables that matter; advertising, for example. Data access is the key difficulty but the approach to incorporating such variables can also be far from straightforward. For instance, advertising expenditure is almost certainly endogenous, depending on volume of sales, and would require simultaneous equation modelling. In general, the whole field of alcohol studies suffers from data deficiencies, although consumption elasticities are not the worst case given that some estimates are possible.

3.5: *International Comparisons of Consumption and Expenditure*

Table 3.7 shows alcohol consumption per head in a selection of countries in 1987. Note that it is not per adult, so explaining the differences in the figures for Ireland in this table and in Table 3.1. Clearly intake of alcohol per head is relatively low and ranks among the lowest in Europe. France and Spain are two of the three highest, while Italy and the UK occupy intermediate positions. Admittedly, the cross-border flow of spirits may be understating that component somewhat, but it would not change the ranking in the international league table.

Table 3.7: *International Alcohol Consumption per Head of Population in Litres of Pure Alcohol (1989)*

	France	*Spain*	*Italy*	*United Kingdom*	*Ireland*
Beer	1.6	2.7	0.9	4.1	3.6
Spirits	2.3	3.0	0.9	1.7	1.5
Wine	9.3	6.8	8.3	1.5	0.4
Total	13.2	12.5	10.0	7.3	5.5

Source: World Drink Trends (1990).

It has already been mentioned in the Section 3.1 that the treatment of alcohol expenditure in Irish national accounts is different from that used in other European countries. The effect of this, if superficial comparisons of countries are made, is to create an illusion that the Irish spend an exceptionally higher proportion of their incomes on alcohol than do citizens of other European countries. For example, Table 3.8 gives an extract from United Nations' national accounts data. Sweden is chosen instead of Spain in this table, first, because expenditure data for Spain was not quoted and, second, because Sweden, like Ireland, has high excise taxes on alcohol.

Table 3.8: *International Expenditure on Alcohol as a Percentage of Total Personal Expenditure on Goods and Services*

Year	*France*	*Ireland*	*Italy*	*Spain*	*Sweden*	*United Kingdom*
1980	2.3	10.3	1.6	1.3	4.0	1.8
1983	2.1	10.3	1.5	1.3	3.7	1.9
1986	2.1	10.2	1.3	1.3	3.4	1.9

Source: United Nations *National Account Statistics*, (1989) New York.

Although France had the highest alcohol consumption per head, its expenditure as a proportion of total expenditure seems far less than Ireland's. Excise taxes are high in Ireland by international standards (see Table 6.4), but this is not sufficient

to explain such dramatic differences. Sweden has high prices and taxes on alcohol, with per capita alcohol consumption of similar magnitude to Ireland, yet the proportion of total expenditure spent on alcohol is shown as one-third of Ireland's.

The comparison is even more misleading as stated in the EUROSTAT (1987) purchasing power parity and GDP accounts. This is because these accounts derive quantities by dividing expenditures by prices, rather than deriving prices by dividing expenditure by quantities. The 1985 figures for a sample of countries are given in Table 3.9. These data show Ireland's volume of alcohol consumption as three times that of the UK and one and a half times that of France, which has the highest actual consumption in Europe. In these same accounts are figures which seem to indicate that citizens of the UK spend sixteen times as much per head in restaurants as do the Irish.

Table 3.9: *Per Capita Volume and Value Indices of Alcohol Consumption in the European Community*

	France	*Spain*	*Italy*	*United Kingdom*	*Ireland*
Per capita volume	161	69	72	73	219
Value indices	177	105	110	110	332

Source: EUROSTAT, *Purchasing Power Positions and Real GDP - Results 1985*, (1987), Luxembourg.

The explanation for these misleading figures is that in Ireland spending in pubs on alcohol is attributed totally to the category "alcohol" in the statistical national accounts. In most European countries only off-licence type sales are attributed to alcohol, while money spent on drink in bars or restaurants is attributed to such categories as recreation, restaurants or entertainment[1]. As with many other statistics, the UK and Ireland originally followed the same treatment of alcohol in the national accounts. The UK's Annual Abstract of Statistics still does so, but figures are also produced according to the European criterion.

Recalculating the Irish figures on the same basis as the European figures in Table 3.8 is not possible given the data available. However, it is possible to compare the UK figures calculated on the same basis as the Irish ones with those presented in Table 3.8. From the UK's Annual Abstract of Statistics (1990), the UK figures for 1980, 1983 and 1986 are 7.2, 7.1 and 6.9 respectively, nearly four times the values in Table 3.8. Making the crude assumption that a similar ratio would apply in the Irish situation would give an estimate of 2.5 per cent. This would be much more in line with European figures. Although this is a very tentative conclusion, it is quite certain that current international comparisons grossly overstate the place of alcohol in Irish consumer expenditure relative to other countries.

[1]We are indebted to Mick Lucey and Joe McNeil in the Central Statistics Office for clarifying this situation.

Returning briefly to the evolution of overall alcohol consumption over time, the pattern has been one of considerable growth from 1960 to 1979 followed by some decline. Even if the cross-border effects exaggerated the decline somewhat, this pattern remains valid and it mirrors developments in Europe and the USA. See, for example, Smart (1989), Van Iwaarden (1989) and Williams and DeBakey (1992). The international trends are largely explained in the literature by the same factors discussed in this chapter: changes in income and prices. However, other factors are mentioned too, including demographic effects, awareness of healthy lifestyles and the influences of mass tourism and advertising. Some of the findings of these studies will be returned to in later chapters to supplement, or in some cases substitute for, sparse Irish data on such topics.

The level and trends in alcohol consumption in Northern Ireland would be of particular interest for this study, but there are difficulties obtaining statistics separate from those for the UK. Davidson (1991) reported that per capita consumption in Northern Ireland is the same as for the UK, but a higher proportion of people are total abstainers from alcohol, so implying that those who do drink alcohol drink more. This finding seems a little inconsistent with the lower incomes in Northern Ireland, relative to Great Britain, given that alcohol consumption is income elastic.

3.6: *The Implications of Statistics and Elasticity Estimates*

Consumption per head is low in Ireland by the standard of the developed countries and expenditure per head is not at all exceptional by international comparisons. Perhaps then the very existence of an "alcohol problem" and the need for "alcohol control" can be questioned. If Ireland really needs to lower alcohol consumption levels what does this infer about the state of every other country in Europe? Kendell (1987) has argued strongly that a reduction in the UK level of alcohol consumption would be beneficial to the nation's health, but that the greatest realistic reduction would be to two-thirds of current consumption. Referring back to Table 3.7 shows that this would be close enough to the current Irish level.

Of course, there are individuals whose consumption is vastly greater than the average per head, but if the Ledermann (1956) hypothesis, to be discussed later in Chapter 6, is accepted, the frequency of such individuals should be smaller in countries with lower average intakes. If the Ledermann hypothesis is totally rejected, so that the average level is not really informative at all about the group of heavy drinkers, then perhaps policy measures (via prices, for example) that influence average consumption are not all that useful. However, that would assume that it is only heavy drinkers who suffer the ill effects from alcohol consumption and that is an assumption that at least deserves further discussion later on.

The elasticities estimated in Section 3.4, relate to average consumption and are important in assessing the effects of potential policy measures on that quantity. These are obviously of doubtful value if average consumption is quite irrelevant for the level of alcohol problems. On the supposition that average consumption is important, a matter we return to in Chapter 6, the elasticities summarised in Table 3.10 indicate some interesting points.

Table 3.10: *Income and Price Elasticities*

	Income	P_a	P_b	P_s	P_w
Total Alcohol	1.1	-0.4	NA	NA	NA
Beer	1.1	NA	-0.5	0.8	0.0
Spirits	1.2	NA	0.8	-1.0	0.0
Other Alcohol	1.6	NA	1.3	-1.3	-1.1

Notes: P_A = Average price; P_B = Beer price; P_S = Spirits price; P_W = Wine price; NA - Not applicable.

The price elasticity for total alcohol is -0.4, an inelastic value showing that overall consumption of alcoholic drink is not sensitive to price. But individual own price elasticities of spirits and wine are fairly sensitive. What happens if a price rises is that another drink will be substituted, unless its price has also risen. If the price of either spirits or wine rises, beer is substituted. If the price of beer rises spirits are substituted. But if all prices are raised simultaneously the scope for substitution cancels out and the overall drop in consumption is a lot less than the individual responses might suggest. The cross-price elasticities are substantial in magnitude and so suggest that pricing policies could encourage switching to lower alcohol drinks. In this regard it would have been very interesting to compare sales of low, medium and high alcohol beers, but the data are not disaggregatable to that extent.

The income elasticities for beer, spirits and total alcohol are relatively similar (the estimate for spirits was a compromise one) and greater than unity, indicating that increasing economic growth in Ireland will increase alcohol consumption more than proportionately if historic trends and tastes continue to operate. The income elasticity for wine is very high and this probably reflects a relatively recent upsurge in the popularity of that drink among the higher income groups. Some fashionable motivation may be reinforcing the true income effect. A glance back at Table 3.7 shows the gap between Ireland and other European countries so the possible scope for growth in wine consumption is considerable. Even as regards the UK, the main reason Irish total alcohol consumption is smaller lies in the much lower wine consumption. The apparent complementarity between wine and spirits (the negative cross-elasticity) may also be related to a non-economic taste or fashion factor. Wine consumption may be very important in determining future alcohol intake although its current market share is still relatively low.

These elasticities will be employed later when some of the limitations on pricing policies will be considered. The move towards harmonisation of tax and excise levels in the context of a single European market will have implications for the degree to which Ireland can pursue independent pricing policies to influence drinking patterns. None the less, these estimate of elasticities will be useful in assessing the potential effectiveness of pricing policies and the likely consequences of future income growth.

Chapter 4

EXPENDITURE BY HOUSEHOLDS ON ALCOHOL

4.1: *Introduction*

The aggregate annual data employed in the previous chapter for time series analyses cannot provide any information on differences that may exist among the drinking patterns of different types of households. However, the data from the Household Budget Survey can, to at least some degree, remedy this deficiency.

4.2: *The 1987 Household Budget Survey*

Household Budget Surveys are conducted at intervals of seven years and the most recent was that carried out in 1987. The results of this survey were published subsequently in two volumes (Central Statistics Office, 1989 and 1990). The survey involved 7,700 households and the recorded information related both to household characteristics and to the composition of weekly expenditure on commodities.

For the purposes of this study it was essential to disaggregate the "drink and tobacco" commodity in the Household Budget Survey, but the expenditures on commodities other than alcohol were not of particular interest. Expenditures on drink were required separately for various types of households as defined by such factors as location, family composition and socio-economic status. For each of these categories further breakdowns of the data by income classification were required in order to estimate income elasticities and compare the resulting estimates between categories.

Table 4.1: *Characteristics for Defining Groups of Households*

Characteristic	*Number of Levels*	*Nature of Levels*
Environment	2	Rural or urban
Location	8	The planning regions: East, South East, etc.
Household Size	6	Number of persons in household
Household Composition	9	Family composition in terms of adults and children
Socio-economic Status	6	Based on occupation of head of Household

Source: CSO *Household Budget Survey, 1987*, Volume 1.

The published volumes of survey results did provide some of the required data, but not to the level of detail needed for all analyses, and special tabulations were kindly provided by the CSO. Table 4.1 lists the characteristics of households that were employed to define different groups of household for which separate income elasticities were estimated. The results of the analyses of these groups will be outlined in Sections 4.4 to 4.8.

Since the prices of the various forms of alcohol are virtually constant over the one year period of a Household Budget Survey, it is impossible to estimate a demand equation for alcohol relating consumption to price and income. Of course, the prices of other commodities are virtually constant also. If the survey was repeated annually, as in the UK, a systems demand approach could be adopted. So far as price elasticities are concerned the time series estimates of the previous chapter remain all that are available. A survey of overall average expenditures on major commodities may be of interest and is given in Table 4.2.

Table 4.2: *Average Household Expenditures by Commodities (1987)*

Commodity	*Urban Households*	*Rural Farm Households*	*Other Rural Households*
	(IR£/week)		
Food	55.8	67.2	52.7
Alcoholic Drink	12.0	9.3	7.6
Tobacco	7.6	6.6	6.8
Clothing and Footwear	15.3	19.0	12.8
Fuel and Light	14.0	13.6	14.1
Housing	23.0	10.2	15.8
Household Non-Durables	4.9	4.0	4.2
Household Durables	9.1	9.0	7.9
Miscellaneous Goods	8.2	7.9	6.6
Transport Services	28.1	6.0	33.3
Other	55.4	38.8	37.4
Total Expenditure	233.3	221.4	199.2
Household Size	3.46	3.89	3.46

Source: CSO *Household Budget Survey, 1987*, Volume 1.

4.3: *Econometric Estimation from Household Budget Survey Data*

One important point about Household Budget Survey data is that stated income is often very different to a household's recorded total expenditure. This is very evident indeed as Table 4.3 shows. For urban households, expenditure in the lowest income group was four and a half times income and in the next two groups it was almost twice it. We have used the urban households to illustrate this point, not because the phenomenon is unique to them, but in the case of rural households, the

technical difficulties of defining and measuring farm incomes might be thought to provide an explanation for this discrepancy. One explanation for the discrepancy is that many households may have seen their 1987 income as temporarily falling below their long run, or "permanent", income and therefore being ready to spend out of savings or borrow against future increased income. This would suggest that total expenditure is a better measure of true, or permanent, income than is stated current income. Another explanation is just that respondents are understating incomes deliberately, perhaps in fear of information being transmitted to tax revenue authorities. Again though, it would seem the higher total expenditure figures are a more plausible measure of true income.

Table 4.3: *Gross Incomes and Mean Expenditures of Urban Households in the 1987 Household Budget Survey*

Gross Income	*Percentage of Sample*	*Mean Total Expenditure*
(IR£/week)	*(Per cent)*	*(IR£/week)*
<40	4.4	179
40-60	13.0	105
60-100	18.0	151
100-150	14.0	193
150-200	12.0	234
200-300	19.0	294
300-400	10.0	345
400-600	6.2	439
>600	1.7	506

Source: CSO *Household Budget Survey, 1987*, Volume 1.

So what will be termed income in subsequent analyses will actually be total household expenditure and income elasticities will really be total expenditure elasticities. Thus the explanatory variable in regressions of alcohol expenditure on income will actually contain alcohol expenditure as one of its components. Any disturbance or random impact associated with the dependent variable will also have an effect on the explanatory variable, so that instead of being exogenous it is subject to error. Some econometric complications follow from this in that the usual ordinary least squares formulae obtained by regressing alcohol on total expenditure using household values are inapplicable. One valid approach is to divide the households into groups by nominal income and to regress group means on each other. This approach, which is interpretable as an instrumental variable method, has a long history going back to Bartlett (1949). It was first applied to analysis of Irish Household Budget Survey data by Leser (1962) and subsequently by Pratschke (1969), Murphy (1976) and Conniffe and Keogh (1988). Simple though the method

is, it remains competitive, partly for practical reasons to be mentioned shortly and partly for theoretically interesting statistical reasons; see, for example, Farebrother (1991).

In conducting the Household Budget Survey, the CSO spread the work over a year, but only directly examine each household's expenditures for a fortnight. So, roughly, one-twelfth of all survey households are examined each month and there will obviously be very large seasonal effects in the case of alcohol expenditure, since households examined close to Christmas or other holidays are likely to show larger purchases of the commodity than households examined at other times of the year. When averages are taken over fairly large numbers of households seasonal effects should cancel out, provided the criterion defining the group is not itself correlated with season. Clearly, groups defined by, say, household composition and a stated annual income, ought to be satisfactory from this point of view. Eliminating seasonal effects in any other way could be very difficult, even if actual survey dates were available for households, given that the data do not extent beyond a year. Finally, a certain degree of grouping would have been imposed by the CSO in any event, because confidentiality is guarantied to responding households in the sense that individual household data are never revealed.

So analysis of grouped data is imposed by both statistical and practical considerations. It should be said too that even if all household data were available without any explanatory variable error problems, grouping data for analysis need not lose much information. Unless the models being fitted are truly enormous in terms of specified parameters, the set of means of a large number of groups must come close to constituting a set of sufficient statistics, at least if it is the parameters of a relationship that are of interest rather than some household level components of variance.

Another difficulty is that the Household Budget Survey is known to understate expenditure on alcohol, either because some respondents do not wish to admit their true drinking level, or because heavy drinkers may refuse to participate in the survey at all. Now understatement will not invalidate elasticity estimates provided all income groups understate in the same proportion. But if lower income groups understate more than higher income groups the income elasticity would be overestimated. On the other hand, if it is the higher income groups who are more likely to misrepresent their alcohol consumption, the elasticity will be underestimated. This is not a problem that can be overcome by devices of statistical analysis and has to be taken as a fundamental problem with the data. This problem is by no means unique to the Irish Household Budget Survey. Most UK survey data based on households or individuals encounter similar difficulties, especially if data are questionaire based; see, for example, Kendell (1987). Even medical specialists, treating patients with alcohol related conditions, have difficulty in obtaining accurate account of alcohol consumed; see, for example, Bird (1991).

The relationships between expenditures on commodities and total expenditure, often called Engel Curves in the literature on consumer demand, can take various functional forms. Three such forms that are commonly employed in the literature are the linear, semi-log and double-log, which are:

$$x = a + by$$
$$x = a + b \log y$$
$$\text{and } \log x = a + b \log y$$

respectively, where x represents expenditure on a commodity and y total expenditure, or income. The equations are compared in terms of the usual statistical criteria of goodness of fit, including R^2 and the standard error of estimate (bearing in mind the need to allow for transformation of a dependent variable) and randomness of residuals. The latter were assessed both by visual inspection of plots of residuals and by formal tests of the significance of coefficients of powers of the explanatory variable (x or $log\ x$) added to the equations. For a single explanatory variable these tests are equivalent to the RESET procedure (Ramsey, 1969) of relating residuals to powers of predicted values. Overall the double-log form was found to be superior in all the situations to be subsequently discussed. This has frequently been found previously in the literature when dealing with luxury commodities.

With a double-log form the income elasticity is equal to the coefficient b, since the elasticity is

$$\frac{y}{x} \cdot \frac{dx}{dy}.$$

When investigating a particular household characteristic and its interaction with income, the number of data points will be the product of the number of levels of the characteristic and the number of income groups. The latter will usually be 10, corresponding to income deciles so that for the investigation of say, socio-economic status, there will be 60 data points each being averaged over a number of households. With the size of survey, it might seem that more than 60 points would easily be compatible with keeping group numbers large enough to average over seasonal effects. But certain levels of characteristics and income levels may not be all that frequent to start with, so that going beyond deciles for income groups can lead to problems.

Four situations can arise in the analysis of a household characteristic and income, although one of these is rather implausible. First, the same relationship may hold at all levels of the characteristic so that

$$\log x_i = a + b \log y_i$$

where the subscript i denotes level i.

Second, the coefficient b may be the same but the intercepts may differ so that

$$\log x_i = a_i + b \log y_i$$

In this case even if $y_i = y_j$, x_i and x_j would differ because

$$\log x_i - \log x_j = (a_i + a_j)$$

or

$$\frac{x_i}{x_j} = antilog\,(a_i + a_j)$$

In this case one group of households always drinks more than another group with the same income although the percentage increases in their spending on alcohol, given equal income increases, are the same.

The third case is where both coefficients and intercepts differ between the household groups defined by the levels of the characteristics. Then the proportional responses to income increases will differ also. In the literature these cases are sometimes called "additive" and "interactive" models, depending on whether intercepts, or all parameters change. The latter case is

$$\log x_i = a_i + b_i \log y_i$$

The fourth situation is where the coefficients differ, but the intercepts do not, so that

$$\log x_i = a + b_i \log y_i$$

However, this is probably implausible in practice, since the model would represent a set of lines (in log terms) radiating out from a point.

Implementing models with different intercepts and coefficients corresponding to household characteristics is usually achieved by introducing dummy variables for the intercepts and multiplying these by the income variable to generate separate coefficients. The separate coefficients can be tested out to see if they differ, and if they do not, the equations can be re-estimated with the same coefficients, but different intercepts. These intercepts can then, in turn, be tested to see if they differ significantly.

The fact that certain levels of a household characteristic occur more frequently than others in the population implies that all means are not based on the same number of households. This suggests that an analysis with heteroscedastic variances might be more appropriate than the standard analysis assuming homogeneity of variance. If the disturbance term e_{ij} in the equation

$$\log x_{ij} = a_i + b_i \log y_{ij} + e_{ij}$$

where i refers to household characteristics and j to income category, is taken to have a variance of s^2/n_{ij}, then the correct analysis can be performed, since the n_{ij} are known. The usual difficulty to performing generalised least squares in specifying the variance matrix of disturbances is easily overcome. However, the actual results

turned out to be virtually identical to the analysis assuming homogeneity, both as regards coefficients and standard errors. This may partly be because the standard analysis gives unbiased estimates even in the case of heterogeneous variances, but may also be because s^2 may not be constant between groups and because the cancelling out of seasonal effects in the mean may be more important than reduction of random variation. A similar situation was found to hold for energy expenditures reported in the Household Budget Survey (Conniffe and Scott, 1990). So the results subsequently reported will be based on the standard analyses.

4.4: *Alcohol Elasticity Estimates for Households*

Since the main virtue of Household Budget Survey data is that it permits disaggregation by household characteristics, the estimates based on all households will be covered very briefly. The income elasticity for total alcohol was estimated as 1.14 which is very close to the time series estimate given in Chapter 3. The income elasticity for beer was computed as 1.06, which was again very close to the time series estimate. The agreement is encouraging because it suggests that the under-reporting of drinking, that is known to occur in the Household Budget Survey, is not biasing the elasticity estimation.

The spirits elasticity has already been mentioned in the previous chapter, where it was used to supplement the time series findings, which were deficient for the reasons already explained. The value obtained was 1.22 indicating the luxury good nature of the spirits commodity.

The Household Budget Survey data gave an income elasticity for other alcohol (mainly wine) consumption of 1.63 which is much higher than that shown by the time series data. But as was evident from the discussion in the previous chapter, wine consumption has been increasing in response to other factors besides prices and income. Large scale wine consumption is a modern phenomenon in Ireland and it has possibly not yet reached its stable share. Since the Household Budget Survey was conducted in 1987, corresponding to the very end of the time series data, the high income elasticity seems plausible. It is certainly hard to see why any more inaccurate reporting of consumption might occur for wine than for other forms of alcohol. Further clarification of what is happening will arise from the analyses that disaggregate households by various characteristics.

4.5: *Rural-Urban Differences in Alcohol Consumption*

The first characteristic to be considered is whether the household was located in a rural or urban area. The term "urban" includes quite small towns although most of the households are located in cities proper. Table 4.4 compares expenditures on alcohol between rural and urban households and also presents other relevant information. Expenditure on alcohol was IR£8.1 per household per week in rural areas as compared with IR£11.8 per week for urban areas. Consumptions of beer, spirits and wine (which will be used to name "other alcohol" from now on, although they are not exactly the same thing) for rural areas were 68, 84 and 40 per cent of the corresponding urban figures. But it should not yet be concluded that there is any tendency towards greater moderation in drinking in rural areas, because it has

already been found for the State that alcohol consumption is income elastic and rural incomes were lower than urban ones on average. Higher income groups are expected to show a proportionately greater expenditure on drink.

Table 4.4: *Rural and Urban Households' Comparisons (1987)*

	Rural	*Urban*
No. of Households in Survey	2,858	4,847
Average Total Expenditure (IR£/week)	205.8	233.3
Average Household Size	3.6	3.4
Average Beer Expenditure	6.1	8.9
Average Spirits Expenditure	1.6	1.9
Average Wine Expenditure	0.4	1.0
Total Alcohol Expenditure	8.1	11.8

Source: CSO *Household Budget Survey, 1987*, Volume 2.

The groups were then examined separately, in the sense of fitting different coefficients and intercepts in the manner described in Section 4.2. The findings are shown in Table 4.5. The income elasticities are lower for rural than for urban households for beer, spirits and wine. However, the difference is not statistically significant in the case of beer. (Note that the t tests in the table are not the usual tests of differences from zero, but tests of differences between coefficients.) The difference between intercepts is not statistically significant either, so it is reasonable to conclude that the same relationship holds between beer consumption and income in rural and urban areas. However, the differences in coefficients are statistically significant in the cases of spirits and wine. The income elasticities are definitely lower in rural areas. There is then no special meaning to testing for different intercepts, since the relationships certainly differ if the coefficients do.

The reasons for these differences may lie in social attitudes, but there are practical implications for possible programmes on alcohol. If the objective was to reduce alcohol consumption through educational advertising, say, it would make sense to place less emphasis on spirits and wine, and more on beer, in the local provincial press than in the urban or national media. It is also deducible from the detail of the survey data that a somewhat higher proportion of alcohol is consumed at home in urban areas and this is specially true of wine. This might be relevant in designing the content of programmes. Table 4.5 also shows the total alcohol coefficients and intercepts, which it will be noticed are close to the beer values, because beer has most market share. Once again the income elasticity is statistically significantly lower for rural than for urban households. However, this could have been deduced from the results for the component drinks.

Table 4.5: *Coefficients (Elasticities) and Intercepts for Rural and Urban Households (1987)*

	Coefficients (S.E)		*Difference t Test*
	Rural	*Urban*	
Beer	1.06 (.06)	1.14 (.07)	.89 NS
Spirits	.74 (.14)	1.26 (.06)	3.70 **
Wine	.99 (.23)	1.76 (.17)	2.75 *
Total	1.00 (.06)	1.20 (.05)	2.56 *

	Intercepts (S.E)		*Difference t Test*
	Rural	*Urban*	
Beer	-3.84 (.3)	-4.04 (.38)	.42
Spirits	-3.47 (.75)	-6.28 (.34)	NA
Wine	-6.66 (1.23)	-10.05 (.93)	NA
Total	-3.23 (.31)	-4.12 (.24)	NA

Notes: NA = Not Applicable
* = Statistically significant at 5%
** = Statistically significant at 1%

4.6*: Differences in Alcohol Consumption Between Geographical Regions*

The data from the Household Budget Survey can also be broken down by geographical region and analysed. There are eight regions:

East	Dublin, Kildare, Meath, Wicklow
South East	Carlow, Kilkenny, Tipperary South, Waterford, Wexford
South West	Cork, Kerry
Mid-West	Clare, Limerick, Tipperary North
West	Galway, Mayo
North West	Donegal, Leitrim, Sligo
Midlands	Laois, Longford, Offaly, Roscommon, Westmeath
North East	Cavan, Louth, Monaghan

Table 4.6 gives data on alcohol expenditures in these regions and associated data. The table shows definite differences between regions in total alcohol consumption and in the composition of that consumption.

Table 4.6: *Comparisons by Planning Region (Expenditures in IR£ per week)*

	E	*SE*	*SW*	*MW*	*W*	*NW*	*M*	*NE*
Number of Households	2959	842	1208	748	597	528	456	367
Average Household Size	3.5	3.5	3.6	3.4	3.5	3.4	3.4	3.5
Total Expenditure	243	210	223	231	213	186	193	188
Beer Expenditure	9.3	7.5	7.8	8.3	6.8	5.2	6.3	6.3
Spirits Expenditure	2.0	1.5	1.4	1.8	2.0	1.7	1.8	2.0
Wine Expenditure	1.2	0.4	0.5	0.4	0.6	0.4	0.4	0.3
Total Alcohol Expenditure	12.5	9.4	9.7	10.5	9.4	7.3	8.5	8.6

Source: CSO *Household Budget Survey, 1987*. Volume 1.

The East has by far the highest alcohol intake, but it also has the highest income, or total expenditure, level. Obviously, too, regions will differ in the proportions of their households classified as rural or urban with the vast majority of the East households in the latter category. So differences between the East and other regions will follow from the rural-urban effects detected in the previous section as well as from income effects. Table 4.7 shows coefficients and intercepts derived for the regions for the case of total alcohol. Analysis is restricted to total alcohol simply because with eight planning regions the numbers of intercepts and coefficients become rather tedious to present if disaggregated to beer, spirits and wine.

The income elasticity for the East region is the highest and considerably greater than the value for some of the other regions. Conducting t tests for the difference between East and other regions gave significant results for the comparisons with the Mid-West, West and North West. Now, in strict logic, t tests can be criticised on the grounds that doing seven tests, each at a 5 per cent level, does not mean the significance levels for the set of tests has been held at 5 per cent. Indeed an F test, which does allow for all possible tests, is not significant at the 5 per cent level. However, it is a large value and F tests are known to often fail in finding real differences, and so it would seem reasonable to conclude that there are significant differences in income elasticities between regions. The underlying reason may go back to the rural-urban difference and be implied by it. Given different coefficients, further tests for equality of intercepts seem unnecessary, for the reason given earlier. The fact that the income elasticity of alcohol consumption is highest in the East as well as the fact, evidenced from the sample numbers in Table 4.6, that the East is the most populated region, mean that the overall impact of any scheme to control alcohol intake will largely depend on results in the East region. Of course, the fact that the East region has the highest average expenditure on alcohol, and the highest tendency to spend increased income on alcohol, does not necessarily mean that the region has most of the problems due to alcohol consumption.

Table 4.7: *Coefficients for Total Alcohol by Region*

Region	*Coefficients (Elasticities)*	*Standard Error*	*t Test for East versus Others*	*F*
East	1.26	0.087		
South East	1.07	0.088	1.54 NS	
South West	1.11	0.087	1.22 NS	
Mid-West	0.92	0.087	2.76 *	1.8 NS
West	1.00	0.086	2.11 *	
North West	0.97	0.087	2.36 *	
Midlands	1.25	0.087	0.08 NS	
North East	1.08	0.087	1.30 NS	

Notes: NS = Not statistically significant at 5 per cent
* = Statistically significant at 5 per cent.

4.7: *Household Size Effects on Alcohol Consumption*

How household expenditure on alcohol will vary with household size is obviously of interest. Unlike the rural-urban dichotomy or region, household size is a quantitative variable measured for each household, so two possible analysis approaches are feasible. First, household could be broken into groups by household size and separate intercepts and coefficients fitted by the same procedure as in the previous sections. Alternatively, household size could be treated as a variable like total expenditure and regressions performed over the whole data set on two continuous explanatory variables. The latter approach will be adopted in this section, because groups can also be formed by household composition, which not only takes account of numbers, but also of age structures, and this will be done in the next section.

It should be said that simple household size should not be expected to be particularly informative. The reason is that household income is likely to be closely related to household size, in that households with several adults will probably have several income earners and even in households with a single earning adult income will increase (on average) with the number of children even if only because the adult is probably older. Table 4.8 shows income (total expenditure) and expenditure on alcohol for a range of household sizes.

Table 4.8: *Total Expenditure and Alcohol Expenditure for Household Size*

Household Size (No. of Persons)	*1*	*2*	*3*	*4*	*5*	*6*
Sample sizes	1453	1600	1035	1242	1084	679
Total Expenditure (IR£/week)	92	177	244	269	287	296
Alcohol Expenditure (IR£/week)	4.6	8.3	11.9	12.9	13.7	12.8

Source: CSO *Household Budget Survey, 1987*, Volume 1.

Clearly, total expenditure, or income, increases rapidly with family size at first, but then more slowly. This is presumably because children do not earn income. Nor do they consume alcohol and the expenditure on alcohol shows a near doubling in going from 1 to 2 persons, but negligible increases from 3 to 6. Obviously, it will be difficult to disentangle any size effect from the income effect and this is borne out by analysis. The results of regression on both income and household size are shown in Table 4.9. The household size variable did not emerge as even statistically significant and this is because household income alone explains alcohol consumption very well. As already said, it is not the case that household size is considered to be unimportant, but size changes are highly correlated with income changes. It would be possible to separate adults from children, so replacing the single size variable by the two variables: number of adults and number of children. This might have somewhat more explanatory power, but it will not be pursued here because household composition can be handled in more detail by forming groups as will be done in the next section.

Table 4.9: *Coefficients and Tests on Income and Household Size*

	Coefficient (Elasticity)	*Standard Error*	*t test*
Total Expenditure (Income)	1.08	0.11	9.9 ***
Household Size	0.12	0.17	0.7 NS

Notes: NS = Not statistically significant at 5 per cent
*** = Statistically significant at 0.1 per cent.

4.8: *Household Composition Effects on Alcohol Consumption*

The nine types of household, defined by family composition, are

Households consisting of a single adult aged under 65	= 100
Households consisting of a single adult aged over 65	= 1E00
Households consisting of two adults both aged under 65	= 200
Households consisting of two adults where at least one is over 65	= 2E00
Households consisting of two adults and one young child	= 210
Households consisting of two adults and one older child	= 201
Households consisting of two adults and two younger children	= 220
Households consisting of two adults and two older children	= 202
Households consisting of two adults, one young and one older child	= 211

Here a young child means under 5 years of age and an older child between 6 and 15 inclusive. Sixteen or over is classed as adult. Obviously these are not exhaustive categories of household composition but they occur relatively frequently.

The details of the categories of household composition used are given in Table 4.10. This level of detail is not available in the published volumes of the Household Budget Survey and the data were specially obtained from the CSO.

Table 4.10: *Sample Size and Expenditures Classified by Household Composition*

Household Composition	*Sample Size*	*Mean Expenditure on Alcohol IR£ per week*	*Mean Total Expenditure IR£ per week*
100	728	8.91	156.3
1E00	726	4.04	118.7
200	745	9.89	215.6
2E00	790	8.79	178.0
210	326	10.89	235.6
201	126	10.48	237.4
220	221	8.02	225.4
202	218	7.89	234.0
211	227	8.08	239.6

Note that the overall frequency of some household types, especially the 2 adult and 1 older child category, was such that divisions into 10 income groups would mean relatively low cell numbers. So some household composition groups or subdivided into fewer than 10 income categories. It is quite clear from Table 4.10 that average expenditures on alcohol differ greatly between the groups, but so does mean total expenditure. The results of estimating different coefficients and intercepts for the various household compositions are shown in Table 4.11. The overall F test for differences between coefficients was not statistically significant, nor were any of the t tests for differences between the coefficients for the first group by household composition (single adult, aged under 65) and the coefficients for the other groups. The largest coefficient, and indeed the largest t value for comparison with the first group, corresponded to the 2 adult and 1 older child category, but it will be remembered from Table 4.10 that this was the household composition with the lowest frequency in the survey. A "significant" t value (at 5 per cent) could be just about reached by comparing the lowest and highest coefficients, but such a procedure is invalid since it is really a range test and if compared to the correct criterion also leads to a non-significant value. In general, choosing the comparisons to make after examining the results invalidates t tests.

Taking a common coefficient, or income elasticity, that is reasonably compatible with the data, the intercepts were estimated subject to this coefficient. These estimated intercepts are given in Table 4.11. The F test was highly significant as were many t tests. Bearing in mind that the model is fitted in logs, a negative intercept implies that the smaller the magnitude the greater the consumption of alcohol at any fixed level of income, or total expenditure. Therefore, at a given income, alcohol consumption and expenditure is highest in households consisting of single adults aged under 65 years, which is perhaps not very surprising. The lower alcohol consumptions, at equal incomes, of households with children are also not surprising, given that children imply certain expenditures and reduce the discretionary expenditure available for luxury goods. It is true that the 1 young child household did not have a significant t value, but this is the least "costly" child

Table 4.11: *Coefficients (Elasticities) and Intercepts for Total Alcohol by Household Composition.*

Household Composition	*Coefficients*	*t Test for 100 versus Others*	*F*
100	1.03		
1E00	0.71	-1.09 NS	
200	1.31	1.03 NS	
2E00	0.89	-0.45 NS	
210	0.82	-0.72 NS	1.53 NS
201	1.50	1.69 NS	
220	1.08	0.18 NS	
202	1.27	0.80 NS	
211	0.77	-0.87	
Household Composition	*Intercepts*	*t Test for 100 versus Others*	*F*
100	-3.18		
1E00	-3.62	-3.28 **	
200	-3.46	-2.19 *	
2E00	-3.36	-1.40 NS	
210	-3.38	-1.53 NS	4.50***
201	-3.56	-2.87 **	
220	-3.72	-4.14 ***	
202	-3.77	-4.51 ***	
211	-3.68	-3.77 ***	

Notes: NS = Not statistically significant at 5 per cent,
* = Statistically significant at 5 per cent,
** = Statistically significant at 1 per cent,
*** = Statistically significant at 0.1 per cent.

structure and the intercept did fit the appropriate pattern. The considerable difference from households consisting of a single elderly adult may well include more than age effects. The longer female life span may mean gender differences in alcohol consumption are also involved.

In general, these analyses do not suggest that policy measures ought to be specifically tailored to household compositions. Income elasticities are the same and a lot of the intercept differences between households with and without children could probably be considered indirect income effects, in that children imply committed expenditures and so reduce discretionary income, or even behavioural effects as people alter their lifestyle when they have children. On the other hand, some of the differences between groups are large. The difference in intercepts between single adults under and over 65 implies an alcohol expenditure of 50 per cent higher for the former group, even at equal incomes.

4.9: *The Effects of Social Group on Alcohol Consumption*

In some ways the social group classification is potentially the most interesting of the possible categorisations of households. For example, it is plausible to suppose that quite different patterns of wine consumption with income may exist in different groups. So in the case of social group total alcohol expenditure will be disaggregated into its components, in spite of the additional description that this will entail. In the Household Budget Survey the categorisation "Social Group" is based on the profession of the head of household. There are six groups, although an "unknown" group is also listed by the CSO but omitted here. The groups are

1. Professionals, Employers or Managers.
2. Salaried Employees.
3. Non-manual Workers.
4. Skilled Manual Workers.
5. Unskilled Manual Workers.
6. Farmers and Agricultural Workers.

Table 4.12 gives details of alcohol consumption and other relevant statistics for households grouped according to this criterion.

Table 4.12: *Comparison by Socio-Economic Group*

Socio-Economic Group	*1*	*2*	*3*	*4*	*5*	*6*
Sample Sizes	1267	1006	924	1447	908	1166
Household Size	3.6	3.3	3.8	4.1	3.8	3.6
Total Expenditure	349	252	222	225	172	204
Beer Expenditure	9.1	8.2	9.3	9.9	9.2	7.0
Spirits Expenditure	2.1	2.2	1.5	1.7	1.3	1.7
Wine Expenditure	2.1	0.9	0.5	0.3	0.3	0.3
Total Alcohol Expenditure	13.3	11.3	11.3	12.1	10.8	9.0

Source: Household Budget Survey, 1987, Vol. 1.

Expenditure on alcohol is highest for Social Group 1, which is also the highest income group. However, this group's expenditure on beer is actually somewhat lower than the expenditures for Groups 3, 4 and 5. But spirits expenditure and, above all, wine expenditure is greater for Group 1. Indeed, it is only for this social group that expenditure on wine matches that on spirits. Perhaps a reminder that other alcoholic drinks have been included with wine is desirable. Table 4.13 gives the results of the regression analyses for beer expenditure from the social groups.

The procedure for testing for differences is the same as that used previously for regional effects and for household compositions. There are no statistically significant differences between the coefficients of the groups when tested by t tests.

Table 4.13: *Coefficients for Social Groups for Beer Expenditure.*

Socio-Economic Group	*Coefficients*	*Standard Error*	*t for Group 1 versus Others*	*F*
1	1.32	0.12		
2	1.11	0.10	1.24 NS	
3	1.31	0.12	0.06 NS	0.94 NS
4	1.19	0.12	0.77 NS	
5	1.09	0.10	1.36 NS	
6	1.25	0.09	0.41 NS	

Note: NS = Not significant at 5 per cent.

The model was then re-estimated with the restriction of a common coefficient, but the intercepts left to vary. The differences between the intercepts for all other groups and for Social Group 1 are analysed in Table 4.14.

All differences are highly statistically significant. This means that although all social groups would increase their beer consumption by the same percentage amount given a 1 per cent increase in income, their expenditures on beer would still differ substantially at the same income. Since the differences in the table are all positive and remembering the double-log model, the exponentials of the differences give the additional proportions the groups would spend on beer relative to Social Group 1, assuming they had equal income. They are: 1.4, 1.73, 1.9, 2.46, 1.38, respectively.

Table 4.14: *Differences Between Intercepts of Groups 2-6 and Group 1 in the Beer Equation*

Socio-Economic Group	*Difference*	*Standard Error*	*t Test of Difference*	*F*
2	0.34	0.07	4.7***	
3	0.55	0.07	7.7***	
4	0.64	0.07	8.9***	36.8***
5	0.90	0.07	12.4***	
6	0.32	0.07	4.5***	

Note: *** = Statistically significant at 0.1 per cent.

The interpretation is that if households in Social Group 2 had as much income as households in Social Group 1, they would drink 40 per cent more beer than them. (As will be seen, though, they would drink less wine.) The near 250 per cent effect for Social Group 5 may seem extreme, but reference back to Table 4.12 shows that although this group had only half the income of Social Group 1, they spent more on beer. Note that they spent less in total on alcohol. There seem to be strong social group influences on composition of alcoholic drinks.

These analyses are repeated for spirits, commencing with an examination for differences between coefficients as shown in Table 4.15.

Table 4.15: *Coefficients for Social Groups for Spirits Expenditure*

Socio-Economic Group	*Coefficient*	*Standard Error*	*t for Group 1 versus Others*	*F*
1	1.06	0.39		
2	0.90	0.30	0.31 NS	
3	1.18	0.32	-0.23 NS	0.12 NS
4	1.09	0.36	-0.06 NS	
5	1.18	0.31	-0.23 NS	
6	1.00	0.28	0.12 NS	

Note: NS = Not statistically significant at 5 per cent.

Again, there are no detectable differences between income elasticities or coefficients. Continuing to the examination of intercepts, the results are shown in Table 4.16. There are no appreciable differences between intercepts and so for spirits a single equation adequately represents all groups. That is to say, households with the same income will consume the same amounts of spirits irrespective of their social group.

Table 4.16: *Differences Between Intercepts of Groups 2-6 and Group 1 in the Spirits Equation*

Socio-Economic Group	*Difference*	*Standard Error*	*t Test of Difference*	*F*
2	0.02	0.19	0.07 NS	
3	-0.28	0.19	-1.04 NS	
4	-0.12	0.19	-0.45 NS	0.68 NS
5	-0.14	0.20	-0.52 NS	
6	-0.06	0.19	-0.22 NS	

Turning to wine, the analysis for differences between coefficients fails to prove a significant difference, but the analysis for differences between intercepts does find differences between groups. These are illustrated in Table 4.17.

Note that all the differences from Social Group 1 are now negative, indicating that a household from this Social Group will consume more wine than a household from another Social Group even if their incomes are equal. Translating into proportions says that the wine consumption of households of Groups 2, 3, 4, 5 and 6 would be 0.46, 0.34, 0.29, 0.24 and 0.33 of the consumptions of households of Group 1, even if incomes were equal. A glance back at Table 4.12 shows how plausible these proportions are.

Table 4.17: *Difference Between Intercepts of Groups 2-6 and Group 1 in the Wine Equation.*

Socio-Economic Group	*Difference*	*Standard Error*	*t Test of Difference*	*F*
2	-0.76	0.25	-2.15*	
3	-1.07	0.25	-3.02**	
4	-1.24	0.25	-3.57**	7.8***
5	-1.44	0.26	-4.07***	
6	-1.12	0.26	-3.17**	

Note : * = statistical significance at 5 per cent level,
** = statistical significance at 1 per cent level,
*** = statistical significance at 0.1 per cent level.

Repeating these analyses for total alcohol, we find, as expected, that the income elasticities or coefficients are the same for all groups. Again, significant differences are found between intercepts as shown in Table 4.18.The differences are all positive and except for the comparisons with Groups 2 and 6, are statistically significant. This means that Social Group 1 would spend less on drink than other Social Groups at equal incomes. Of course, Social Group 1 actually spend more than other groups on alcohol as Table 4.12 showed, but this is because they have more income to spend.

Table 4.18: *Differences Between Social Group Intercepts for Total Alcohol*

Socio-Economic Group	*Difference*	*Standard Error*	*t Test of Difference*	*F*
2	0.17	0.075	1.60 NS	
3	0.27	0.075	2.54 *	
4	0.36	0.075	3.39 **	14.8***
5	0.58	0.076	5.47 ***	
6	0.12	0.075	1.13 NS	

Note : NS = Not statistically significant at 5 per cent level,
* = statistical significance at 5 per cent level,
** = statistical significance at 1 per cent level,
*** = statistical significance at 0.1 per cent level.

All groups have the same income elasticity, in that they will increase spending on alcohol by the same percentage, given a 1 per cent increase in income. However, if one imagines incomes being forced to equality, Groups 2, 3, 4, 5 and 6 would spend 1.18, 1.31, 1.43, 1.79 and 1.13 times more on alcohol. The previous analyses have shown how this situation comes about. Social Group 1 would spend proportionately less on beer than the other Groups, but proportionately more on

wine. However, beer consumption greatly exceeds wine in all groups, even in Group 1, so the first effect predominates in the overall. Social group seems to have no effect on spirits consumption, which appears to be purely income determined.

4.10: *Stability of Estimates and Some Implications*

The Household Budget Surveys are only conducted at seven-year intervals and so an adequate time series of data suitable for estimating price elasticities cannot be built up. Similar analyses were conducted on the 1980 survey to some of those already described for the 1987 survey, but only to check for stability of relationships. Where relationships are changing, it is obviously the results derived from the most recent survey that are of most interest (and are perhaps often the only results of interest). However, some overall contrasts of the 1980 and 1987 surveys may be useful. Using precisely the same methods and models on the 1980 data gave the overall income elasticities shown in Table 4.19. The 1987 values are included for comparison.

Table 4.19: *A Comparison of 1980 and 1987 Income Elasticities*

	1980	*1987*
Beer	1.04	1.06
Spirits	1.20	1.22
Wine	1.48	1.63
Total Alcohol	1.14	1.15

With the possible exception of the rise in the income elasticity of wine, the estimated income elasticities are remarkably similar. This will be disheartening if any decrease had been expected due to modified attitudes to drinking over the period. On a technical note, the stability of the spirits elasticity is further evidence in favour of the estimate employed in the first report, where the time series data were suspect due to cross-border smuggling of spirits. We could continue to draw comparisons between 1980 and 1987 and show the considerable stability that shows up for other results too. Not every analysis can be perfectly parallelled on the two surveys, because some definitions and conventions were changed between the surveys. However, there is probably no great virtue to looking at the 1980 survey in great detail in any event. The similarity of the figures in Table 4.19 make the main point that it may not be easy to change people's preferences or patterns of behaviour.

It is worth noting too that the survey estimates of income elasticities, even when based on disaggregated data for particular types of households, are reasonably compatible with the estimates obtained in Chapter 3 from aggregate time series data. This is important because it is sometimes suggested that estimates based on aggregated data may actually be averaged over widely differing elasticities at disaggregated level and that conclusions drawn from overall data might therefore not apply to subgroups of interest. It is true that authors who fear the operation of this "ecological fallacy" (Robinson, 1950) are usually concerned with the

application of aggregate relationships at individual level; see, for example, Norstrom (1989), but clearly evidence of instability of the sub-aggregate level would greatly weaken extension to the individual level.

It is unfortunate that similar examination of the stability of price elasticities cannot be obtained from the Irish surveys. At least one UK study by Kendell, de Roumance and Ritson (1983), claim to have found high price elasticities and low income elasticities with cross-sectional data, when UK time series data (e.g. Duffy 1983) has found lower price elasticities and higher income elasticities.

Chapter 5

PROBLEMS AND COSTS OF ALCOHOL ABUSE

5.1: *Introduction*

This chapter attempts to make an overall comparison of the costs and benefits associated with alcohol consumption. So it must consider the detrimental effects of alcohol, although this is an area where it is notoriously difficult to obtain data that are both comprehensive and reliable. However, the issues and judgements involved cannot be reduced to merely factual statements, even supposing there were no problems with information availability.

A common perception on the issue of alcohol consumption is that most drinking is moderate, harmless and that much benefit or enjoyment can be derived from it. A survey (Cribben, 1989) seems to confirm this perception of alcohol being a "social lubricant", or mood altering substance, particularly among young people. Much of Irish social life traditionally has revolved around alcohol, particularly in the public house which often serves as a community focal point, or meeting place. "Going to the pub" is still frequently indicated as a favourite entertainment and leisure activity, although it ranked behind "favourite sport/interest" and "restaurant". However, these two categories are also associated with alcohol consumption, given the increase in the number of sports clubs with bar facilities and the growth in wine consumption with meals. This situation is not unique to Ireland. Many authors attributed the observed increases in alcohol consumption in the developed world in the last two decades to increased leisure time and the availability of alcohol in the places where people use their leisure; see, for example, van Iwaarden (1989).

The majority of people who consume alcoholic beverages seem to do so in moderation and experience few adverse consequences. However, high levels of alcohol misuse do lead to problems such as addiction, morbidity, mortality and to a wide range of family, social and public order consequences. These problems created by alcohol impose costs on individuals, their families and on society in general.

In the whole field of alcohol misuse studies, considerable debate has centred on topics such as the costs that should be considered and how these should be measured. The debate continues to the methods that might correct "deviant" behaviour and to policies as regards alcohol availability, affordability and advertising. Should the medical emphasis be on prevention or treatment? Should prevention policies be aimed at particular categories of the population? Many other questions could be posed too and the different views appearing in the literature may

reflect more than technical disagreements. Kendell (1987) may not have been entirely in jest when he mentioned the possibility that the DHSS (1981) document on drinking sensibly could have been written by the Brewers' Society.

Medical Consequences and Mortality

There is strong evidence of the harmful impacts alcohol abuse can have on peoples' health, with these adverse effects occurring throughout the body. Organs and functions affected include: the brain, the digestive system, the liver, the muscle system, blood, kidneys, lungs, endocrine system and sexual and reproductive functions (DHSS, 1983). These health risks increase the morbidity and mortality rates for such alcohol related illnesses as alcoholism (however defined), alcohol psychosis and cirrhosis of the liver. Relevant research results on these issues include Walsh and Walsh (1973), Schmidt (1977), Cook (1981) and Walsh (1987). Alcohol abuse among females has been shown to lead to menstrual cycle effects and in pregnancy heavy drinking can give rise to Foetal Alcohol Syndrome (Jones *et al.*, 1973). There is some evidence that there is a causation between heavy alcohol use and increased risk of breast cancer (Willet *et al.*, 1987). There is also evidence that large amounts of alcohol may be associated with increased mortality due to coronary heart disease (CHD), Hennekens (1990).

However, when it comes to quantifying the dose-response relationship underlying the findings, matters are not unambiguous. Taking cirrhosis of the liver as a first example, aggregate statistics on alcohol consumption and cirrhosis deaths do seem to rise and fall together. See, for example, Kendell's (1984) account for the UK. However, Stuart and Mann (1991) tend to place weight on dietary changes and new treatments for alcohol abuse in explaining reductions in cirrhosis deaths. One factor responsible for the uncertainty is that cumulative effects over many years are involved in cirrhosis cases. Wodak *et al.* (1983) maintained that patients with liver disease had less of an alcohol dependency syndrome than typical problem drinkers, because otherwise they would not have been able to sustain the heavy alcohol consumption over many years associated with liver disease. This point is reiterated by Bird (1991), who also asserts that the frequently quoted "safe drinking" quantities have allowed for an extremely large margin of error, at least as regards alcohol induced liver disease.

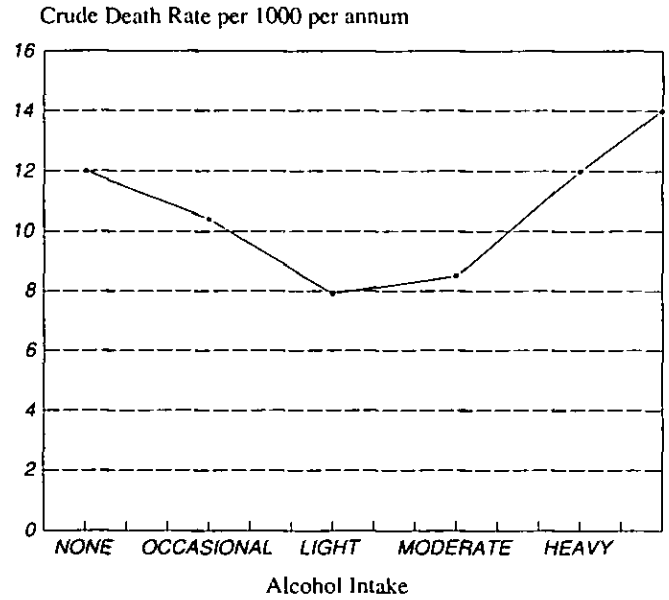
Taking the alcohol and foetal death case as a second example, there have been US studies that suggest that levels of drinking considerably below what might necessarily be understood by "heavy" are harmful for the foetus. These studies have been reviewed by Knupfer (1991), who was very critical of the quality of the research and who felt the studies were at least partly motivated by an ideological push in the US to convince pregnant women not to drink alcohol at all. The review concluded that there was really no evidence that light drinking was harmful to the foetus.

While it is certain that excessive alcohol consumption damages health, it is not at all clear what the lower bound to "excessive" is. Obviously, the problems of estimating total alcohol related mortality, including both direct causative and indirect mechanisms, is more difficult still. Even with direct causation there is the difficulty that there was once undefined reluctance to record alcohol as a cause of death, perhaps because of sympathy with the family of the deceased, see Dean and Duffy (1971). In many countries the statistics have improved, at least partly because of corrective programmes (see Bell and Cremona, 1989), but the problem remains of how to sort out real trends from data where the precision has been changing during the period under investigation. However, in spite of all these difficulties the exercise of estimating total alcohol related mortality has been undertaken by various authors. For the US, Stinson and De Bakey (1992) estimated that 5 per cent of all US deaths in 1988 were alcohol related. They calculated age-adjusted mortality rates over the period 1978 to 1988 and showed these declined with consumption levels.

Studies of restricted sub-sections of the population can overcome some of the difficulties already mentioned, but with a counterbalancing uncertainty about the range of applicability of the findings. For Sweden, Andreasson *et al.* (1991) followed up military conscripts 20 years on and found that mortality increased from abstainers to moderate drinkers and that it increased even more for heavy drinkers. As might be expected with this age group overall mortality rates were low and few deaths were attributable to direct toxic effects of alcohol, but rather to suicide and accidents. How studies like this can interpreted depends in part on how stable an individual's preference for alcohol will be over his/her lifetime. Many report, Calohon (1970) for example, that alcohol consumption declines with age, having allowed for income and price effects. However, Temple and Leino (1989) claim that for the US, recently collected follow-up studies demonstrate stable preferences as male drinkers age.

Yet another complication with the alcohol-mortality relationship is that there are published findings claiming an inverse relationship between alcohol consumption, at least up to some limit, and mortality at least when restricted to some bodily failures. St. Leger *et al.*, (1979) claim that moderate drinking, especially of wine, lower the risk of death from coronary heart disease. This has led some authors to describe the alcohol mortality curve as U shaped and the representation given by Shaper *et al.* (1988) is shown in Figure 5.1. This was based on a follow-up survey of 7,735 middle-aged British men, 504 of whom had died in 7.5 years since the first survey. This survey reported a U shape relationship between alcohol intake and total mortality and an inverse relationship with cardiovascular mortality even after adjustment for age, smoking and social class. The figure shows mortality as the crude death rate per 1000 per annum and alcohol intake classification used is occasional (less than 1 unit of alcohol per week), light (1 - 15), moderate (16 - 42) and heavy (more than 42 units).

Figure 5.1: *Alcohol Intake and Mortality.*



Source: Shaper *et al.*, (1988).

The mortality is relatively high for non-drinkers, lower for moderate and for even moderate to heavy drinkers and then high again for heavy drinkers. Indeed, if believable, the Figure 5.1 implies that quite a lot of alcohol has to be consumed before drinkers inflict as much mortality risk on themselves as abstainers do. Many researchers in alcohol studies are doubtful about the existence of any substantial health benefits derivable from alcohol consumption. For example, Kendell (1987) felt that benefits, if existing at all, would be modest and occur at very low intakes. He added "predictably, the alcohol industry has seized on the findings and incorporated the idea that regular moderate drinking is good for people's health into its advertising".

Knupfer (1987) reviewed the research findings that purported to demonstrate the beneficial health effects of moderate drinking and found them very flawed indeed. Perhaps more recent research carries greater weight, but it seems that important though alcohol studies are, the quality of experimental methodology and analysis do not always reach the standards that might be demanded in other fields.

Psychological, Social and Other Consequences

In some individuals alcohol consumption, or at least excessive consumption, can result in serious mental illness like alcoholic dementia and hallucinosis or delerium tremens. Depression, which can contribute to suicide, may be induced by alcohol dependence, but the causal link could also run in the opposite direction. Alcohol also plays a very substantial role in many social disruptions. Drinkers are

over-represented, relative to non-drinkers, both as victims and participants in accidents, crime, public disorder and family conflicts. As regards accidents, excessive drinking is a contributory factor in a high proportion of road traffic deaths and injuries and the subsequent grief and misery that they generate. Less serious, but still important, is the material damage to vehicles in traffic accidents where personal injuries are avoided. Accidents at work are one way in which alcohol abuse impacts on industry, although absenteeism and lower productivity are possibly even more important mechanisms. Certain categories of occupations and workers display particularly high frequencies of such work-related accidents. Finally, accidents in the home are also often alcohol-related and the injured parties need not be restricted to the drinkers themselves.

As in the case of physical health, there are a variety of studies demonstrating the relationship of alcohol consumption to the likelihood of being involved in traffic accidents. The Irish studies on this go back to Blaney (1973). The recent study of US data by Zador (1991) is a good example. The author showed that crash risk increases with alcohol concentration for all 6 age/sex groups analysed, with young drivers having higher relative risks than older ones. Interestingly, Zador claims that females had higher relative risks than males based on statistics from single vehicle crashes, which he regarded as more readily interpretable than data for multiple vehicle crashes. Other references of note include Chaloupua *et al.* (1991) which is particularly relevant to the topic of drinking and late night accidents.

Although these studies generally agreed in finding increased risk with increased alcohol consumption, they were not unanimous as regards the causation for decreased risk in recent years. Some attributed this to the fall in average consumption, especially authors who tended to argue in favour of tax imposed price hikes for alcoholic drinks. See, for example, the use made by Richardson (1990), Gordis (1991) and Wodak (1992) of empirical findings of Cook (1981) and Walsh (1987). But other authors, for example, Lund and Wolfe (1991) and Zador *et al.* (1989), attribute reductions of accident risk to the introduction of legal measures and enforcement by the police. Whether the individuals actually reduced their alcohol consumption at all was not the decisive factor from this viewpoint, the causative effect was that they reduced consumption if driving. It should be noted that attitudes in Ireland have changed from regarding drink driving as a tolerated activity to being an unacceptable reckless act.

In relation to crime, disputes and aggressive behaviour leading to violent assaults seem to be encouraged, if not initiated, by excessive alcohol consumption. UK evidence is available in Walhsley (1986) and Dutch evidence is cited in van Iwaarden (1989). Heavy drinking is frequently cited as a factor in rape, incest and violence towards women (Setters *et al.*, 1989), and as a contributory factor in family violence and is often cited as a reason for marital separation. There is also an indirect, but significant, connection between alcohol and crime through another mechanism. Alcohol dependence leads to large percentages of total income being spent on alcohol and the possible resulting shortage of money and indebtedness may provide

a motivation towards crime. Alcohol is also a contributory factor in many incidents of public disorder and vandalism, as is clearly evidenced by attempts to restrict the access of football hooligans to alcohol before and during certain fixtures.

Family conflicts and problems, apart from the extreme of criminal violence already mentioned, can be created or aggravated by alcohol abuse, and life-long neurotic and behavioural problems for children can result. Again, the large percentage of total expenditure on alcohol in households with individuals subject to addiction can lead to financial problems. While this phenomenon tends to be under-reported in surveys, excessive alcohol expenditure has been indicated as a factor reinforcing poverty in the lower social groups. Poverty, in turn, creates another set of problems for the family including chronic stress and acute psychological distress (Whelan, *et al.*, 1991).

Other implications of alcohol abuse for society could be discussed but one example is its impact on the spread of AIDS. While alcohol does compromise the capacity of the immune system to resist infection, the greater danger it presents is its contribution to unsafe sexual practices and drug use by making people less inhibited by social norms and behavioural restraint (Howard *et al.*, 1988).

Throughout all of this section, the discussion of ill effects of alcohol has not tried to estimate how much of the effects are due to the top quarter of alcohol consumed. As described in the introduction, an investigation of the one quarter reduction visualised by WHO was one of the motivations for this paper. However, the dose-response relationships for the problems already discussed are evidently not precise enough to make that estimation an easy one.

Economic Analysis.

Ideally, economic analysis should translate impacts of alcohol production, consumption and abuse into a common unit of measurement, probably money, so as to quantify the economic costs to society of alcohol. This is not at all easy to do and the various difficulties will soon become apparent. Leu (1983) has suggested that the contribution of economics to alcohol related problems and policies is twofold, first to provide a normative framework for the discussion on alcohol use and misuse and secondly, to provide specific analytical instruments for evaluating policies aimed at reducing alcohol related damage. Two analytical instruments used by economists are econometric methods and cost/benefit analysis. The former instrument was used in Chapters 3 and 4. The latter technique, that of cost/benefit analysis, see Mishan (1972), has been employed in the literature to try to obtain an overall measure of the consequences of alcohol consumption. However, although there is a tradition of trying to monetarise the impacts of alcohol consumption in the international literature on the subject; see, for example, Berry and Boland (1977), there is no agreement as to what factors should be included in the analysis. There has been debate as to whether the technique is even applicable, given the complexity of the issues involved (Single 1983). The results of the analysis can be spurious,

given the high level of subjectivity involved in the estimates, for some of the items do not lend themselves easily to monetary imputation. So should they really be reduced to an accounting procedure?

5.2: *Economic Benefits*

Taking a rather broad view of benefits to commence with, the benefits of alcohol consumption include the employment and incomes derived from the production and distribution of alcohol. They also include the positive contribution alcohol exports make to Ireland's balance of payments and the significant taxation revenues generated for the Exchequer by alcohol consumption. However, some economists challenge the view that tax revenue should be seen as a benefit and would argue that it merely amounts to transfers of purchasing power. This can be countered by the argument that the revenues can be used to ensure more equitable income distribution thereby increasing the welfare of society, so restoring tax revenues as a benefit. All of these benefits can be quantified in money terms, but to carry out a full economic analysis to establish if society's resources used in alcohol production are being efficiently used, assessments of alternatives uses would need to be calculated. To do this, large volumes of empirical data would be required, which are neither easy nor costless to acquire.

Another benefit of alcohol consumption is that consumers derive enjoyment from drinking through relaxation, stress release and provision of opportunities to develop friendships. Placing monetary value on this benefit is a contentious issue. Economic theory on consumer behaviour assumes that consumers reveal their preferences for commodities by their willingness to pay for the goods in the market. It assumes that the consumer knows all the alternatives available, and the full implications associated with them, so that they are choosing with perfect information. It also assumes consumers act in a rational manner, that is they choose goods to maximise their satisfaction, given their tastes and income. If these assumptions hold for alcohol consumption then total expenditure on alcohol reflects the value and the benefits derived from its consumption.

However, using the total expenditure on alcohol as the measure of the benefit derived from alcohol consumption can be disputed because there are market failures associated with alcohol. First there are what economists call externalities, these are the costs and benefits that accrue from alcohol consumption to people other than the drinker. An external benefit could be that the drinkers become more amicable company, while the external costs could include injury to the property or person of the non-drinkers as a consequence of the drinker's behaviour and even the higher taxation endured by non-drinkers to pay for medical treatment of alcoholics. Market prices in a free market will only reflect the costs and benefits to the individual, i.e., private costs, but will not take account of the external impacts, i.e., social costs, and therefore the price paid may not adequately reflect the true cost of alcohol which is the sum of the private and social costs. This market failure can be a justification for the Government to use fiscal instruments to attempt to ensure that drinkers pay the true price of their consumption behaviour.

A further violation of the assumptions behind consumer theory in relation to alcohol is that drinkers may have imperfect information about their actions, such as a lack of risk awareness of the impacts on their health. However, it may be that people know the risks, but still choose to drink alcohol in the full knowledge that there can be a trade-off between enjoyment and having a longer life span. This aspect of deliberate risk taking certainly occurs in other human activities, such as dangerous sporting pursuits. The assumption of rationality may also be invalid in the case of individuals whose actions can be irrational due to their alcohol dependency, although it could be argued that drinkers are not unaware of the risk of becoming addicted when they commence heavy drinking. These market failures associated with alcohol consumption cast doubts on whether total expenditure figures can be used as an indication of the benefits derived from alcohol.

The notion of "consumer surplus", which loosely can be described as the difference between the maximum price which consumers would be willing to pay and the actual price they pay, is another concept of consumer theory that is useful in the study of alcohol. If considerable consumer surplus existed for particular alcohol drinkers, price measures aimed at reducing quantities consumed may not be successful. Alcohol abusers may have greater levels of consumer surplus than other drinkers, due perhaps to their dependence increasing their willingness to pay maximum prices for alcohol. This would suggest that increasing the price of alcohol would reduce the consumption of moderate drinkers faster than that of problem drinkers, but there are counter views to this. Theoretical development by Becker and Murphy (1988) may be revealing. They develop a theory of rational addiction within the standard utility theory framework. Some of the implications include the finding that addictive states can be unstable rather than steady, so that addicts can go on binges or choose to end strong addictions in spite of high withdrawal costs. In particular they state that "addicts respond more to permanent than to temporary changes in prices of addictive goods".

5.3*: Economic Costs*

Some costs have been surveyed in Section 5.2, but the choice of which costs should be included for analysis and how they should be measured gives rise to a methodological debate among economists. The costs of production of alcohol (such as the cost of labour, capital and raw materials), are argued by some economists not to be relevant in estimating the economic costs of alcohol. The rationale behind this argument is the idea of consumer sovereignty in the market, that is, if consumers did not want to buy the commodity, then resources would not be allocated to its production. If one accepts that consumer sovereignty holds true in the case of alcohol then the benefits derived by consumers will be matched by the resource costs and will be reflected in the market price. These private benefits and private costs will offset each other, so that they can be disregarded.

However, the price of alcohol usually exceeds the cost of production and distribution because alcohol bears special excise taxes which counterbalance the social or external costs of alcohol abuse, which are sometimes considered to be the relevant costs for alcohol. Quantifible costs of several types could include

workplace production losses due to absenteeism and illness as well as to accidents attributable to alcohol. There is also the expenditure on health treatment of people with alcohol related problems and the expenditure on social welfare transfer payments paid out to drinkers or their dependents. There are the losses to society from road, fire and other accidents, possibly even involving deaths, where alcohol is a contributory factor. Also, at least some of the expenditure of resources on police and social work is incurred in dealing with problems associated with alcohol abuse. Whether all, or only some, of these costs ought to be set against the excise tax revenue is a complication in cost-benefit analysis.

However, while quantifible in principle, estimates of these society costs will contain high degrees of subjectivity, due to problems of gathering accurate data on true costs. It is also true that other important social costs of alcohol abuse cannot be adequately quantified, although they are perhaps the most significant. Examples are the pain and misery suffered by alcohol abusers, their families and by at least some of the victims of their actions. As will be seen subsequently, no account of these costs will be taken in the analysis, which is a deficiency of the technique as applied.

Even when measurement is possible, the inclusion of some items is debatable. For example, some economists have tried to calculate the economic costs to society of excess mortality attributable to alcohol abuse such as using the loss of output production. However, as far back as the 1930s in Scandinavia, other economists felt that higher mortality due to alcoholism did not constitute a loss to society since it simultaneously lowered production and consumption: so it therefore did not affect average per capita national income (Ohlin, 1930). This argument for not calculating the production losses due to premature death of an alcoholic is perhaps more compelling in times of high unemployment when the position may well be filled by a perhaps more productive worker. As might be expected, very different types of cost-benefit analyses have appeared in the literature depending on what the author has chosen to include, or omit, as benefits and costs. For example, Collins and Lapsley (1991) claim alcohol abuse cost the Australian economy AUS$8 billion in 1988, while McDonnell and Maynard (1985) estimated a cost of £1.5 billion at 1983 prices for England and Wales. The latter authors included not only lost production to industry in the costs but even the value of lost housework and other non-market activities. Their allocation of some of the costs of unemployment to alcohol consumption are perhaps not too convincing given the current climate of high unemployment.

The measurement of the society costs of alcohol misuse can be undertaken from a much more confined approach too. This would be to concentrate on the impact of alcohol for the public Exchequer, which could at least be argued to be of very practical relevance for policy-makers who seem to favour policies that can be accounted for in monetary terms. Walsh (1980) tentatively calculated the economic costs to the Irish Exchequer of alcohol abuse along with the tax revenues contributed by drinkers for the year 1976. The results of this assessment seemed to indicate that, given the high taxes levied on Irish drinkers, they pay more than their costs of alcohol abuse impose on the Exchequer. However, although in this sense the

State gains from alcohol consumption, the excess payment goes into general Government revenues and may not necessarily be set aside to compensate for alcohol abuse. In addition, only certain items were quantifible at all and some of the excluded costs "are precisely those that motivate public opinion to endorse strict alcohol control policies" (Walsh, 1990).

Not all authors who have conducted cost benefit analysis have concluded that drinkers pay their way. Manning *et al.* (1989) claimed that the US alcohol taxes covered less than half the costs drinkers impose on society. Since many aspects differ from one study to another, including the country and the items included, it is very difficult to argue what the implication is for Ireland. In addition to Walsh (1980) the only other cost-benefit study, also from a confined approach, is one commissioned by the Drinks Industry Group (1988). This analysis excludes a remarkable number of items as irrelevant to costing alcohol abuse. For example, damage to vehicles and property in traffic accidents are said to be "generally covered by insurance (which is paid for by all drivers) and is excluded". The fact that the high milage allowances paid to public servants include an insurance element, that the State owns vehicles, that some State owned companies carry their own insurance, etc., are ignored. The report concluded that about 40 per cent of the revenue collected from excise duties would cover Exchequer costs.

Walsh's (1980) estimate was based on 1976 data and his costs can be directly updated for inflation. This leads to a figure in 1988 terms of IR£190 million, or 48 per cent of alcohol excise revenue. In view of the time that has elapsed since Walsh's analysis, it is desirable to check if costs and quantities have changed in a more fundamental way than can be allowed for by inflation updating. However, the data deficiencies that constrained his approach are as formidable as ever, so the task is not a straightforward one.

Commencing with road accident costs, the Environmental Research Unit publish road accident statistics, and the total for 1988 was stated as IR£585 million. The corresponding figure for 1976, which Walsh used in his study, was IR£40 million in the currency value of that year. Allowing for inflation, that would translate to nearly IR£130 million in 1988 terms, but that is still a lot short of IR£585 million. The ERU (1991) did state that their method of estimating costs had been changed from that used in previous years and from the numbers of accident types and the per-accident costs quoted, it is clear that more than half of all total costs can be attributed to accidents involving loss of life. Costing of death is possible in various ways and figures can differ greatly. However, all that need be noted here is that if 1976 definitions were updated, the cost for 1988 would be increased over and above the inflation figures.

Of course, much of accident cost gets borne by insurance companies and ultimately by motorists themselves, but the Exchequers' component is not at all negligible. As regards the risk of accident rather than the cost of one, some increase in the proportion of that risk attributable to alcohol does seem justified on the grounds that the ERU reported that fatal accidents in the small hours have almost doubled over the figures for the early 1980s, a fact that they attribute, in part, to late night drinking. Chaloupua *et al.* (1991) show, using US data, that there is a

strong causative connection between late night accidents and drinking. Again this would tend to raise the overall 1988 figure for accident costs if the adjustment were made.

Turning to health care costs, Walsh (1980) took note of Berry (1976), which suggested 12% of health expenditures are attributable to alcohol, but rejected the figures and used lower estimates by Adelstein and White (1976). However, not all authors regard Berry's costs as exaggerated and Schifrin (1983) felt they were an underestimate. Also the Adelstein and White study only concerned the most serious problem drinkers and other UK admission studies suggest a higher proportion of alcohol related illness. The Irish Medico-Social Research Board (1985) did suggest some decline in alcohol related problems, but expressed apprehension about the future. Once again Walsh's 1976 figures probably are too low by 1988 standards.

Social and community costs include police and social worker time devoted to (non-road accident) offences and problems arising from drunkenness or heavy drinking. There is no solid direct information about how the prevalence of such problems may have changed over the period up to 1988, but perhaps the Garda records on the number of prosecutions for alcohol related non-driving offences may serve as a proxy. Of course, it is not certain that this proxy is truly a good indicator. The largest single offence is that of being in a licensed premises at times outside the legal drinking hours. The number of prosecutions must have some explanatory power, and there was an approximate 25 per cent increase in incidence up to 1988. Again some upward adjustment to the overall cost would be indicated.

Illness, absence or working inefficiency due to alcohol abuse impose costs on industry and business, although once again only the vaguest information exists about them. Walsh (1980) attributed one-third of all absences from work to drinking, leading to a loss of about 1 per cent in non-agricultural output, or some IR£38 million in 1976 values, but he felt this estimate was the most tentative of all his figures.

Since then Ireland has gone through a long period of persistent high unemployment, with many firms facing tougher competition than in the past as a consequence of EC membership. These factors, plus the recession of the early 1980s, presumably reduced the proportion of inefficient people in employment. In addition, Government restructuring of the pay related component of Disability Benefit in 1983, 1984 and 1987 may have reduced the possible disincentive effects of this scheme. Hughes (1982) had shown a positive association between frequency of certified incapacity from work and the percentage of pre-sickness earnings replaced by Disability Benefit. However, Hughes (1988) said there was no evidence that the scheme was subject to widespread abuse, although it was still desirable that the sickness absence rate be further reduced. Finally, during the 1980s many firms began to formulate their own measures about employees and alcoholism, due to increased awareness of alcohol abuse as a problem. In view of these factors this component of Walsh's 1976 estimate should not be scaled up in line with inflation, or the growth of nominal output. However, the implied reduction is much less than the upward adjustment of either traffic accidents or health costs would imply.

Somewhat similar remarks can be made about transfer payments and the loss of tax revenue to the State. In the 1988 economic environment the losses were probably less than in 1976 in that an alcohol abuser losing employment was more quickly replaced by a tax paying worker. However, the difference would be relatively small. In any event from a cost/benefit analysis viewpoint, the monetary figures for transfer payments and tax lost should not be added to output forgone, because elements of double counting would be involved.

An update of Walsh (1980) to 48 per cent of excise revenue in 1988 is, if incorrect, probably on the low side. Using the fairly limited concept of costs and revenues to the Irish Exchequer, these results on the impact of alcohol on the Exchequer can be compared with findings for other countries reported in the international literature besides those mentioned earlier. High alcohol tax countries, like the UK and Finland, are also net Exchequer beneficiaries, as is Spain, even though it has low rates of taxes on alcohol. On the other hand, France and Sweden seem to be net Exchequer losers, but caution must be used in interpreting these results given the subjectivity with which estimates have been made in other countries too, due to the limited data on the costs involved and also to differences in the items included. Also, the studies were conducted in different years in the various countries. The Finnish study dates from 1978, the Swedish from 1981, while French, Spanish and UK studies were conducted in 1983.

However, it is clear that the approximately 50 per cent for Ireland in 1988, as the ratio of costs to revenue, is not dramatically out of line. Even the Irish Drinks Industry Group's estimate of 40 per cent is not totally incompatible. In the context of this paper the question is not whether the Exchequer gains or loses from the total cessation of drinking, but whether it would gain or lose from a 25 per cent reduction in alcohol consumption. The 50 per cent measure is sufficient to indicate that the Exchequer could conceivably gain from such a reduction. Whether it actually would or not, would depend on which drinkers do the reducing and how they are motivated. Any judgement had better follow the arguments of the next chapter.

Chapter 6

PUBLIC POLICY ON ALCOHOL

6.1: *Introduction*

The consequences of alcohol abuse have been recognized for centuries and its control has been generally viewed as an issue of public policy. The control of alcohol has been justified by policy-makers on the grounds that individuals' use of the substance imposes costs both on themselves and society at large. Restrictions on alcohol availability and minimum drinking ages in most societies are examples of Governments acting paternalistically when dealing with this issue. There has also been a long history of taxation on alcohol use, dating back as far as the Han Dynasty in China right up to the present day use of special alcohol taxes in most societies. There is much debate about the ethics of the Government interfering with the individual's liberty to choose a particular consumption pattern. Sumptuary taxes on alcohol, that is taxes whose effects are desirable on moral or ethical grounds, are common examples of the majority being able to impose its morality upon a minority. Alcohol users could hardly be considered a minority, yet in the context of alcohol use, most people would probably concede that the Government is justified in imposing some restrictions in attempting to limit socially excessive abuse. The question of how far should the Government interfere is a much more contentious point.

The nature of the control has been tempered by the opinion on where the onus of blame for an individual's abuse of alcohol lay. Before the disease concept of alcoholism began to take root at the end of the last century, the blame was firmly placed on the individual for choosing to drink too much. The resulting control measures were primarily focused on prevention rather than treatment, often resulting in the incarceration of the individual who was seen as an offender. The disease concept brought treatment of the individual to the fore and prevention was achieved by use of legislation to curtail alcohol availability.

In the late 1950s attempts were made to explain the etiology of the disease, which became known as the "integration hypothesis". While this approach suggested that attention be given not only to alcoholism, but also to other types of alcohol use, namely "problem drinking" and "social drinking", it still subscribed to the view that alcoholics were a separate group. The integrationists feel that drink related problems are more common in cultures where drinking is less well integrated into daily routines. They would argue that control policies should encourage "responsible drinking" through education to integrate it into normal life. If the population subdivides into two groups, alcoholics and non-alcoholics, if defined by consumption of drink, one would expect statistical evidence of the existence of

the two groups, but empirical evidence by econometricians has not indicated a bimodal distribution in alcohol consumption, so challenging the view that alcoholics are a separate group from the whole population.

Seminal work by Ledermann (1956) suggested that alcohol consumption patterns are best fitted by a single lognormal curve which is highly skewed, see Figure 6.1, indicating that alcoholics consume a large proportion of total alcohol. This research has had a pervasive impact on alcohol strategies internationally because alcohol related damage of all types is not exclusively confined to excessive drinkers (Kendell, 1987). The recommended policy then would be that every drinker in society should reduce his/her alcohol consumption, which is in line to the current proposal by the WHO (1992) to reduce average European consumption by 25 per cent. Given its importance for alcohol policy we examine the Ledermann hypothesis in the next section.

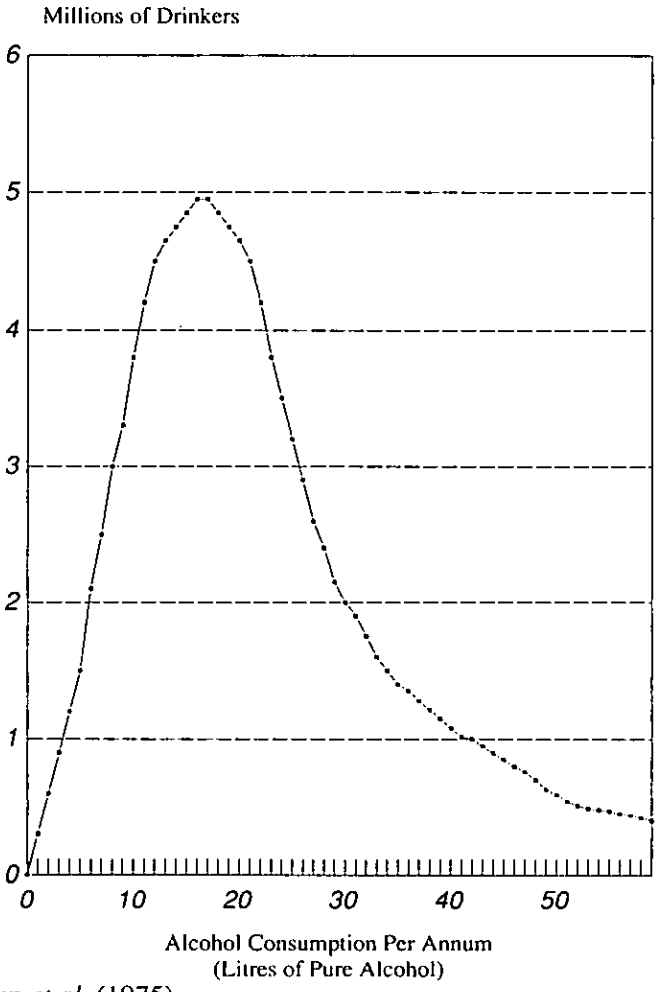
6.2: *Ledermann Hypothesis*

Ledermann's model suggested that the mean, that is the average, is the only parameter of the distribution of consumption that need be ascertained to also predict the dispersion of the population. The model suggests that there is a constant relationship between the per capita consumption and the prevalence of heavy drinkers (Pittman, 1983). The contention is that if average consumption is lowered this will also decrease the consumption levels of alcoholics, so that alcohol policies should be directed at reducing the general level of alcohol consumption in order to reduce the prevalence of alcohol related problems (Bruun *et al.*, 1975). Ledermann contended that an increase in per capita intake in a homogeneous population would lead to a higher proportion of heavier drinkers and in turn to increased alcohol related problems.

However, the notion of an invariant relationship between the mean and dispersion in all samples on alcohol consumption has been criticised. Singh (1979) found that the distribution of alcohol intake is not the same in all populations, so that it is not necessarily true that policies to reduce average consumption will have the same impact on all levels of consumption. Thus, for example, an education campaign aimed at moderation drinking is likely to have different impacts on heavy and light drinkers. Duffy (1986) criticised the static nature of the Ledermann hypothesis, which takes no account of variations in drinking patterns among different ethnic or religious groups. Heavy drinking problems should be distinguished into those that relate to chronic abuse or acute event-based problems.

Ledermann's main concern was with cirrhosis of the liver due to long-term chronic abuse of alcohol, and in this case there is evidence of a direct relationship to average consumption within a population through heavy drinking patterns. Countries with high per capita alcohol consumption, such as France, Spain and Italy, tend to have correspondingly higher rates of liver cirrhosis mortalities than countries with lower per capita consumptions such as Norway, Sweden and Israel (Grant *et al.*, 1983). With event-based problems the average consumption of the population may not be as relevant a factor as say the drinking context; drinking and driving for example. So equating heavier average drinking with more alcohol

Figure 6.1: *The Ledermann Curve.*



Source: Bruun *et al.* (1975)

problems of this type is not strictly true. Ledermann's hypothesis may not be as general in its applicability as is often suggested, but rather applies to problems of chronic abuse of alcohol. Also, even given that a link between alcohol related problems and average alcohol consumption exists, it does not necessarily follow, as supporters of the Ledermann hypothesis believe, that the proportion of heavy drinkers can be altered by adjusting per capita consumption.

However, given that alcohol related damage of all types is not exclusively confined to excessive drinking, Kendell (1987) argued strongly that a reduction in the UK level of alcohol consumption would be beneficial to the nation's health, but felt that the greatest realistic reduction would be to two-thirds of current

consumption. Interestingly, this would leave UK levels close to the current Irish per capita level as shown earlier in Table 3.7. Pittman (1987), drawing on previous research work by Kendell and others, suggested that the overwhelming majority drinking less than the recommended limit reported no adverse effects. He questioned the wisdom of a policy directed at reducing the consumption of these drinkers "who experience no negative consequences" of their drinking. Many studies from the fields of social anthropology and sociology show that drinking patterns are dependent, not only upon economic, demographic and environmental factors, but upon a general cultural ethos.

An effective alcohol policy will need to take account of these demographic, social and economic factors along with the important medical aspects of alcohol abuse. Lessons can be drawn upon from the experiences of alcohol policies used in other countries, but specific policy recommendations in one jurisdiction are rarely applicable directly in others (Single *et al.*, 1981). For instance, even within Europe, acceptable levels of alcohol drinking can vary between countries, with recommended tolerance levels in the UK and Ireland of 21 units for males and 14 units for females. The equivalent recommendations in Norway are lower at 14 and 9 units per week respectively, while recommended tolerance levels in Spain and Germany are higher than in Ireland (WHO, 1990). The older classification in Ireland and the UK, replaced in the late 1980s, recommended a safe upper limit of 50 and 35 units for males and females respectively. However, comparisons can be complicated by variation in measures as the paper by Miller *et al.* (1991) demonstrate.

A unit of alcohol is taken to be 10ml ethanol, which is about equivalent to a glass of beer or a measure of spirits. Converting the Revenue Commissioners data of alcohol consumption into units of alcohol, we estimated that nearly 1,970 million units of alcohol were consumed in Ireland in 1991. This is 14.7 units of alcohol per adult each week on average. Given the gender proportions in the adult population, along with the respective recommended upper consumption limits, the recommended consumption level for the Irish population would be about 17.4 units per adult per week. On this crude estimation it would seem, on average, Irish adults drink within the safe medical limits. However, it is known that not all adults drink alcohol and it has been often been reported that Ireland has an exceptionally high level of abstinence, particularly compared to other European countries. O'Connor and Daly (1983) found that 17 per cent of their study population had never taken an alcoholic drink and a further 7 per cent were ex-drinkers. Nearly a quarter of the Irish adult population abstaining from alcohol is a considerable proportion, although not exceptional given that nearly 36 per cent of Americans are reported to be abstainers (Thornberry *et al.*, 1986). In common with most international surveys, O'Connor and Daly found that a higher proportion of females (30.8%) abstained compared to males (17.2%). Surveys have also found that the proportion of abstainers increases with age, so given the age profile and mortality of the Irish population we would expect the proportions of abstainers to decline over the coming decade.

Adjusting for these abstinence proportions, the average drinker consumed 19.3 units of alcohol per week in 1991. If each drinker consumed at the recommended maximum level given their gender, then 17.8 units of alcohol per week would be the safe level on average. These estimates would suggest then, in the spirit of the Ledermann hypothesis, that Irish drinkers should reduce their average units of alcohol intake by approximately 8 per cent on medical grounds alone. A greater reduction would seem appropriate if the additional social costs of alcohol abuse are taken into account. The admittedly narrowly based and tentative, cost-benefit analysis for the Exchequer given in the previous chapter suggested this level of reduction of consumption need not have adverse revenue effects, especially if the mechanism used is increases in excise taxes. The point made then that much would depend on which drinkers did the reducing is automatically taken care of within the Ledermann framework. It is true that no utility losses by drinkers are being taken into account, but the Ledermann hypothesis and diminishing marginal utility imply such losses are less than proportionate to the intake reduction. They will be smaller still, if the reduction is achieved by switching drinking to lower alcohol drinks, since at least some of the satisfaction of drinking is not directly related to alcohol concentration.

The deficiencies of these crude estimates of average alcohol intake are that the significant variations that exist in the drinking patterns of individuals within the population are ignored. No account is taken of when the alcohol intake occurs within the time period, that is, whether the weekly intake is consumed in one or two sittings, that is episode or binge drinking, or spread evenly over the period. The Ledermann hypothesis ignores such considerations by assuming homogeneous drinking populations, which neglects the important influence of culture on drinking patterns. Sociologists who study alcohol generally prefer to study alcohol problems and drinking patterns in traditional quantity-frequency terms in forming their view of the nature of alcohol abuse (Bucholz and Robins, 1989).

6.3: *Etiology of Alcohol Consumption*

The etiology, or causal factors, of alcohol consumption is a much researched topic. Over the last three decades epidemiology, which is the study of patterns of disease and health in populations, has begun to come to the fore in explaining the etiological factors behind alcohol abuse. Given the growing evidence of a wide range of drink related problems distributed through the general population, it challenges the notion of alcoholism as a disease, from which a certain percentage of the population suffer. The disease concept has been further challenged by evidence that common personality traits of alcoholics, making the "alcoholic personality", have not been found (Mello, 1972). Many sociologists would argue that alcohol dependence is not like other diseases in being a single irreversible disease, for which abstinence is the only remedy, but that it is a heterogeneous and cyclical disorder. The concept that it is a progressive disease is also put at question by evidence of people moving in and out of problem drinking categories, and by evidence that there can be controlled drinking by alcoholics, but these findings in particular are strongly disputed.

The WHO have replaced the term alcoholism with alcohol dependence syndrome in the international classifications of diseases. However, concepts of alcoholism are still evolving and subject to debate, with various issues unresolved. See, for example, Gorman's (1989) criticism of the utility of the approach of Heather and Robertson (1985). Consequently, definitions of alcoholism are subject to revision. The American Society of Addiction Medicine and the National Council on Alcoholism and Drug Dependence recently completed a two year study on the definition of alcoholism in light of current concepts. It redefined alcoholism "as a primary, chronic disease with genetic, psychological and environmental factors influencing its development and manifestations" (see Morse and Flavin, 1992). Alcoholism is described as a progressive and fatal disease "characterised by impaired control over drinking, preoccupation with drug alcohol, use of alcohol despite adverse consequences, and distortions in thinking most notably denial. Each of these symptoms may be continuous or periodic".

Both sociologists and epidemiologists would place more emphasis on the prevention rather than the treatment of alcoholism and on moderation in alcohol use rather than total abstinence. Many factors influence drinking patterns and the probability of an individual developing alcohol related problems. These factors include age, sex, race, culture, religion, hereditary disposition, nationality, income, occupation and the availability of alcohol (Grant *et al.*, 1983). There are a number of etiological factors that alcohol policies must specifically address in order to be effective in achieving intake reductions. To use terminology borrowed from the marketing discipline, alcohol policy may need to take a "rifle" approach rather than a "shotgun" approach; that is, control policy may have to be made up of specific programmes aimed at crucial segments in the population rather than one overall plan. Some of the important etiological factors that policy makers may need to address in formulating a control policy are introduced below.

Age

An individual's age is an important determinant in establishing drinking patterns, but the age groups with the heaviest alcohol consumption vary within Europe. For example, in Norway the heaviest drinking age group was between 20 and 40, while in West Germany it was in the age group between 40 and 50. Demographic factors seem to be the most important determinant in each country. Total alcohol consumption, or alcohol per head of population, clearly depends on the population distribution between children and adults as well as the changing population of non-drinkers among adults. Many studies have revealed that young adulthood (18-30 years) is the time of appearance of first alcohol problems, middle age as the appearance of alcoholism, and old age (60 years plus) as the time of abatement in problems (Fillmore, 1987).

In Ireland a century of population decline came to an end in 1961, when natural population increase finally exceeded emigration and this continued up to the early 1980s. Indeed in the 1970s there was even net inward migration. By the 1980s large cohorts had progressed through the childhood years and reached young adulthood

and a sizable fall in the birthrate suggested that the ratio of children to adults had passed a historic peak. The demographics show that age group 20 to 44 constitutes the largest percentage of the population and at least the younger end of this group are likely to have the highest levels of uncommitted income. Behavioural trends associated with young adults could have been expected to be very observable in these circumstances. However, resumed emigration as a consequence of disappointing economic growth has confused the picture greatly.

The price and income elasticities calculated earlier relate to the population as a whole. Specific sectors within the population, such as the young, may have significantly different price and income elasticity for alcohol. However, due to the aggregated nature of the data collected on alcohol consumption no such breakdown can be achieved using the official statistics. Alcohol related illnesses can take 15 to 20 years to develop and the core of this young generation will eventually constitute the 45 to 59 age group which will be the prevalent age group to manifest problems. If future growth in alcohol related problems is to be avoided it would seem that the current 20 to 44 age group must be targeted for the implementation of policy measures.

Grube and Morgan (1990) found that the number of abstainers among young adults may have dropped to 12 per cent from nearly 20 per cent in the 1970s; see also O'Connor (1978). The percentage of total abstainers is diminishing to a sizeable degree which means, that given the increasing population, there will be more drinkers possibly leading to more alcohol related problems. If the cohorts of young people remain in Ireland, the population of non-drinkers in the population will fall as the cohorts age. Other things being equal, the effect on the national average statistic for consumption will obviously be to raise it, but this need not imply anything at all for the average consumption of the drinker.

Another age cohort that merits consideration is the very young, that is under 14s. Studies have shown that although this group is legally prohibited from consuming alcohol, more than 1 in 3 have had their first drink, with the average age for commencement being 11.9 years of age (Johnson, *et al.*, 1990). However, assumptions of continuity of behaviour in young drinkers need to be treated with caution. Bagnoll (1991) followed a cohort from a Scotish school for 10 years and found that the pattern of alcohol use in their 20s bore little resemblance to their pattern as teenagers.

Gender

There are distinctions in the drinking patterns and the prevalence of alcohol abuse between the sexes. The international evidence is interesting, but must be treated with care when applied to the Irish situation. Females generally drink less than males and as a consequence are less likely to experience problems due to their own drinking. Plant (1990) says evidence suggests that drinking habits of the sexes are not converging so that these differences are likely to persist. However, other studies suggest that rates of alcoholism between sexes are converging in the youngest age cohorts, see Helzer and Burnam (1988). As regards the detrimental

consequences of drinking, Plant shows that females are much less likely to die from alcohol related causes. Table 6.1 shows the international comparisons for deaths from cirrhosis and chronic liver disease categorised by gender.

Table 6.1: *Sex Differences in Rates of Mortality due to Liver Cirrhosis and Chronic Liver Disease*

Country	*Year*	*Males*	*Females*
Australia	(1985)	10.7	4.2
Canada	(1986)	11.8	5.6
Czechoslovakia	(1985)	29.9	10.3
England and Wales	(1985)	5.7	4.7
Finland	(1983)	9.7	4.5
France	(1985)	32.7	13.1
Germany, East	(1985)	20.8	11.3
Germany, West	(1986)	30.0	15.2
Greece	(1985)	15.8	6.5
Ireland	(1984)	3.4	2.3
Italy	(1983)	46.7	20.8
Japan	(1986)	19.7	8.5
Netherlands	(1985)	6.6	4.1
New Zealand	(1985)	5.6	2.5
Norway	(1983)	7.6	4.1
Poland	(1985)	14.7	8.1
Portugal	(1986)	42.1	16.6
Scotland	(1985)	8.7	6.2
Spain	(1981)	31.4	12.4
USA	(1984)	15.3	8.0

Notes: Rates are calculated per 100,000 population
Source: Plant (1990).

Women are also more likely to be abstainers than men, and less likely to be classified as heavy drinkers (Hilton, 1988). Ahlstrom (1981), reporting on Finland, found that females are more inclined to drink wine, while males have a preference for spirits, but even when women tend to drink comparatively frequently, they tend to lose control less often than men. Social contact is associated with alcohol consumption for both sexes, particularly social activities related with work. Some evidence suggests that total abstainers are least likely to work in offices, banks, hotels, restaurants and public bars (Breeze, 1985). These occupations tend to have high female participation, which could be an important contributing factor to findings that young unmarried women are more likely than other women to be heavy drinkers. An all male work environment is also conducive to heavy alcohol consumption.

However, female alcoholic dependents are more likely to develop serious illness problems (Wilkinson, 1980). But Moser (1980) found higher rates of morbidity for alcoholism or alcohol psychosis for men than women. It is accepted that, in some respects, alcohol affects women differently to men given that young women's total body water content is 50 per cent, compared to 60 per cent for young men. They also tend to be lighter in weight, so that women will have a higher peak blood alcohol level than men (Jones and Jones, 1976) and this leads to gender differences for liver damage. There are also interactions of the menstrual cycle and blood alcohol levels and incidences of gynaecological difficulties (Plant, 1990). Recommended tolerance level for females is two-thirds that of males. Finally, gender differences in relation to alcohol related crime and violence seem to indicate that males are more likely to be the perpetrators, while females are more likely to be the victims (Fillmore, 1985).

Occupations

The relationship between alcohol consumption and work has a long history, which is determined by drinking norms, alcohol availability and working conditions. The connection between industry and alcohol consumption is a topic of considerable interest to employer federations who have lobbied the Irish Government on issues such as a curtailment of Sunday night bar extensions. The reason for their concern is that alcohol abuse leads to productivity losses due to absenteeism, accidents at work and reduced competence at task performance. Occupations, which have been identified by a WHO organised conference (WHO, 1990) as being high risk groups for alcohol related problems, include those where heavy drinking is part of the profession's image, where communication is involved, where there is little supervision or low levels of training, low demand and complexity levels, frequent mobility and stress and where there is high accessibility to alcohol. The availability of alcohol may also have implications for some cases of work related alcohol abuse. However, a study by Dean, *et al.* (1979) of male blue collar workers at Guinness Brewery in Dublin, who consumed above average amounts of beer, showed no marked increase in mortality from conditions associated with alcohol.

Other occupational factors said to induce excessive alcohol consumption include monotonous work, shift work, night work, heat, dry air settings, intense physical effort and possible fear of unemployment. There is some evidence that women's drinking at the work place tends to converge towards that of the men; which would stem from the social drinking obligations and the profession's drinking norms. Unfortunately, at least one of the characteristics just listed seem capable of occurring in a very wide range of occupations, which makes the policy relevance of the classifications somewhat obscure. Perhaps this occupational factor in alcohol related problems is best dealt with by prevention programmes in the workplace, tailored to the particular aspects of the occupation.

Nationality and Ethnicity

It can be observed that different nationalities or ethnic groups develop, to a degree at least, distinctive drinking patterns and consequentially have different degrees of alcohol related problems. Religion can be an important determinant. For instance, the Islamic Republic of Iran has an effective total prohibition on alcohol, which is due to religious and cultural beliefs, whereas Finland has been described as having a cultural acceptance of drunkenness (Makela, 1981). Jews are rarely abstainers, but have low rates of alcohol problems. Some ethnic groups in multiracial societies often display extraordinary high rates of alcoholism, such as some American Indian tribes and Koreans in the USA. This has been said of the Irish communities in the past; see, for example, McCoy (1991). An important variable appears to be the degree of acculturation, with higher rates of alcohol abuses the more accultured the group. Excessive drinking has been cited as a factor contributing to the Irish ethnic malaise in the USA (Corcoran, 1993).

Table 6.2: *International Changes in Drinking Patterns 1978-1988*

	Percentage Changes			
Country	*Spirits*	*Beer*	*Wine*	*Total*
Denmark	6.67	2.31	76.21	14.12
France	0.50	-13.39	-23.15	-13.64
Finland	3.64	34.73	19.48	15.87
Germany	-29.67	-1.79	8.82	-7.14
Ireland	-25.76	-20.61	25.52	-19.48
Italy	-47.37	57.72	-31.76	-29.13
The Netherlands	-30.23	-1.77	21.43	-8.79
Spain	-14.29	31.86	-32.29	-16.55
United Kingdom	5.23	-8.33	75.31	4.23

Source: World Drink Trends (1990).

To fully understand the impact of nationality on alcohol consumption a separate sociological study would be required. However, lifestyle developments over the last few decades have moved towards converging drinking patterns among nationalities, particularly in Europe where half of the world's alcohol production is consumed by only one-eighth of the world's population. Traditionally, spirits consumption was predominantly associated with Scandinavian countries, wine consumption with southern European nations and beer consumption with the Benelux, Germany, Britain and Ireland. However, in Finland there has been a move towards more beer and wine drinking and away from the traditional spirits consumption, and Denmark has had the largest growth rate in wine consumption in the world over the last two decades. Germany has also experienced growth in wine consumption along with Britain, Holland and Ireland, where beer consumption

has declined significantly. This contrasts with decreases in wine consumption in France, Spain and Italy, with the latter two experiencing large growth rates in beer consumption as shown in Table 6.2.

In Ireland the official population and labour force projections (CSO, 1988) are highly conditional on various assumptions about the presumed course of future emigration. Currently, the very high rates of emigration have slowed, but this is due more to economic recessions in the destination countries than to any expansion of the Irish economy. The high unemployment at present suggests that very substantial emigration will occur once economic activity in these destination countries recover. In the short term, emigration will slow down behavioural trends or patterns associated with the younger portions of the adult population. However, if in the longer term the Irish economy substantially expands its employment capacity, as is claimed to be both a priority economic and political objective, migrants could be expected to return again as they did in the 1970s.

Irish migrants abroad will probably have adapted their behaviour, to some extent at least, to the patterns of their host countries. Their return would then accelerate the adjustment towards more European patterns. It is probably realistic then under these circumstances to anticipate that Irish alcohol consumption would move upwards towards European levels, unless these levels have begun to trend downwards in response to Community wide changes in attitudes to alcohol.

There is also a new tendency to put drinking into the context of diet, with light beers and light wines becoming increasingly popular. In part, this relates to the greater emphasis on healthy lifestyles and indeed this emphasis has been identified by various authors, cited in earlier chapters, as one of the factors responsible for the reduction in alcohol consumption internationally in recent years. The resolution of the conflicting views on the evidence for beneficial health effects from moderate as opposed to heavy drinking, as referred to in Chapter 5, may matter a lot in this context.

Alcohol policy must be constructed to reflect the stage of economic and social development of a nation in order to be effective. Maslow (1970) identified a hierarchy of needs and wants that individuals pass through as they develop, from physical and psychological needs for survival, for shelter, for companionship, to self esteem and ultimately self actualisation. If individuals use alcohol to bolster their self esteem, a campaign that presents positive benefits from alcohol reduction, not just the avoided negative side effects, would have greater impact. Increasingly, marketeers realise that people have to find a course of action desirable before they will respond. The exceptional growth in non-alcoholic beers and mineral water over the last decade bears testimony to the impact of positive advertising.

6.4: *Development of National Alcohol Policies*

The WHO, in a report by Moser (1980), felt that the focus of activity should shift from treatment to prevention. In an inquiry on alcohol policies in 57 countries the report on Ireland suggested that at that time there was no specific health policy with regard to alcohol (WHO, 1985). Secondary rather than primary prevention was the main thrust of control policy. Primary prevention in this context means

attempting to stop a problem or illness occurring in the first place, while secondary prevention identifies persons in the early stages of illness and refers them to counselling or treatment. The perception was that of alcoholism as a disease, with the emphasis placed on curing alcoholics through intensive treatment in in-patient settings, although some early cases were dealt with through community health care. The Health Education Bureau was briefed to tackle primary prevention by use of educational programmes directed mainly at the young. The emphasis internationally in alcohol policies currently seems to be directed more towards primary prevention (Makela *et al.*, 1981). Public health policy in Ireland is likely to move in this prevention direction. The absence of an explicit health policy on alcohol for Ireland is likely to be rectified as of this year as the Health Promotion Unit are in the process of drafting a national policy document.

While there is consensus emerging that prevention is desirable there is little agreement on how prevention is best achieved. Saunders (1989) in a provocative article challenged the more orthodox views on alcohol control. He claims to have identified five potential paradoxes with existing prevention strategies that can be instructive for policy-makers when formulating alcohol policy. The first is that greater preventive attention is given to drugs that cause the least harm in the general population. This refers to the high public profile given to illicit mood altering substances or "hard" drugs. While the use of these can be devastating at an individual level, the number of deaths that occur in most industrialised countries from alcohol related factors probably greatly exceeds those related to the use of illicit substances. Raw (1986) has claimed a 12 fold differential for Australia, while Britain in 1984 spent IR£1.7 million on anti-opiate campaigns per user death compared to IR£334 per alcohol related death. A counter argument, presumably, might be that without the preventive measures deaths from opiates would be much higher.

The second paradox, according to Saunders, is that the most widely espoused alcohol prevention strategies can often prove to be the least effective. Prevention policies towards drug use can be categorised as aimed at the demand side or the supply side. Prevention policy towards illicit drugs are predominantly supply side measures to curtail availability, yet when it comes to dealing with alcohol the emphasis is on demand side initiatives, such as educational campaigns. Alcohol education campaigns have not been demonstrated to successfully alter behaviour (Kinder *et al.*, 1980). The underlying philosophy of these policy measures has been facetiously compared to teaching people geography in the hope that they will not want to travel the world. However, young people are part of the real world where they imitate the drinking habits of their adult counterparts, whose pattern of drinking is often much different to what they encourage. It seems that the leaning of public policy is to curtail the supply in order to reduce problems associated with illicit drugs. At the same time the availability of licit drugs, such as alcohol, is not only accepted but extensions to the hours of availability are encouraged by effective lobby groups, such as the drinks and tourism industries.

His third "paradox" is that in terms of reducing alcohol related problems, alcoholics may not be as significant a grouping as policy-makers may believe. This stems from the fact that alcoholics only constitute a small percentage of the total population, while a majority of the population drink alcohol. He argues that this majority will experience more alcohol related problems, although perhaps not of the same severity nor duration as alcoholics. So, he says, as a group they place higher costs on society than alcoholics, who have traditionally been the focus of prevention policies. This is not to say that alcoholics do not matter at all, but in terms of priorities they may demand less attention than moderate drinkers.

Saunder's fourth paradox extends the same argument to heavy drinkers, rather than alcoholics. Kreitman (1986) demonstrated that significant reductions in alcohol related problems are best achieved by targeting "social" drinkers, a group which has traditionally been ignored by health promotion messages. Investigating a problem titled "difficulties with work in association with alcohol" it was found that although the prevalence of the problem was most severe in the highest consuming group, the greatest number of problems was in the low and medium consuming groups (Crawford *et al.*, 1984). The fifth paradox is that the actions of Governments on alcohol problems may not be the most influential. This stems from the conjecture that at least some aspects of alcohol related health problems are probably best tackled at local community level. One example of this type of "people power" may be changing attitudes to drink driving, through community groups such as MADD (Mothers Against Drunk Driving).

The potential prevention paradoxes put forward by Saunders invite critical appraisal. His criticism's may be overstated, but they are worth consideration by policy makers. The validity of the first point about too little attention and resources being allocated to combating alcohol abuse, and by implication too much being attributed to illicit drugs, depends on the priorities of a society in allocating its scarce resources to preventive interventions. It may be true that current allocations in terms of per capita deaths are weighted more towards illicit drug use than licit drugs, like alcohol and cigarettes, but is this not a reflection of the relative concerns of society on these issue? It may be that these relative concerns are unbalanced in terms of the problems they impose on society. However, in order to verify this an assessment using a more illustrative indicator than morbidity rates, as used by Saunders, is required. It has been argued that Ireland has developed double standards in dealing with drug and alcohol problems and that a better public health policy would result if the focus was shifted from distinctions between licit and illicit drugs to distinction between drug use and drug abuse (Butler, 1984).

The focus on demand side measures when dealing with alcohol in comparison with the supply side approach taken with illicit drugs may follow from the historical experience of the effectiveness of alcohol supply curtailment, or prohibition, in reducing alcohol related problems. This is not encouraging. Indeed, curtailed availability of alcohol may lead to greater demand for dangerous alternative sources of intoxication. Curtailing supply of a commodity that a majority of the population consume, should only be advocated when the welfare gains to society are certain to compensate for over-riding individual preferences.

The other points raised by Saunders possibly have more validity, in that prevention should not be exclusively focused on the groups defined as alcoholics or heavy drinkers. However, the inclusion of "social" drinkers as a target group, while understandable, should not divert attention away from problem drinkers because this latter group are numerically less significant in the population. His last paradox about Government actions not being most influential is more an issue of the context in which prevention should take place. Government action, when deemed appropriate, could be used to facilitate or harness the community based approach advocated by Saunders. These should be viewed as complementary rather than as substitute activities for alcohol problem prevention. However, the empirical studies on local community initiatives are often equivocal in their findings. This can stem from the fact that an initiative often takes place in a community where extreme cases or consequences of alcohol abuse are occurring. So, for example, a superficial cross-sectional examination of the existence of MADD and the occurrence of drink driving accidents in US communities would show a positive relationship. Quite sophisticated analyses are required to sort out the causal from the spurious relationships. See, for example, McCarthy and Zibiak (1990), who deduced that MADD did have an effect on reducing accident frequency.

6.5: *Strategies for Alcohol Control*

The social response to alcohol problems fall into two main categories. One category of policies might be described as public control strategies, which include taxes, licensing laws and advertising restrictions. The other category of policies can be described as personal control policies, which include drink driving laws, minimum drinking age laws and provision of treatment. For an elaboration of these categorisations, see Bucholz and Robins (1989).

The approach to the problem of alcohol abuse that is put forward in this section requires the use of legislation to influence behaviour, the market to generate behavioural incentives and education to create positive attitudes. The primary emphasis of the control policy should be directed towards prevention. Programmes directed at prevention of alcohol related problems could have the following two objectives: first, a reduction in the availability of alcohol and secondly, a reduction in the demand for alcohol. These programmes could be focused at specific groups and perhaps be administered at a community level, but co-ordinated under a national alcohol policy.

The econometric analyses presented in Chapter 3 analysed several important factors influencing alcohol demand. These are other policy determinable variables, such as the number of sales outlets and the minimum drinking age, that could also be hypothesized to influence alcohol demand. However, Irish data cannot provide much evidence about these using econometric analysis, because they have largely been invariant over the period under review. However, studies abroad have considered these factors and an econometric model of alcoholism by Schweitzer, *et al.*, (1983) identified several policy variables to be significant determinants of

consumption, alcoholism and alcohol related mortality. The variables included the number of outlets, the minimum drinking age and advertising, as well as rates of taxation, which operate through prices.

Supply Side Policies

Commencing with the objective of reducing the availability of alcohol, there are a number of different options that might be employed:

(i) Controls on Production and Importation

The feasibility and suitability of this type of control is inappropriate in the Irish situation and in the context of this paper, but can be considered as a theoretical possibility; if only for completeness. Prohibition of alcohol production has been carried out in many countries, but while it has been very successful in reducing consumption and related problems, it also tends to create an illegal underground market that leads to inequitable allocation of resources and criminal violence. There is evidence of its success in the USSR where there was a dramatic 53 per cent reduction in alcohol production between 1984 and 1985 with reported declines of 30 per cent in absenteeism, 13.8 per cent in alcohol related traffic accidents, 26 per cent in alcohol related crimes and 11 per cent in alcohol related mortality (WHO, 1990a). Again, a liquor strike, which reduced production in Finland diminished arrests for public drunkenness among male adolescents by 20 per cent (Saila, 1987).

There is unlikely to be any great political will to introduce limitations on production, let alone prohibition in Ireland, nor would it be practical given our membership of the European Community's Single Market, because imports of alcohol could not be prohibited. Even the 48 hour rule that was in operation with regard to purchasing outside the Irish jurisdiction has been ruled to be against the spirit of the Community. All that might result could be a loss of employment in production and an increase in imports, without any reduction in consumption.

(ii) Control on Distribution

Throughout the world there are a great variety of legal regulations on the type of establishments that are permitted to sell alcohol. Their number, density, location and times of operation are strictly controlled. There has been much debate about the effectiveness of curtailing accessibility to alcohol. For example, in Poland in 1981, supply of alcohol was rationed, with Solidarity demanding that the alcohol retail network be reduced from 35,000 shops to 1,200 (Moskalewiez, 1981). Although at first this had a beneficial impact on alcohol related problems, illicit production increased subsequently to bring the drinking patterns back near their initial levels. Again, liberalisation of Finnish licensing laws increasing the number of outlets was associated with substantial increased consumption in the late 1960s

(Makela and Osterberg, 1976). Also an econometric model using data on 35 US states in 1975 indicated that a 10 per cent reduction in the number of on-premises outlets would reduce consumption by around 1 per cent (Schweitzer *et al.*, 1983).

The discussion of number of outlets raises the issue of vested interests. In many countries there are significant vested interests who would like to see availability of alcohol increased rather than curtailed and these groups can have important impacts. However, the converse vested interest can exist too and certainly does in Ireland, where publicans oppose increases in the number of outlets for alcohol, because they fear reductions in the values of their licensed premises. Indeed the protected position accorded to publicans by licensing restrictions is by no means a clear benefit to the public in terms of reducing alcohol consumption or abuses. For instance, the use of special exemptions to serve alcohol outside normal opening hours by licence holders has been steadily on the increase. A 1979 change in the legislation to include a requirement that a "substantial meal" be served at these times seem to have had little impact in reducing what many see as abuses of special exemptions. Although the initial impact was to reduce the amount of special exemptions, albeit by a very insignificant amount, they are getting more numerous each year as Table 6.3 demonstrates. The term "special" would seem to be ironic given their abundance.

Table 6.3: *Special Exemptions to the Licensing Laws*

Year	*Number of Special Exemptions*
1967	6,342
1972	14,814
1977	32,800
1979	42,111
1980	39,899
1981	37,061
1982	38,668
1983	38,036
1984	40,330
1985	43,606
1986	44,838
1987	45,904
1988	44,782
1989	46,832
1990	48,840

Source: CSO *Statistical Abstracts*, various issues.

Allegations of price-fixing are not unknown within the alcohol distribution sector, and while over-pricing alcoholic drinks could be considered a deterrent to alcohol abuse (which is not to say it is justified), over-pricing low alcohol beers or non-alcoholic drinks is another matter. Public houses in Ireland charge nearly as much, in some cases more, for low, or zero, alcohol beers. This despite the fact that

excise tax on these beers is far lower than for high alcohol beers. It could at least be argued that greater competition between publicans might end such practices. The arguments made by Hartley (1989), who examined the possible conflicts between competition policy and health promotion policy, are relevant. His emphasis on ensuring that potential competitors, be they producers or retailers, should be able to gain free entry to the markets could be crucial to the success of low alcohol beers. Extra licences might also reduce the distance between consumer and publican, reducing the temptation to drive when intending to drink. This would reinforce the anti-drink driving legislation and is something that might be expected to occur automatically in a free market without barriers to entry.

(iii) Minimum Drinking Age

Another instrument used to reduce accessibility to alcohol is the use of minimum drinking ages. In the UK, allowing supermarkets to sell alcohol was associated with a doubling of arrests for drunkenness among underage youths (Williams, 1975). Evidence from the USA, Canada and Australia, where recent changes in the minimum drinking age have occurred, suggest that adolescent involvement in fatal car crashes decrease significantly when drinking age is raised from 18 to 21 (Saffer and Grossman, 1987). Further confirmatory evidence is provided by Gordis (1991) and O'Malley and Wagenaar (1991). The latter authors not only found that higher minimum drinking ages lowered drinking and traffic accidents by teenagers, but that the reductions persisted into their 20s.

Demand Side Policies

Curtailment of alcohol supply will not be a fully effective policy option unless there is a corresponding curtailment in the demand for alcohol. A perhaps extreme example follows from a comparison of Bahrain and Iran. Both countries have total prohibition, but the demand for alcohol is still quite strong in Bahrain, due in part to Western influences, while in Iran, religious beliefs act to eliminate demand for alcohol. There are a number of mechanisms that can be used to curtail the demand for alcohol, which include:

(i) Price and Taxation Regulations

Prices can be a useful instrument in curtailing demand for alcohol. Real price rises will reduce alcohol consumption, but as was stated in Chapter 3 the price elasticity of overall alcohol consumption was estimated to be -0.45, while the income elasticity was estimated as 1.13. So if real income were to grow at 3 per cent per annum, which is a reasonable economic objective, then real prices would need to grow at 7.6 per cent just to keep consumption constant. This is assuming that the real price increase applies to all alcoholic drinks. Traditionally, alcohol has been treated as a demerit good with special taxes imposed on it in order to reduce consumption. There are two explanations for the use of special alcohol taxes; one

is that they provide a revenue source for Government and the other is that they act as a control instrument to reduce consumption. Taxes, in addition to raising revenue can in many cases lead to economic inefficiencies, or deadweight losses, by distorting the economic decisions of individuals. However, if the tax is corrective, that is if it attempts to correct prices to include the full social costs, then these deadweight losses may in fact be negligible; see, for example, Honohan and Irvine (1987).

Economic theory on optimal taxation suggests that taxes should fall most heavily on commodities that are inelastic in demand or supply. This is referred to as the Ramsey rule for minimising deadweight losses of taxation. The low price elasticity has been part of the justification for excise taxes on alcohol because it guarantees that the tax yields substantial revenue without substantial deadweight loses. However, the openness of the Irish economy and the potential for smuggling greatly reduces the scope for unilateral price increases via taxation. This is particularly so since the introduction of the EC Single Market and the move to tax harmonisation, a topic which will be returned to later in this chapter.

Some authors of papers in the alcohol policy literature seem to believe the responsiveness of alcohol consumption to price to be greater than the econometric evidence suggests. There may be undue reliance on findings from the USA (Cook and Tauchen, 1982; Cook, 1983), where real prices had declined substantially and where taxes on alcohol were lenient and where demand may have been more price elastic. For example, Wodak (1992) dismisses most of what he terms "preventive strategies" because there is "general agreement on the effectiveness of raising the price". It is true that some cross-sectional studies have reported higher price elasticities. Kendell *et al.* (1983) claimed that a study of drinkers in a particular Scotish locality between 1978 and 1981 showed higher price effects than income effects. Indeed, they found the income effects to be very low. However, findings in a particular region and a particular period of time may not be globally generalisable.

Disaggregating alcohol consumption into component drinks and considering influencing choice of drinks through pricing policy, leads to wider possibilities. Cross-price elasticities were found to be statistically significant and substantial, so that pricing policy may be reasonably effective in steering people to a particular type of drink. Drinkers do not generally opt for the cheapest form of alcohol; if they did there would be huge switches of drinks whenever relative prices per unit of alcohol shifted. People have their preferences, but price does influence choice. Although the econometric analysis of Chapter 3 could not separate out low alcohol beers, it is plausible that pricing policy could increase its relative share of consumption. While it might be expected that the moderate drinker might be more responsive to such measures than the problem drinker, there is some tentative evidence that even the latter category may successfully switch to low alcohol drinks (Long and Cohen, 1989).

Wine drinking merits some special remarks. Although it has a much smaller share of the alcohol market than beer or spirits, that share has been increasing rapidly and wine has the highest income elasticity of all. However, the own-price and cross-price elasticities were also high showing that taxes on wine might prove effective in holding back consumption. Obviously, some people would continue to purchase wine at the higher price, but analyses in Chapter 4 showed that wine, in particular, is a "higher" social group drink. So the extra taxes would, by and large, be paid by the better off, which is usually considered desirable from a welfare viewpoint. Interestingly, Richardson (1990) has called for increased excise tax on wine in Australia on the grounds that current excise levels favour it over beer and spirits and that a reduction in the share of wine would substantially lower the chemical alcohol consumption level.

The general issue of whether alcohol taxation is regressive rather than progressive in nature has been the subject of some study; see, for example, Ashton *et al.* (1989). The analyses of Chapter 4 showed that preferences for types of drinks varied between social classes and that a relatively lower excise tax on beer would favour progressivity. Whether these social group preferences extend to low alcohol beers is probably doubtful however.

The high excise tax on alcohol in Ireland probably stems more from its wide social acceptability and its administrative convenience, rather than from conscious consideration of the negative externalities associated with its abuse. Crain *et al.* (1977) claimed that the wide social acceptance of alcohol taxation, given that a majority of the population are drinkers, is still consistent with economic rationality. They argued that an individual may favour a sumptuary tax on a good he/she consumes if he/she believes it can help improve his/her welfare. For example, if an individual derives welfare from both alcohol consumption and from safe driving, then the higher is the price of liquor the less costly it is for him/herself to exercise moral restraint by remaining sober and driving safer. In addition the individual may also favour an alcohol tax that affects himself, if it discourages other consumers from drunk driving, so reducing the probability of an accident for all road users.

The excise duties on alcohol at present are specific taxes, set in nominal terms according to the physical quantity of the beverage. The administrative convenience of this duty is that it is levied at a uniform rate on drinks at the production stage. The administration and compliance costs are relatively small in comparison to the revenue collected. It has been recommended that alcohol taxes can be applied at differential rates to beverages, in relation to their harm content, in order improve society's welfare. See Holm and Suoniemi (1992) for an example using Finnish consumption data. The main disadvantage with excise duties set in nominal terms is that in order to maintain the real value of the tax, these duties would need to be revised each year in the Government's budget to take account of inflation.

The erratic manner in which the real excise duties in Ireland have been allowed to vary over the years creates uncertainty about future retail prices. The revalorised change in duties could be automatically accounted for by a move to an *ad valorem* tax, that is one expressed as a percentage of unit value. It has been argued that such a change would add certainty to how much tax is to be paid for both the consumer

and producer (O'Hagan, 1984). Alcohol producers and retailers, facing significant adjustment costs when retail prices are altered, usually combine the effect of duty increases along with other cost increases into a single price change. This can create a perception among consumers that there is over-shifting of the tax burden by the trade on to drinkers. Evidence on this pass-on of excise duties to consumers in the UK would seem to indicate that revalorised changes to excise duties are fully reflected in retail prices. However, with regard to real changes in excise duty the evidence suggests that less than full shifting on to the consumer occurs (Baker and Brechling, 1992).

A switch towards the use of *ad valorem* taxes which do not need constant adjustment to maintain the real value of taxation in inflationary times, could have conflicting effects. On the one hand, there has been a tendency for price of alcohol to lag behind disposable income, unless Governments change excise taxes from year to year (Bruun *et al.*, 1975). In the 1970s countries, like the USA, France and Germany which did not keep adjusting their excise rates, experienced sharp falls in the real price of alcohol and increases in consumption. So the change could reduce alcohol consumption, but there is a negative side too. An advantage of excise taxes are that they are levied on units of alcohol rather than on price, so there are untaxed elements such as the water component of beverages, which could encourage a trend to lighter beers and weaker spirits. Once again, however, the publicans pricing practices are relevant and it may be that this advantage has never been properly utilised.

Before closing this section, some of the practical constraints on pricing policies need to be reviewed. Chapter 3 examined how spirits sales were underestimated greatly in periods when the Republic's spirit's price was much higher than that holding in Northern Ireland. Independent price rises will fail to work beyond a certain point, because smuggling, as well as legitimate travel, will permit purchases at lower prices. In addition, the political will to increase these excise rates further, given the already high taxes levied on Irish drinkers, must be questioned. The trend would seem to have to be towards reducing these excise rates to comply with EC directives towards tax harmonisation within a Single European Market. New policy measures manipulating alcohol prices are obviously constrained and may only be feasible on a Community-wide, or co-ordinated, basis.

The Single European Act defines the internal market as an area without frontiers in which the free movements of goods, services and capital are ensured. In accomplishing this, fiscal barriers arising from different systems and levels of VAT and excise are to be modified. The Revenue Commissioners (1991) envisaged "a substantial alignment of excise systems and approximations of duty rates" as essential prerequisites for the completion of the internal market. This does not go as far as saying Ireland can no longer unilaterally vary excise taxes.

However, without border controls Irish taxes on alcohol cannot be maintained at far higher levels than the minimum ones, if other countries opt for minimum levels, without destroying the Irish retail business through transferring purchases outside the jurisdiction. Nor need this imply any reduction in alcohol consumption here, but rather a switch from beer to spirits as a more easily transportable drink.

Of course, if other countries also decided to raise their tax levels far above the minimum, the situation could be workable. But current differences in levels are so high that this possibility seems unlikely.

Table 6.4: *EC Member States' Excise Rates as Percentages of Irish Rates (1992)*

Country	*Beer*	*Spirits*	*Wine*
Belgium	15	58	13
Denmark	60	69	52
Germany	6	48	0
Greece	8	7	0
Spain	3	21	0
France	2	43	1
Ireland	100	100	100
Italy	20	28	20
Luxemburg	5	35	5
The Netherlands	17	53	17
Portugal	10	26	10
United Kingdom	69	106	69

Source: Department of Finance

As of the beginning of 1993 the member states of the EC have agreed to maintain excise duties above common minimum rates for each product category. Table 6.4 shows the position of excise rates in EC member states relative to those in Ireland as of 1992. Irish excise rates are by far the highest among the Community members, the UK's being the closest, and are well above the EC minimum rates. The Commission in the run-up to the Single Market had recommended "target" rates, which although not binding provide a level which member states may choose to move towards over time. Achieving these target rates would require the Irish Exchequer finding substantial alternative sources of revenue to replace lost excise tax. The UK would also require substantial alternative sources, which suggests that a long lead-in period, of perhaps a decade, may be needed for Irish and UK rates to coincide with the EC targets. In the long run Irish alcohol prices will probably need to move towards the European average because of market forces. So if prices are to be used as a mechanism to deter drinking, co-ordinated efforts to increase alcohol taxes throughout the Community are needed.

(ii) Information and Education

Providing the public with information about alcohol and the consequences of alcohol abuse has, of course, been suggested as a means to alter behaviour and to induce a reduction in the demand for alcohol. The role of the media is important in the dissemination of information on alcohol use. Studies have been undertaken in the USA on the content of advertisements in magazines and on television, and of

the portrayal of alcohol in television dramas and cinema. These studies suggest that alcohol use generally portrayed as being without negative consequences, in contrast to illicit drugs (Bucholz and Robins, 1989). There has, however, been a gradual shift, within the last two decades, to more negative images of alcohol use, particularly in recent cinema. It is reported that following changes in drink driving laws, decreases in subsequent drunk driving rates result as much from increased media attention as the legislative changes themselves. However, rates tend to revert back towards their pre-law change levels within a few months.

The mere provision of information is unlikely to have the desired impact on consumption, unless it forms part of a co-ordinated education campaign (WHO, 1985). Most industrialised countries have provided alcohol education for the general public, but also placed emphasis on special target groups. These target groups include school children, drinking drivers, pregnant women and people in occupations where the prevalence of alcohol abuse is considered a problem. The emphasis is on primary prevention through increasing knowledge and changing attitudes. Some countries, for example Switzerland, have introduced alcohol education in the school curricula. However, there is a growing concern that school based interventions have not been particularly effective, especially the more traditional didactic approach (Schaps, *et al.*, 1980). Newer approaches being tried in the USA, which have had limited success, include teaching peer refusal and social skills, and correcting perceptions of social norms (Howard *et al.*, 1988).

In order to achieve changes in attitudes and behaviour, the role of alcohol in the individuals lifestyle is, or should be, a central focus of alcohol education. This education on alcohol could be used as one element of a campaign promoting healthier living, so encouraging responsible drinking from a positive perspective. Education becomes more effective with interpersonal communication, so that resources could best be deployed at a community level (Robinson and Tether, 1986). Canada is a good example, where a successful national alcohol education plan was developed, which is based on community focused programmes.

(iii) Restrictions on Advertising

It has been argued that unlimited advertising of alcohol can counteract the educational efforts aimed at reducing demand for alcohol. It is a heavily debated point whether alcohol advertising increases overall consumption, but it certainly promotes a positive image of alcohol drinking, which is frequently depicted as glamorous and associated with high status characters (Grube and Morgan, 1990). Some evidence seems to suggest that most alcohol advertising is brand specific with producers attempting to gain market share (Ackoff and Emshoff, 1975), but having meagre effects on the overall level of consumption (Strickland, 1983). Lynn (1981) failed to find any significant effect of advertising between Ireland, where spirits commercials on TV are prohibited, and the UK, where no ban applies. Even the long-run impacts of advertising are not that substantial according to Van Iwaarden (1983), so it seems a ban on alcohol commercials might not have any direct impact on the overall use of alcohol.

Walsh (1980) offered a very credible scenario arising from the market structure of the alcohol industry as follows. The alcohol industry is dominated by a few large organisations who compete with each other for market share in a structure economists refer to as an oligopoly. Competitive advertising is used by these organisations to differentiate their drinks from their rivals' drinks in order to boost their sales at the expense of their competitors, not necessarily to increase total sales of the industry, which would require co-operation to engage in "industry advertising". These oligopolistic firms also use advertising for purposes other than to increase their sales. Some well established firms use extensive advertising expenditure as a barrier to entry to discourage potential entrants into the industry.

Advertising is also used to segment the market to allow the firms to create different brands for target groups, with pricing to capture what consumer surplus exists in order to increase profits. So advertising facilitates the industry in becoming more monopolistic than competitive. A feature of a monopoly is that it restricts output and increases prices, so a ban on advertising may be counter-productive in that the firms may turn to price cutting to compete against each other for market share, which would tend to increase consumption. Here, of course, the use of the word "counter-productive" is in the context of reducing alcohol abuse. It may be worth remembering that, if the moderate drinker suffers no ill effects from alcohol, monopolistic behaviour is definitely reducing his/her welfare.

In contrast to all of this Saffer (1991) examined data from 17 countries and claimed that advertising did affect consumption. He estimated that banning advertising on alcoholic drinks could reduce their consumption by over 10 per cent. Duffy (1987) found statistically significant effects of advertising, but the magnitudes of the effects were small. He re-investigated the topic (Duffy, 1991) but again found the effects, although real, were still small. Makowsky and Whitehead (1991) examined data for Saskatchewan in Canada where a 60 year ban on alcohol ended in 1983. They could not detect any effect on total alcohol sales, but found that the ending of the ban tended to increase beer sales and reduce spirit sales. The situation must be considered undecided. It would seem at least premature to suggest that bans or other restrictions on advertising would be effective in lowering alcohol consumption. However, the topic deserves research attention using Irish data.

Chapter 7

CONCLUDING REMARKS

These concluding remarks are not a comprehensive list of conclusions, let alone a set of recommendations on appropriate policy on alcohol. As has been mentioned throughout this paper, there are medical, psychological and sociological dimensions to the subject, so that recommendations on policy ought to be a matter for an interdisciplinary group. But even such a group faces great difficulties, because of data deficiencies and disagreement about causative mechanisms and even uncertainty about basic definitions. As mentioned in the previous chapter, relevant American bodies altered their definitions of alcoholism in 1992 following a two year study on its meaning in terms of current concepts. So the remarks that follow are limited in scope, but do make the points that struck us most forcefully during the study.

- In terms of international comparisons with other developed countries, Ireland does not have a particularly high alcohol consumption per adult. The average is below the medically recommended limit, although it is above it if adjustments are made for abstainers. But even then a reasonably small reduction in average consumption of about 8 per cent would correct this. Some international comparisons, that have employed expenditure per capita rather than chemical alcohol per capita or per adult, have given a misleading impression of high Irish figures because of accounting conventions differing between countries.

- If other things remain unchanged, such a reduction could be achieved through pricing policy, probably most easily by exploiting high cross-price elasticities to divert some consumption to lower alcohol drinks, combined with educational or informational campaigns. The existence of adequate competition between public houses may be a prerequisite for the success of pricing policies. Diverting consumption, rather than reducing it, should minimise the loss in welfare experienced by drinkers, since at least some of the utility associated with drinking derives from ancillary activities, or from the social value of public houses.

- Although alcohol production and retailing has an important role in the Irish economy, a reduction of the size mentioned above, or even of the 25 per cent being urged by the international health bodies (although they visualise these applying to higher average consumptions than that of Ireland), could save the State more in costs than would be forgone in revenue, at least if the Ledermann

hypothesis is valid. This supposes that reducing average consumption reduces the proportion of heavy or problem drinkers correspondingly, and that the costs increase with alcohol consumption.

- If reducing average consumption does not correspondingly reduce the consumption of heavy drinkers, or if heavy drinkers do not impose heavier costs than moderate drinkers, the foregoing caveats are invalid. In its simplest form the Ledermann hypothesis is probably untrue. Our analyses based on the Household Budget Survey do not support the idea of a homogeneous population of drinkers, but rather a set of populations with average consumption related to household characteristics. But this need not imply that a narrower Ledermann hypothesis could not hold within each population. However, if it does not hold then it is critically important to identify and target the problem groups. Many writers on alcohol policy still argue in what is essentially a Ledermann hypothesis framework, although an epidemiological approach to problem drinking that stresses the interaction of many factors has gained ground over recent decades. These approaches may not contradict, but it is not entirely clear that they do not.

- Earlier the words "if other things remain unchanged" were used. They will not remain unchanged, particularly since Ireland is part of the EC. Firstly, Irish incomes should rise towards the average EC level, so given that the income elasticity has been found to outweigh the price elasticities (assuming tastes, or preference remain unchanged), consumption can be expected to increase. Secondly, moves towards harmonisation of alcohol taxation will restrict the scope for independent pricing policies and could easily mean another stimulus to consumption growth. Thirdly, Irish tastes (for example, for wine drinking) will probably move towards the European norm, which currently corresponds to higher alcohol consumption. However, tastes have been changing, perhaps because of greater awareness of a healthier lifestyle, and there have been reductions in alcohol consumption in the developed countries over the last decade. The trend may continue so that the future European norm may imply lower alcohol consumption levels than at present. Two points seem important. First, Ireland should encourage EC-wide informational policies to further this trend. Secondly, other countries should be urged to raise alcohol taxes so that harmonisation does not mean a huge fall in Irish prices and so that pricing policies can retain potency.

- Other factors are changing too, besides those determined by EC membership. A number of factors, ranging from age to such household characteristics as location and social class, were found relevant to alcohol consumption. The proportion of abstainers among young people is falling and, unless balanced by a reduction in consumption by drinkers, implies higher average consumption in the future. This again supports the importance of educational

programmes. The variation in patterns of alcohol consumption with different household characteristics, described in Chapter 4, may help focus such programmes more effectively.

- Consideration of the medically recommended "safe" maximum drinking levels leads to the observation that throughout the high income countries people are drinking, on average, much more than these quantities. It could be claimed that people perceive themselves gaining as much satisfaction from drinking, or related activities, as outweigh the health effects, but it may also be that they either do not know, or do not believe, the "safe" limits. Lack of knowledge would be an indictment of previous educational measures, but lack of belief should not be discounted. There is great uncertainty about precise dose-response relationships as regards the detrimental effects of alcohol. It is our impression that the medical limits err on the "safe" side, on the supposition that people come to no harm if they drink much less than would actually be required to cause health damages. This wrong on two counts, the economic one is that people spend on alcohol from free choice because they believe they derive satisfaction or welfare from so doing. Reducing this welfare unnecessarily is harmful, especially if it is presented as being in the public good. The non-economic argument is that low limits may be disbelieved and help discredit the idea of reasonable limits. Establishing the facts in this matter is outside our competence and our impression may be quite wrong, but there still remains a credibility problem with these recommended limits.

- Finally, some comment on the role of legislative measures requires mention. Much of its scope is obvious, for example as regards minimum drinking age and drink driving, but it is its role in promoting, or rather not inhibiting, competition that also deserves attention. For example, it was argued earlier that low alcohol beers do not seem to be competitively priced and so measures to increase competition may be desirable, perhaps even extending to the issue of new alcohol licences. Overall legislative measures should be part of balanced policies on alcohol, that also employ pricing mechanisms and educational programmes.

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