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TECHNICAL REPORT

An Ex Ante Assessment of the Economic Impacts of EU Alcohol Policies

Edwin Horlings, Amanda Scoggins

Prepared for the European Commission

RAND EUROPE

The research described in this report was prepared for the European Commission.

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Published 2006 by the RAND Corporation
1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
1200 South Hayes Street, Arlington, VA 22202-5050
4570 Fifth Avenue, Suite 600, Pittsburgh, PA 15213-2612
Newtonweg 1, 2333 CP Leiden, The Netherlands
Westbrook Centre, Milton Road, Cambridge CB4 1YG, United Kingdom
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Preface

The European Commission, Directorate-General Health and Consumer Protection (DG SANCO) has asked RAND Europe to contribute to the Commission's impact assessment of a proposed Communication on alcohol policy. This Communication presents a comprehensive approach to combat the harmful effects of alcohol use in the European Union. RAND Europe has focused exclusively on the economic impacts of DG SANCO's options.

This report first examines the nature and extent of the problem posed by alcohol use in Europe, which provides the rationale and focus for the associated policy initiative. Next, we develop a conceptual approach that discusses how alcohol use is linked to macroeconomic development. This approach is then used to examine the future impacts of a successful alcohol policy on a number of macroeconomic aspects. The results of this examination are then applied to a comparison of the four policy options. We conclude with a chapter on monitoring and evaluation, and finally draw conclusions and formulate recommendations.

The primary audience for this report is DG Health and Consumer Protection of the European Commission, which is responsible for drafting the proposed Regulation. However, the report may also be of interest to the wide variety of stakeholders that are affected by the Communication, such as other DGs of the Commission (e.g. DG Enterprise, DG Justice, Freedom and Security, and DG Education and Culture), the alcoholic beverages industry, consumer associations, and special interest groups and consultancies specializing in alcohol policy.

This report is completed, and has been peer-reviewed in accordance with RAND's quality assurance standards (see http://www.rand.org/about/standards/). We would like to thank Maria Renstrom, and the participants in the Inter-Services Steering Group on 26 April 2006 for their useful comments and suggestions.

RAND Europe is an independent not-for-profit policy research organisation that serves the public interest by improving policymaking and informing public debate. For more information about RAND Europe or this document, please contact Edwin Horlings at horlings@rand.org, or at RAND Europe, Newtonweg 1, 2333 CP Leiden, The Netherlands.

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Executive summary

Introduction

The European Commission aims to put in place a comprehensive alcohol policy to combat the harmful effects of alcohol use in the European Union, especially with respect to the young. As with all major policy and expenditure proposals, this Communication requires an evidence-based ex ante impact assessment. The purpose of an ex ante impact assessment is to consider what will happen in the future if different policy options are adopted.

This report has two specific objectives: (1) an assessment of the current macroeconomic impacts of alcohol use and the likely future macroeconomic impacts of the proposed policy, and (2) an assessment of the current economic contribution of the alcohol industry and of the likely impacts of the proposed policy on the industry.

We first examine the nature and extent of the problem posed by alcohol use in the European Union. Next, we develop a conceptual approach that discusses how alcohol use is linked to macroeconomic development. This approach is then used to examine the future impacts of a successful alcohol policy on a number of macroeconomic aspects. The results of this examination are then applied to a comparison of the four policy options. Our report concludes with a chapter on monitoring and evaluation, and finally draws conclusions and formulates recommendations.

The problem of alcohol consumption

Alcohol consumption is linked to a host of severe problems in the European Union. The data seem to suggest that *on average* there is no real problem, because aggregate alcohol consumption is declining. There are at least two reasons to believe otherwise.

The harmful effects of alcohol use occur especially in the extreme ends of the distribution. Heavy and hazardous drinking account for only 15.5% of adults, but it still concerns 58 million Europeans. Cutting back heavy and extreme drinking is consequently the main challenge where use is concerned.

Youth drunkenness is on the rise in many Member States and alcoholic beverages are becoming more affordable and more easily available.

Alcohol use and harmful behaviour are related but different issues. Harmful effects can be attributed to the physical effects of drinking (a continuous effect), behavioural effects (an incidental effect), and external effects (effects on third parties).

The distinction between use and behaviour is crucial to an effective policy response to the harmful effects of alcohol use. Even though the two are intricately connected and policies generally affect both, the distinction is relevant to the sustainable impact of an alcohol policy. Responsible behaviour must become engrained in the behaviour of consumers for the impact of policy to become lasting or sustainable. A focus on use alone may produce short-term success that can only be sustained at high costs.

The economic importance of the alcohol industry

The alcohol industry is a large and elaborate industry with extensive forward and backward linkages. The value chain of alcohol production involves a host of economic activities. Any change in alcohol consumption will affect the manufacturers of alcoholic beverages as well as their suppliers and clients throughout the value chain.

The alcohol industry makes a modest contribution to the total economy of the EU25. The numbers concerned are, however, substantial and any change in economic performance will involve large amounts of money and a lot of jobs. The impact of a change in alcohol consumption on the economic performance of the alcohol industry will be felt more strongly in some nations than in others, most notably in the 10 Member States that produce and export most.

Assessing the impacts of alcohol policy

Stakeholder analysis shows that the most likely and influential supporters of a new alcohol policy are the central government, national institutes and organisations responsible for coordinating national activities in alcohol research, prevention and treatment, the criminal justice system and NGOs. The alcohol industry is the most likely opponent, even though its position will depend on the impact of the proposed policy on its (future) economic performance.

Labour

The impacts of a successful alcohol policy on productivity and competitiveness work mostly through labour input. National costing studies do overestimate the impact of absenteeism. Reducing absenteeism at work will raise output (although the marginal increase in output will be lower than that in labour input) but will lower average productivity. The same is more or less true for unemployment and premature mortality. Each is, however, subtly different:

- Absenteeism combines a loss of productivity with continued wage payments, thus raising the costs of production.
- Unemployment involves a social cost that is not balanced by an individual economic contribution, thus imposing a negative externality on (working) taxpayers.
- Premature mortality ends all individual and social costs and benefits that are related to the deceased and is often viewed from a lifetime rather than a short-term perspective.

What if alcohol-related absenteeism, truancy, unemployment, and underperformance at work decline? Every 1% increase in labour input will produce less than 1% increase in output and a decline in average labour productivity. A higher educational attainment will improve the average employment opportunities of students and the quality of labour input, in addition reducing unemployment as well as the psychosocial problems that may lead to alcohol abuse. The lower burden of absenteeism on wage costs and of unemployment on public expenditure and the tax burden improve the competitive position of industry. However, the macroeconomic impacts are not likely to be significant. The impacts may still involve several billion euros across the EU25, giving an alcohol policy absolute value even when it does not have a significant relative effect on growth rates, productivity or competitiveness.

Opportunity costs

Health care

Lower alcohol-related costs are unlikely to free resources for use outside the health care sector, given the existence of hospital waiting lists and constraints on health care capacity. A decline in alcohol-related health care would have little impact on the fixed costs of the health care industry. The internal savings due to a decline in the harmful effects of alcohol use are also unlikely to be

reallocated to health care R&D. The opportunity costs of alcohol-related morbidity and mortality relate mainly to the potential benefits of a reallocation of resources within the health care sector. One such benefit would occur as resources are shifted from treatment (dealing with current cases) to prevention (dealing with potential new cases). A far more important effect of the reduction in health care expenditure on alcohol-related deaths and diseases is that a shift in resources to the treatment of other diseases and to prevention helps improve the general health status of the labour force, thus adding to its efficiency.

Pensions

Population ageing is the main threat to the sustainability of European pension funds. A future reduction in the harmful effects of alcohol consumption may lower premature mortality and increase the number of people that reach retirement age. Alcohol users who die prematurely contribute to pensions funds but do not draw a pension. The likelihood of their death is, however, included in the calculation of pension premiums. The burden on pension funds will increase when premiums stay unchanged but alcohol-related deaths decline. However, the age distribution of alcohol-attributable deaths suggests that a significant proportion of premature mortality affects those who have contributed to pension savings for a relatively short period (up to the age of 44). This implies that in financial terms the proportion of pension premium that can be attributed to alcohol-related deaths is lower than was suggested in the above. Alcohol policy would consequently not have a very significant impact on the pension squeeze.

Crime

Law enforcement is a necessary evil, protecting society from crime and violence but at a high cost. A decline in the harmful effects of alcohol use would lead to an immediate saving through a reduction in property damage (assuming a fall in crime across all types of crime). The same decline would lead to lower prevention and insurance costs but with a lag. The money spent on law enforcement and the police on the effects of alcohol-related crime and violence would not fall immediately if at all if the harmful effects of alcohol use were to decline. These costs include high fixed costs that would be redirected to other crimes rather than reallocated to productive purposes.

Drink driving

A decline in drink driving and alcohol-related traffic accidents would truly free resources, albeit at the expense of the value added generated by car manufacturers, car repair companies, and rescue and emergency services. Time savings would yield economic gains mainly through the amount of time involved in transporting freight and other production-related transport.

An estimated inferred loss of Gross Domestic Product attributable to alcohol-related deaths and injuries in the EU produces fairly modest results. A 10% reduction in the number of deaths would liberate a mere €10 million in GDP losses. Injuries account for a larger proportion of immediate output losses with savings amounting to between €24 and €118 million depending on assumptions. The combined effect would then approximately amount to €34 to €128 million.

Insurance

A reduction in alcohol-related morbidity, mortality, traffic accidents, and crime will in time translate into lower insurance premium unless the specific risks had already been internalized. There will be a time lag between the realization of benefits and the decline in premiums, as insurers need robust evidence on levels of risk. If risks have not been internalized, all insured will benefit from a decline in alcohol-related risk, drinkers and non-drinkers alike. The macroeconomic impact is unlikely to be significant.

Taxation and public revenues

If all else remains the same, a 1% increase in excise duties lowers alcohol consumption by less than 1%. The impact of excises on consumption seems to be modest. There is, however, evidence to suggest that they are very effective with respect to heavy drinkers and young drinkers. Excises cannot, however, be the only instrument. A more comprehensive approach is necessary.

A rise in excise duties would cause total alcohol consumption to fall and public excise revenues to increase. Excise duties alone are not sufficient to achieve a sustained decline in alcohol use or an associated change in harmful behaviour, but they can be effective with respect to particular groups of consumers, most notably heavy drinkers and young drinkers. Since the impact on consumption would be entirely due to an artificial impulse –an increase in taxation– rather than a real impulse –changes in the costs structure or efficiency of alcohol production–, industry would incur a net loss.

Unrecorded alcohol consumption imposes a cost on society. Tax evasion imposes a negative externality: drinkers of illicit beverages contribute less to the social costs of alcohol use than drinkers of taxed beverages and the associated costs are imposed on society at large, drinkers and non-drinkers alike. Raising levels of excise taxation may cause a decline in alcohol consumption and an increase in revenues. However, in Member States with high levels of unrecorded consumption revenues may actually fall as consumers switch to illicit products. In addition, unrecorded consumption raises the costs of enforcement.

Monitoring and evaluation

As stated in the EC Impact Assessment Guidelines (SEC (2005) 8 June 2005) the road map for monitoring progress should "set measurable indicators to cover both the quality of outcomes and the implementation process, and define plans for evaluation."

Monitoring is a continuous function that uses the systematic collection of data on specified indicators to provide management and the main stakeholders of an ongoing development intervention with indicators of the extent of progress in the use of allocated funds. Establishing clear objectives and indicators is the first stage of putting in place a good quality monitoring system. The number of indicators should be small to facilitate the obtaining of data from the maximum number of Member States and to allow annual updating of data.

Evaluation is the systematic and objective assessment of an ongoing or completes project, programme, or policy, including its design, implementation and results. It should (1) assess the impact of each policy in the EU and at other levels (national and local); (2) assess the efficiency of resource use; and (3) assess how consistently and how well the policy interventions complement other relevant government, industry or community programmes, actions, and initiatives. A policy's impacts should be evaluated with respect to relevance, effectiveness and sustainability, efficiency, consistency, and acceptability.

Comparing the policy options

The Commission has identified four options for future alcohol policy:

No change: Policy decisions and initiatives will be left largely to Member States and stakeholders, while the EU continues to finance projects and networks, support research, facilitate exchange of best practice, and collect and disseminate information on alcohol consumption and harm, but does not coordinate activities across policy domains.

Coordination of activities at EU level: Similar to option 1, but the EU would encourage stakeholders throughout the European Union to undertake similar activities (e.g. self-regulation, common codes of conduct on commercial communication, exchange of best practice on interventions) and to hold Member States to their Treaty obligations.

A comprehensive strategy: Application of a wide variety of policy instruments (legislation, self-regulation, information and education campaigns, exchange of best practice, stakeholder involvement) across all relevant policy domains (internal market, taxation, transport, education, research and consumer policy). The strategy would focus on drink-driving, coordinated campaigns, protection of third parties, commercial communication, consumer information, and availability and prices.

Purely regulatory: Focus on the use of the policy instrument of regulation to achieve a decline in the harmful effects of alcohol use.

The four policy options currently exist only in principle. The impacts of a European communication on alcohol policy will depend on its details –most particularly on the operationalization of the proposed actions and initiatives– and on the preferences and choices of the main actors. Our comparison of the four policy options is consequently based on an understanding of the fundamental principles of each option and of the effectiveness and cost-effectiveness of the instruments that may be deployed.

The effectiveness and cost-effectiveness of policy instruments

The effectiveness of regulation and enforcement (the "hard" instruments) is generally high, while that of information, awareness, training and education (the "soft" instruments) is generally lower. The two categories are closer in terms of cost-effectiveness. The second "soft" instruments appear to be moderately to highly cost-effective in the areas of drink-driving, hazardous and harmful drinking, and families and children, but much less cost-effective in tackling the issues of violence and economic development.

The nature of each policy option

A first, high-level comparison of the four options suggests that:

- Option 1 will not result in a decline in the harmful effects of alcohol use.
- Option 2 will probably be a more efficient version of option 1, but without a structural improvement in alcohol policy.
- Option 3 is potentially the most efficient and effective approach in that it combines policies intended to lower alcohol use with activities aimed at behavioural change, although policies aimed at behavioural change are generally less (cost) effective.
- Option 4 will lower alcohol use through stricter regulation and enforcement, but that without a supporting information and education campaign, changes in use may not become engrained in consumer behaviour.

A comparison of the impacts of the four options across all policy domains related to macroeconomic and sectoral impacts resulted in an assessment of the marginal impact of options 2, 3, and 4 relative to the impacts of option 1.

On balance, *option 3* appears to provide more macroeconomic and sectoral benefits than the other two options. It combines "hard" and "soft" instruments, targeting the behavioural foundations of harmful drinking with the latter and reinforcing this with the (cost)effectiveness of the former. The macroeconomic impacts may not be significant relative to the size of the economy or the influence of other variables, but the amounts involved are still substantial. *Option 3* also performs better than the other options in the opportunities for synergy, even though *option 4* has a distinct advantage with respect to public revenues and its uses.

Option 4 presents a number of clear benefits, for example with respect to drink driving, health care, and public revenues. Its impact on productivity and competitiveness is somewhat positive,

while the regulatory option will most likely harm the alcohol industry and its supplying industries. *Option 2* is mainly a more efficient approach to the current set of policies and initiatives. Yet, our main conclusion is that option 3 dominates the other options.

CHAPTER 1 Introduction

1.1 The proposed policy

The European Commission aims to put in place a comprehensive alcohol policy to combat the harmful effects of alcohol use in the European Union, especially with respect to the young. DG Health and Consumer Protection is designing a Communication on alcohol policy that will give shape to this comprehensive policy. The proposed policy aims to reduce the harmful impacts of alcohol use, while preserving its beneficial economic and social value added. As with all major policy and expenditure proposals, this Communication requires an evidence-based ex ante impact assessment.

The Commission's general objective is "to reduce the health and social harm due to alcohol consumption and thereby contribute to higher productivity and a sustainable economic development in the EU in line with the objectives set out in the Lisbon Strategy." More specifically, this involves substantially reducing alcohol-related road fatalities and injuries; reducing under-age drinking, postponing the age at which young people start to drink, and reducing hazardous and harmful drinking among young people; reducing alcohol-related acute and chronic disorders; encouraging and supporting Member State efforts to reduce alcohol-related violence and harm in families and to create a safer drinking environment; and supporting Member State efforts to improve workers' health and safety and to ensure better protection of young people at work.

These objectives can be achieved through measures in the area of commercial communication, especially where it concerns exposure of the young, consumer information on the risks of alcohol use in different situations, cross-border trade and taxation, treatment and advice, and information on alcohol consumption and policy.

The impact assessment will examine four options:

No change in policy

Coordination of activities at EU level

A comprehensive strategy

A purely regulatory approach

The responsibility for the impact assessment lies with the European Commission. RAND Europe supports DG Health and Consumer Protection by making an assessment of the economic impacts of the proposed Communication. In our contribution we have strictly followed the EC Impact Assessment Guidelines (SEC (2005) 8 June 2005) in order to produce an independent report.

1.2 Objectives and scope

The most prominent criterion in the assessment of new policies is economic. Regulations impose costs and restrain or enable the behaviour of businesses and consumers in markets; the Commission and Member States propose to finance investment funds or awareness programmes; enforcement, monitoring and evaluation impose additional public costs; and so on. In short, all government action involves money and an impact assessment weighs the individual and social costs and benefits to see whether or not this money is spent wisely. The key question is if a proposed policy will return a net benefit to society.

Yet not all value is monetary. Policies must also be examined for their social, environmental and sustainability impacts. For example, are the benefits of a proposed policies distributed equally among income groups, do they raise or lower waste production and energy consumption, and do they help to offer future generations the same or, preferably, a higher quality of life?

An ex ante assessment of economic impacts does not necessarily mean that all effects have to be expressed in monetary terms. The assessment calls for an answer to three consecutive questions:

Which positive and negative effects may occur and how likely is it that they will?

Which actors will be affected or involved?

How high are the costs and benefits going to be?

The first two questions involve a balanced analysis of likely impacts and their distribution among stakeholders. Quantification, the third question, is to be attempted but can be highly problematic. Evidence is often scarce and statistics can be misleading as well as informative. Ex ante impact assessment requires an analysis of evidence that has not yet been created. Attribution or causality is often unclear in quantitative evidence: there may be a statistical relationship between two variables but this does not mean that all determinants have been included or that there really is a relationship. Some impacts are by definition linked to alcohol (e.g. alcohol poisoning), while other impacts can only be ascribed to alcohol use for a certain percentage. Finally, some efforts at quantification may be considered unethical, such as assigning a value to lost lives.

The main objective of this report is to support DG Health and Consumer Protection in its impact assessment of the Communication on alcohol policy. This support will consist of data collection and analysis relevant to the problem and of an analytical comparison of the policy options.

This report refers to a wide range of sources. One important source has been the peer-reviewed report by the Institute of Alcohol Studies (Anderson and Baumberg 2006) as it provides an extensive summary of available research and data. Where possible we have augmented their data with information from other sources.

The report has two specific objectives:

(1) An assessment of macroeconomic impacts

What is the current impact of alcohol use on Europe's competitiveness, productivity, loss of working days, and unemployment?

What is the likely impact of the different policy options proposed in the Commission's draft Communication on Europe's competitiveness, productivity, loss of working days, and unemployment?

(2) An assessment of impacts on the alcohol industry

What is the current contribution of the alcohol industry to employment, balance of trade and government revenues in the EU?

What is the likely impact of the different policy options proposed in the Commission's draft Communication on the industry's contribution to employment, balance of trade and government revenues in the EU?

The answers to these questions will be used as input into the qualitative and quantitative assessment of the impacts of the four options for the Communication on alcohol policy.

1.3 Structure of the report

This report first examines the nature and extent of the problem posed by alcohol use in the European Union, which provides the rationale and focus for the associated policy initiative. Next, we develop a conceptual approach that discusses how alcohol use is linked to macroeconomic development. This approach is then used to examine the future impacts of a successful alcohol policy on a number of macroeconomic aspects. The results of this examination are then applied to a comparison of the four policy options. Our report concludes with a chapter on monitoring and evaluation, and finally draws conclusions and formulates recommendations.

CHAPTER 2 The problem of alcohol consumption

Alcohol consumption is linked to a host of severe problems in the European Union. Alcohol is related to more than 60 different acute and chronic disorders, and is responsible for 11 percent of male premature death and disability after accounting for health benefits. Overall, alcohol is the third-leading risk factor for the EU disease burden after tobacco and obesity. It accounts for a significant proportion of traffic accidents, violence, and crime. And heavy drinking is said to lower productivity in the form of lost production due to employee absenteeism, unemployment, and premature mortality.[1] Finally, alcohol use reinforces and is reinforced by inequality: unemployment, poverty, and psychological problems (e.g. depression) encourage alcohol use and are themselves aggravated by alcohol use.

And yet, what is the real problem: alcohol use or behaviour? How is alcohol consumption developing and what are the costs it imposes on society? We first examine the development of total and per capita alcohol consumption. Next, we focus on the difference between average consumption and extremes in drinking. This relates particularly to heavy and hazardous drinking and to youth drinking. The third step in our analysis concerns the distinction between alcohol use and behaviour, two intricately related but different issues. Finally, we take a brief look at the outcome of national costing studies that measure the tangible and intangible social costs of alcohol use in the EU25.

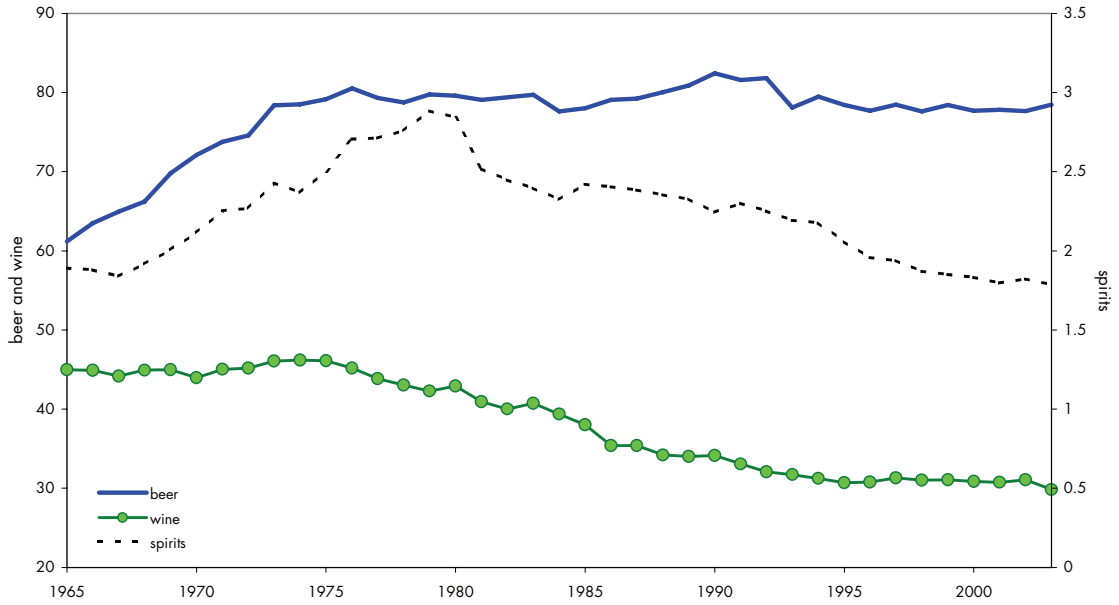
2.1 Trends in consumption

National data on the consumption of beer, wine and spirits can be extracted from *World Drink Trends* (2005), one of the most comprehensive sources of alcohol use statistics. The reliability of alcohol use data is always a point of contention (e.g. due to unrecorded consumption) and World Drink Trends is no more reliable than other similar sources, but this source provides easy access to long time series for a large set of countries.

We have used these data to chart the development of alcohol consumption from 1965 to 2003. The results are presented in Figure 1 and Figure 2. The trend in wine and spirits consumption is decidedly downward, showing a steady decline since the late 1970s. Beer, on the other hand, has reached a stable level. Aggregate alcohol consumption (in litres of pure alcohol) is also declining. Both per capita and total consumption had their peak in the late 1970s after which levels fell by about 20%.

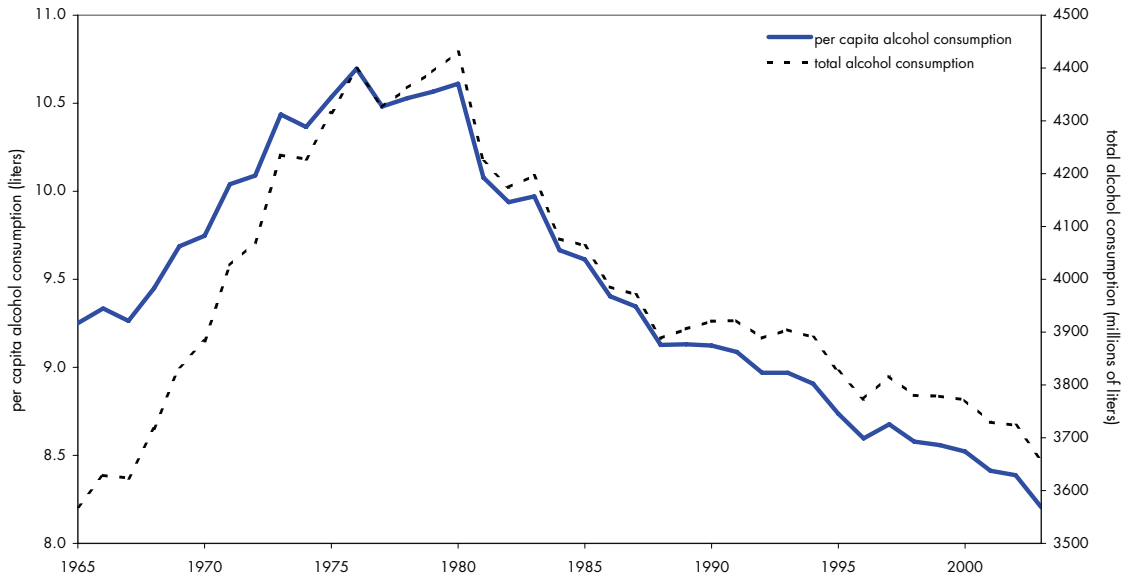
[1] See Anderson and Baumberg (2006) for a comprehensive overview of European evidence.

Figure 1. Average per capita consumption of beer, wine and spirits in the EU25, 1965-2003



Note: Estonia, Latvia, Lithuania and Malta were excluded from the calculations.
Source: World Drink Trends 2005.

Figure 2. Total and per capita pure alcohol consumption, 1965-2003

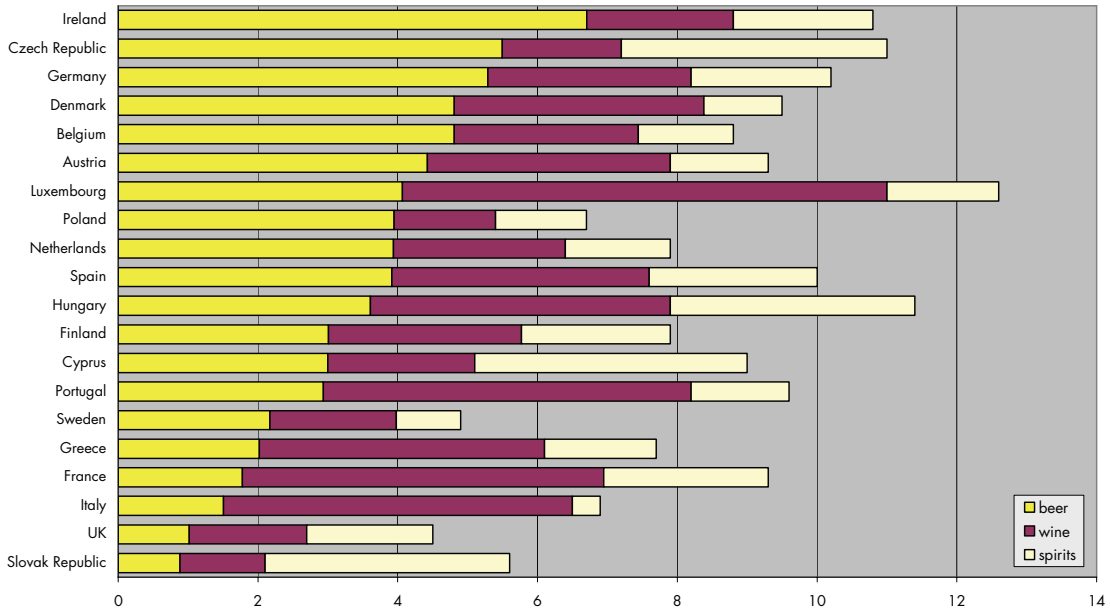


Note: Estonia, Latvia, Lithuania and Malta were excluded from the calculations.
Source: World Drink Trends 2005.

The countries of the European Union differ considerably in terms of the amount and composition of alcohol consumption. Figure 3 shows this variation. The countries have been ranked in order of beer consumption so as to reveal any patterns that may exist. Without going into too much detail, a few observations can be made:

- Luxembourg is a special case with a pattern of consumption that is presumably related to problems in the registration of cross-border trade in alcohol products.
- Most countries in the upper half have a comparable level of consumption with a different mix between the three types of beverage.
- The wine-producing countries of Portugal, Greece, France and Italy compensate their higher wine consumption with lower beer and spirits consumption.

Figure 3. The composition of alcohol consumption in the EU25, 2003 (litres of pure alcohol per person per year)



Source: World Drink Trends 2005.

An international comparison of levels of alcohol consumption is hampered by differences in the reliability of statistical data. Unrecorded consumption is the main issue. This includes local and home production of alcoholic beverages (e.g. microbreweries and home breweries) as well as illegal production, counterfeit products, and smuggling. For example, the WHO estimates that unrecorded consumption accounts for about one-third of alcohol consumption in Eastern Europe.[2] Table 1 summarizes data from two sources, showing the degree of variation between countries and the extent of the problem of unrecorded consumption in the new Member States. The data are insufficiently complete or reliable to make levels of consumption comparable across the EU25.

[2] "The most significant areas of counterfeiting and sales of unlabelled spirits are developing and transition countries, notably in Eastern Europe and the Asia-Pacific region, partly because such markets are characterized by low level of personal disposable income that render many legitimate and taxed spirits unaffordable." (ICAP 2006)

Table 1. Share of unrecorded consumption in total alcohol consumption (%)

	WHO	ICAP
Austria	7.4	6
Belgium	4.7	
Czech Republic	5.8	
Denmark		25
Estonia	33.7	71
Finland		20
Hungary	25.1	52
Latvia	42.9	66
Lithuania	28.5	35
Luxembourg	-6.0	
Netherlands		5
Poland	25.7	19
Slovakia	36.1	
Slovenia	16.6	39
Spain	7.5	

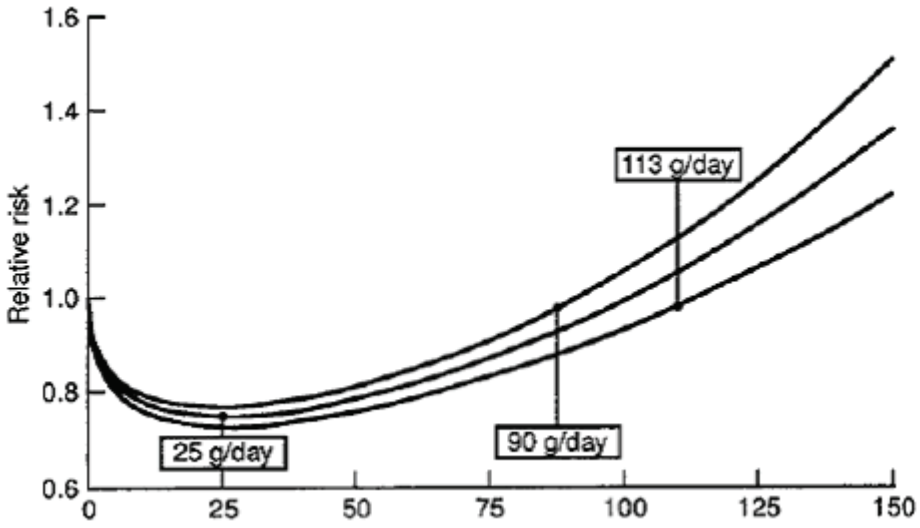
Sources: WHO 2004. International Center for Alcohol Policies 2006.

2.2 Averages and extremes

The data seem to suggest that *on average* there is no real problem, since alcohol consumption is declining. There are at least two reasons to believe otherwise.

The first reason is that the harmful effects of alcohol use occur especially in the extreme ends of the distribution. The famous U-curve (Figure 4) even suggests that moderate drinking is more beneficial than temperance. Recently, however, new evidence has been presented to suggest that the apparent benefits of moderate drinkers relative to abstainers is largely due to measurement errors. Fillmore et al. (2006) noted that the category of abstainers included "many people who had reduced or stopped drinking, a phenomenon associated with ageing and ill health". Where the authors did not find a measurement error, no significant benefits could be found. Anderson and Baumberg (2006) point out that below a certain age (35 for men, 45 for women) any level of alcohol consumption carries a mortality risk.

Figure 4. Dose-response relationships between reported alcohol consumption and the relative risk of coronary heart disease as measured in 51 studies



Source: Anderson (2005) reproduced from Corrao et al. (2000).

One crucial difference is that between average and extreme drinking. Although all alcohol use affects a drinker's health and excessive use may do considerable harm, reducing harmful effects is as much an issue of changing behaviour as of lowering use.

Averages can obscure actual problems: it is important to distinguish incidental excessive or binge drinking from continuous or dependent use. Data on the incidence of heavy and hazardous and of heavy episodic drinking in European countries (WHO 2004: Country Profiles) show that there are considerable differences among Member States and between men and women, but also that overall percentages of heavy drinking are fairly (or relatively) high. On the other hand, the definitions of heavy and hazardous drinking vary by country and the data are consequently not comparable.

The size distribution of adult drinkers by their level of consumption reveals that the vast majority is either abstainer or moderate drinker. Levels II and III account for only 15.5% of adults, although this still concerns 58 million Europeans. Cutting back heavy and extreme drinking is consequently the main challenge where use is concerned.

Table 2. Number of adults (16+ years) at different drinking levels in the EU25, 2001

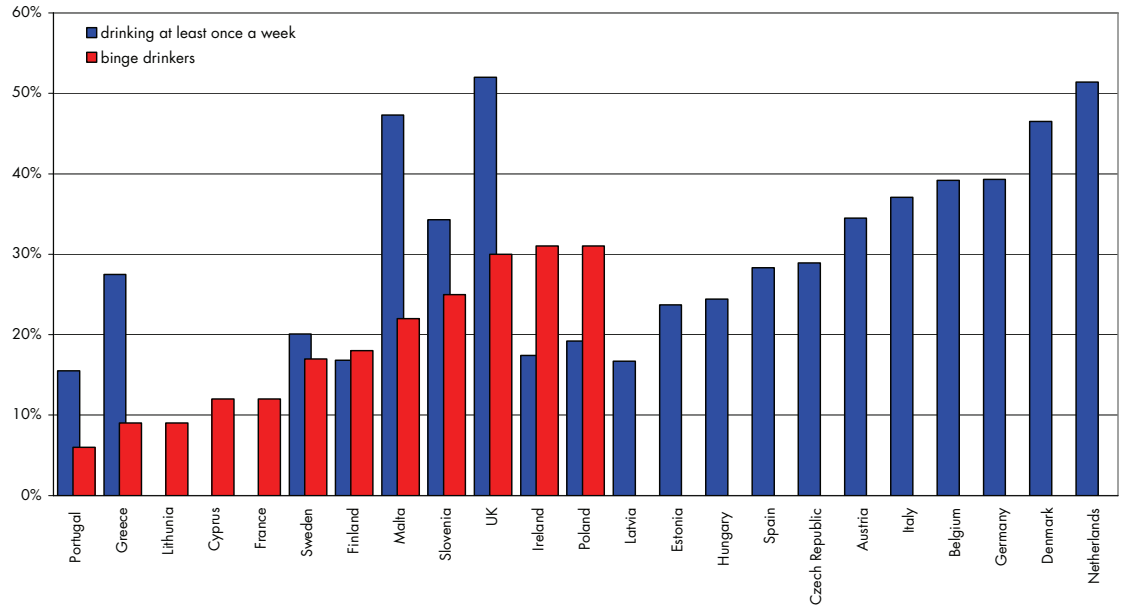
	definition (grams per day)		millions of
	men	women	adults
Abstinent	0	0	53
Level I	>0–40g	>0–20g	263
Level II	>40–60g	>20–40g	36
Level III	>60g	>40g	22

Source: Anderson and Baumberg 2005.

The second reason is that youth drunkenness is on the rise in many Member States and alcoholic beverages are becoming more affordable and more easily available. Figure 5 present statistics on the drinking behaviour of European youths. Overall, 20% to 30% of young people drink at least

once a week in most countries. More shocking is that binge drinking occurs fairly frequently, involving as many as 30% of young people in the UK, Ireland and Poland.

Figure 5. Patterns of alcohol use among young people in the EU25, 2004



Source: WHO Global Status Report on Alcohol 2004.

More extensive data on the drinking behaviour of boys and girls are presented in Table 3. These statistics show that boys drink more than girls, that binge drinking and drunkenness are fairly widespread (as many as 1 in 4 boys and 1 in 7 girls binge-drink at least 3 times per month) and that the problem is less severe in the Mediterranean countries and –to a lesser extent– the New Member States than in Northern and Central Europe. These data are, however, based on self-reporting and may suffer from problems related to that of unrecorded alcohol consumption, which is particularly high in the new Member States.

Table 3. Drunkenness and binge drinking among boys and girls in the EU25, 2003

	drunk 3 times or more in the last 30 days		binge drinking 3 times or more in the last 30 days	
	boys	girls	boys	girls
Scandinavia	**19**	**16**	**22**	**16**
Denmark	30	21	31	18
Finland	15	17	18	15
Sweden	12	9	18	14
UK and Ireland	**25**	**25**	**29**	**31**
Ireland	27	25	31	33
UK	22	25	26	29
Central Europe	**14**	**7**	**32**	**19**
Austria	22	11	•	•
Belgium	12	4	28	14
Germany	11	8	31	24
Netherlands	10	4	37	20
Mediterranean	**6**	**3**	**19**	**10**
Cyprus	6	1	17	6
France	5	2	13	7
Greece	3	3	14	8
Italy	9	3	19	8
Malta	7	4	32	19
Portugal	6	2	20	10
New Member States	**15**	**8**	**21**	**12**
Czech Republic	17	10	24	13
Estonia	23	13	26	15
Hungary	11	5	12	5
Latvia	12	7	24	18
Lithuania	17	8	19	7
Poland	13	5	17	5
Slovakia	14	8	20	12
Slovenia	16	8	23	18
Unweighted average	**14**	**9**	**23**	**14**

Source: ESPAD.

The danger of drinking among the young is that once a pattern emerges, it becomes more difficult to convince drinkers to change their behaviour. An Irish comparison between the drinking behaviour of occasional and regular drinkers reveals that as the intensity of drinking increases, the perceived health risk of the two groups diverges (Table 4). Regular drinkers grow accustomed to a higher level of alcohol use. The Irish study also revealed a remarkable difference between regular drinkers and occasional or non-drinkers concerning antisocial behaviour. Regular drinkers are roughly three times as likely to exhibit antisocial behaviour (e.g. theft or violence). (Health Promotion Agency 2005) There is therefore a link between use and behaviour, even though it is difficult to establish the relationship between cause and effect.

Table 4. Perceived risk of different drinking patterns by drinking behaviour

How dangerous is it to have:	Not at all	A little	Quite	Very	Don't know
1 or 2 drinks every day					
all	8	28	43	18	3
regular drinkers	12	32	38	14	3
occasional and non-drinkers	6	27	44	19	4
4 or 5 drinks every day					
all	2	8	28	60	3
regular drinkers	4	12	33	48	2
occasional and non-drinkers	2	6	26	64	3
5 or more drinks at the weekend					
all	6	19	31	41	4
regular drinkers	13	31	32	21	3
occasional and non-drinkers	4	15	30	47	5

Source: Health Promotion Agency 2005.

Alcohol consumption may be declining, but its harmful effects persist. This is a function of three features:

- Falling levels of consumption but a persistent problem of hazardous and heavy (or extreme) drinking.
- Growing consumption among the young.
- Persistent occurrence of irresponsible behaviour, that is, the combination of alcohol use with sensitive activities that may affect third parties, such as driving and working.

It is also useful to distinguish direct or immediate effects from indirect or delayed effects.

2.3 Consumption versus behaviour

Alcohol use and harmful or hazardous behaviour are related but different issues. Harmful effects can be divided into three categories:

Physical effects of drinking (a continuous effect)

Behavioural effects (an incidental effect)

Direct private versus external effects (effects on third parties)

All alcohol use has an impact on health, even in moderation. Modest alcohol use may have beneficial impacts on the health, quality of life and mental state of workers, although new evidence suggests that the observed health benefits are due to measurement errors.[3] (Fillmore et al. 2006)

Heavy drinking does not inevitably lead to harmful behavioural effects, such as accidents or antisocial behaviour. Some drinkers behave very sensibly, while many traffic accidents and acts of crime and violence are due to the innate abilities of the individuals: some people are simply bad drivers, poor students, inefficient workers, or have a propensity towards crime or violence. Irresponsible and antisocial behaviour are reinforced but not caused only by alcohol use. Theoretically, use can decline while the harmful effects of use stay constant (or vice versa) and, by

[3] There is an analogy between alcohol use and the use of other drugs where it concerns the direct impact on the quality of decision making; the potency of social acceptability and peer pressure; the addictive component; the distinction between use, problem use and addiction; and the sharp distinction between use reduction and harm reduction policies.

extension, some tangible costs can be reduced without changing use. For example, drink-driving may be reduced by raising awareness and enforcing compliance. Consumers can shift from incidental binge-drinking to a more regular use of alcohol, in both cases changing patterns of behaviour rather than levels of consumption.

Yet in practice, changes in tangible (and intangible) costs require a change in alcohol use. A policy that tackles drink-driving inevitably affects use and a policy aimed at reducing alcohol consumption inevitably has an impact on harmful behaviour. This is especially true for most health effects that are directly related to use.

Table 5 shows an example of the types of harmful effect alcohol use may have on a person's social functioning. The physical impacts of alcohol use are best recorded (e.g. the number of accidents or alcohol-related crimes), but the intangible social impacts can be most enduring. The loss of a job or a friend, a broken marriage, or a bad impression generally mean more to people than the loss of a car.

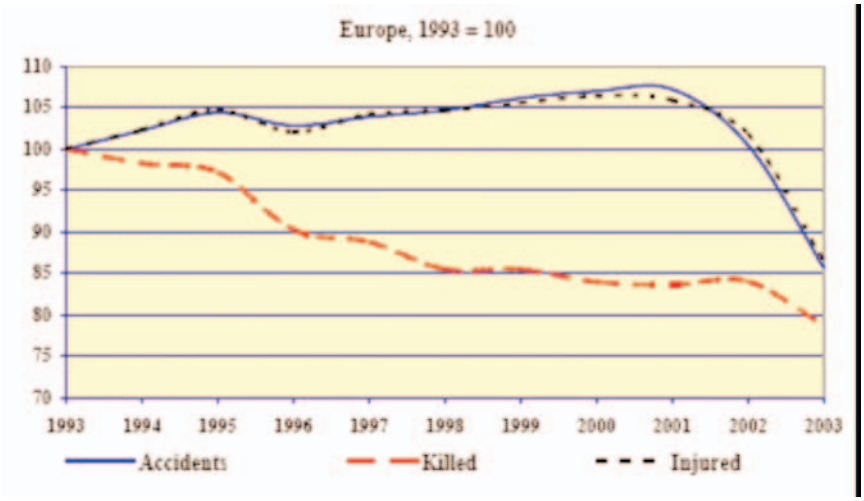
Table 5. Social or behavioural impacts of alcohol use during the last 12 months in 8 countries

	acute harm			social harm		
	regretted things said or done	**got into a fight**	**been in an accident**	**work or studies**	**home life or marriage**	**friendships**
Men						
Ireland	32	11.5	6.3	12.4	7.8	9.6
Finland	25.1	4.2	2.6	4.5	6.8	5.2
Sweden	25.8	1.3	3.5	3.0	1.9	0.6
Germany	7.2	5.5	0.5	3.3	3.0	1.6
UK	27.9	7.5	3.6	9.1	6.5	5.1
France	12.7	2.0	3.5	2.6	3.3	3.6
Italy	4.9	1.2	1.6	5.7	4.3	6.0
average	*17.3*	*3.6*	*2.6*	*4.7*	*4.3*	*3.7*
Women						
Ireland	21.7	2.8	2.4	2.9	1.3	4.3
Finland	17.0	1.4	0.8	2.1	2.5	2.6
Sweden	13.0	0.6	1.3	0.8	0.5	0.7
Germany	5.9	1.8	0.7	1.6	2.0	1.2
UK	21.5	3.6	3.4	4.1	4.5	5.1
France	4.4	0.0	0.4	0.4	0.2	1.3
Italy	3.6	0.2	0.2	1.7	1.3	2.3
average	*10.9*	*1.3*	*1.1*	*1.8*	*1.8*	*2.2*

Source: Ramstedt and Hope 2003.

This table underscores that alcohol use has many different effects. Alcohol use inflicts more acute and social harm in the UK and Ireland than in the other countries and affects men more than women. The tangible harmful effects can at least be monitored, making an efficient response easier. For example, statistics on the number of traffic accidents (Figure 6) show a steady decline, which can be attributed to innovations in car safety, other technological improvements in cars, and public campaigns and other measures for safer driving, including those aimed at drink-driving. Many intangible or social harmful effects are not as visible and therefore less easy to tackle.

Figure 6. Trend in road traffic accidents in Europe, 1993-2003



Source: Economic Commission for Europe, Statistics of Road Traffic Accidents in Europe and North America 2005.

The distinction between use and behaviour is crucial to an effective policy response to the harmful effects of alcohol use. Even though the two are intricately connected and policies generally affect both, the distinction is relevant to the sustainable impact of an alcohol policy. Responsible behaviour must become engrained in the behaviour of consumers for the impact of policy to become lasting or sustainable. A focus on use alone may produce short-term success that can only be sustained at high costs.

2.4 National costing studies

Many countries have performed costing studies to chart the tangible and intangible effects of alcohol use on society. Anderson and Baumberg (2006) have summarized the results to arrive at estimates of the impact of alcohol use on the European Union. Table 6 provides the outcome.

Table 6. The social costs of alcohol use in Europe, 2003 (€billions; average estimates)

Tangible costs	**125**	
health care	**22**	€17bn: treatment of alcohol-related ill health €5bn: treatment and prevention of harmful alcohol use and alcohol dependence
crime	**33**	€15bn : police, courts and prisons €12bn: crime prevention expenditure (burglar alarms) and insurance administration €6bn: property damage
traffic accidents	**10**	€10bn: property damage due to drink-driving
productivity	**23**	€9-19bn: lost productivity due to alcohol-attributable absenteeism €6-23bn: lost productivity due to alcohol-attributable unemployment
premature mortality	**36**	lost productive potential excluding health benefits
Intangible costs		
psychosocial and behavioural effects	**68**	
crime	**12**	victims' suffering
loss of healthy life	**258**	not including the victims of crime

Source: Anderson and Baumberg 2005.

The intangible costs are the most contentious part of the national costing studies in methodological terms, but they cover some of the most significant and long-lasting effects. They emphasize that harmful alcohol use also affects third parties, such as the victims of traffic accidents and crime, co-workers, family members and friends.

> "Many of the harms caused by alcohol are borne by people other than the drinker responsible. This includes 60,000 underweight births, as well as 16% of child abuse and neglect, and 5-9 million children in families adversely affected by alcohol. Alcohol also affects other adults, including an estimated 10,000 deaths in drink-driving accidents for people other than the drink-driver, with a substantial share of alcohol-attributable crime also likely to occur to others. Parts of the economic cost are also paid by other people or institutions, including much of the estimated €33bn due to crime, €17bn for healthcare systems, and €9bn-€19bn of absenteeism." (Anderson and Baumberg 2006)

One question to be answered in the development of a conceptual framework concerns the relevance of intangible costs to macroeconomic development.

CHAPTER 3 The economic importance of the alcohol industry

3.1 The value chain of the alcohol industry

The alcohol industry is an elaborate industry with extensive forward and backward linkages. The value chain of alcohol production involves a host of economic activities ranging from the production of basic inputs (e.g. hops, malt, and grapes), semi-manufactures (e.g. bottles) and supporting services (e.g. advertising) to outputs (e.g. wine, beer, spirits) and trade (retail, wholesale and catering) (see Text box 1). Any change in alcohol consumption will affect the manufacturers of alcoholic beverages as well as their suppliers and clients throughout the value chain.

Text box 1. Main economic activities directly or indirectly connected to the production of alcoholic beverages (NACE codes) [4]

Inputs: raw materials

A .1.11 - Growing of cereals and other crops n.e.c.

A .1.13 - Growing of fruit, nuts, beverage and spice crops

Inputs: semi-manufactures

DA.15.32 - Manufacture of fruit and vegetable juice

DA.15.83 - Manufacture of sugar

DA.15.92 - Production of ethyl alcohol from fermented materials [?]

DI.26.13 - Manufacture of hollow glass

DJ.28.21 - Manufacture of tanks, reservoirs and containers of metal

DJ.28.71 - Manufacture of steel drums and similar containers

DJ.28.72 - Manufacture of light metal packaging

DK.29.53 - Manufacture of machinery for food, beverage and tobacco processing

E .41.00 - Collection, purification and distribution of water

In addition, the industry requires office equipment and process control equipment and it purchases the services of the construction industry.

Inputs: services

DE.22.12 - Publishing of newspapers

[4] NACE: Nomenclature statistique des Activités économiques dans la Communauté Européenne.

DE.22.13 - Publishing of journals and periodicals
K .74.40 - Advertising

In addition, the industry requires transport services, rents machinery, demands insurance, banking, financial, and consulting services, and purchases electricity.

Manufacturing

DA.15.91 - Manufacture of distilled potable alcoholic beverages

DA.15.93 - Manufacture of wines

DA.15.94 - Manufacture of cider and other fruit wines

DA.15.95 - Manufacture of other non-distilled fermented beverages

DA.15.96 - Manufacture of beer

DA.15.97 - Manufacture of malt

Trade

G .51.11 - Agents involved in the sale of agricultural raw materials, live animals, textile raw materials and semi-finished goods

G .51.17 - Agents involved in the sale of food, beverages and tobacco

G .51.21 - Wholesale of grain, seeds and animal feeds

G .51.31 - Wholesale of fruit and vegetables

G .51.34 - Wholesale of alcoholic and other beverages

G .51.39 - Non-specialized wholesale of food, beverages and tobacco

G .52.11 - Retail sale in non-specialized stores with food, beverages or tobacco predominating

G .52.25 - Retail sale of alcoholic and other beverages

G .52.27 - Other retail sale of food, beverages and tobacco in specialized stores

H .55.30 – Restaurants

H .55.40 – Bars

H .55.50 - Canteens and catering

Substitutes and Complements

DA.15.86 - Processing of tea and coffee

DA.15.98 - Production of mineral waters and soft drinks

DA.16.00 - Manufacture of tobacco products

G .51.35 - Wholesale of tobacco products

G .52.26 - Retail sale of tobacco products

This group of activities also includes L .75.11 - General (overall) public service activities (for government excise revenues), N .85.00 - Health and social work, N .85.30 - Social work activities, and .92.10 - Motion picture and video activities and O .92.20 - Radio and television activities through K .74.40 – Advertising

3.2 The size of industry

The alcohol industry is a billion euro industry. Households in the EU25 annually spend about €95,000 million on alcoholic beverages, equal to 13.9% of total expenditure on foodstuffs and 1.6% of total consumer expenditure (Eurostat Online Database). This includes a considerable amount in excise taxation. For example, European consumer pay more than €10,000 million in excises on beer (Ernst & Young 2006). Detailed data on sectoral economics are regrettably scarce. To get an impression of the size of the industry in terms of employment and value added, we have summarized the available data below.

Value added

The contribution of an industry to Gross Domestic Product is its value added. Value added is equal to total turnover minus expenditure on inputs, such as raw materials, semi-manufactures, energy, and other goods and services purchased from other industries.

The value added of the beer industry, produced in breweries, is estimated at €12,000 million. In addition, €11,500 million is generated in the companies that supply the beer industry and €1,700 million is generated in retail (Ernst & Young 2006). We have information on the total production value of European vineyards. In the EU25, wine accounts for 5.4% of total agricultural production or €17,400 million. Assuming that the ratio of value added to output (the input-output ratio) of wine is the same as the average ratio for the entire agricultural sector (c. 50%), we can estimate value added at €8,700 million (EC 2006b). There are no data on the value added or turnover of the spirits industry. Assuming the same level of value added per worker as in the beer industry (€73,170 for the beer industry itself and €32,164 for the supplying industries) and the data on employment in Table 8, total value added in the spirits industry can be estimated at €11,700. The results are presented in Table 7 and set the total size of the alcohol industry at roughly €45 billion (23% of the food industry and 0.4% of EU25 GDP).

Table 7. Contribution of the alcoholic beverages industry to Gross Domestic Product, c. 2004 (€millions)

beer	breweries: 12,000 supplying industries: 11,500 retail: 1,700 **total: 25,200**	12.7% of food industry 0.24% of total GDP
wine	**total: 8,700**	4.4% of food industry 0.08% of total GDP
spirits	spirits industry: 3,659 supplying industries: 8,041 **total: 11,700**	
alcohol industry	45,600	
food industry	199,048	
total employment	10,421,644	

Source: Source: Eurostat online database. DG Agriculture.

Employment

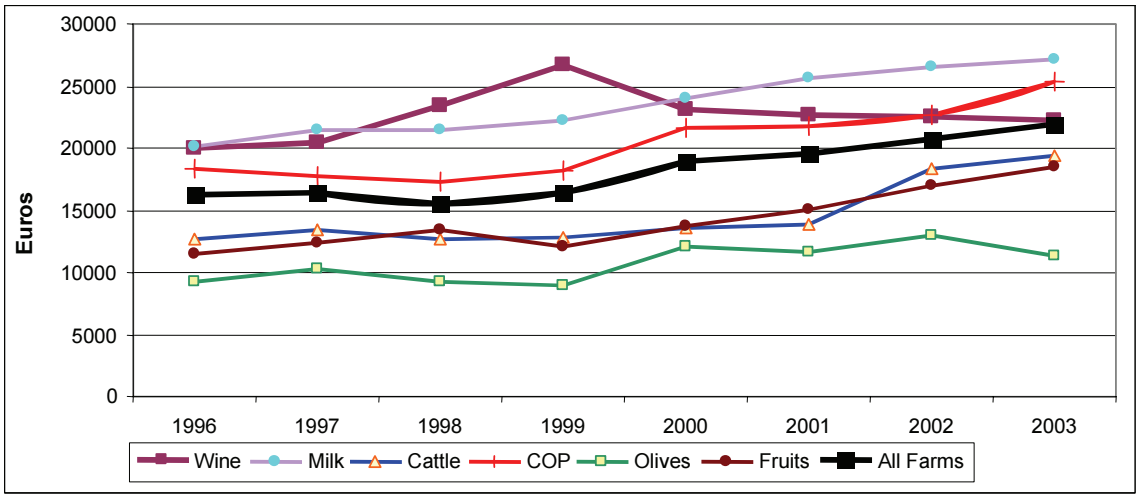
In 2004, European breweries directly employed a total of 164,000 workers and were indirectly responsible for 342,000 jobs in supplying industries of which 147,000 jobs in agriculture (Ernst & Young 2006). Spirits producers account for 50,000 workers in the industry itself and a further 250,000 in supplying industries (ICAP 2006). The size of employment in the wine industry is unknown. It is, however, possible to make a rough "guesstimate":

In 2003 value added per worker in the wine industry was about €22,500 (Figure 7).

We have estimated total value added in the EU25 at €8,700 million in 2004.

The combination of these numbers yields an estimate of c. 385,000 workers.

Figure 7. Net value added per unit of labour in different agricultural subsectors, 1996-2003



Source: EC DG Agriculture 2006.

Table 8 summarizes the available estimates of employment. The total comes to a minimum of 1.2 million jobs in the EU25. In addition, the beer industry claims responsibility for 2.6 million jobs in hotels, restaurants and cafes. (Ernst & Young 2006) Although there is undoubtedly a relation between the development of this segment of the labour market and the economic performance of the alcohol industry, these jobs involve more than the sale of alcoholic beverages and many people in the catering industry work part-time. A change in alcohol use can affect turnover and employment in hotels, restaurants, cafes, and other sectors of the catering industry. The actual impact will, however, be difficult to measure, since this industry provides more than alcoholic beverages. Changes in regulation (e.g. opening hours, outlet density) will have a clearer impact.

Table 8. Employment in the alcoholic beverages industry, c. 2004 (thousands of persons)

beer	breweries: 164 supplying industries: 342 **total: 506**	11.1% of food industry 0.3% of total employment
wine	**total: c. 385**	
spirits	distilleries: 50 supplying industries: 250 **total: 300**	6.6% of food industry 0.1% of total employment
alcohol industry	1,191	
food industry	4,553	
total employment	200,125	

Source: Source: Eurostat online database. ICAP 2006.

Regional distribution

Alcohol is consumed in comparable quantities across the European Union, but production is regionally concentrated. EU wine production is almost entirely concentrated in six Member States: France, Italy, Spain, Portugal, Germany, and Greece (Table 9). France, Italy and Spain

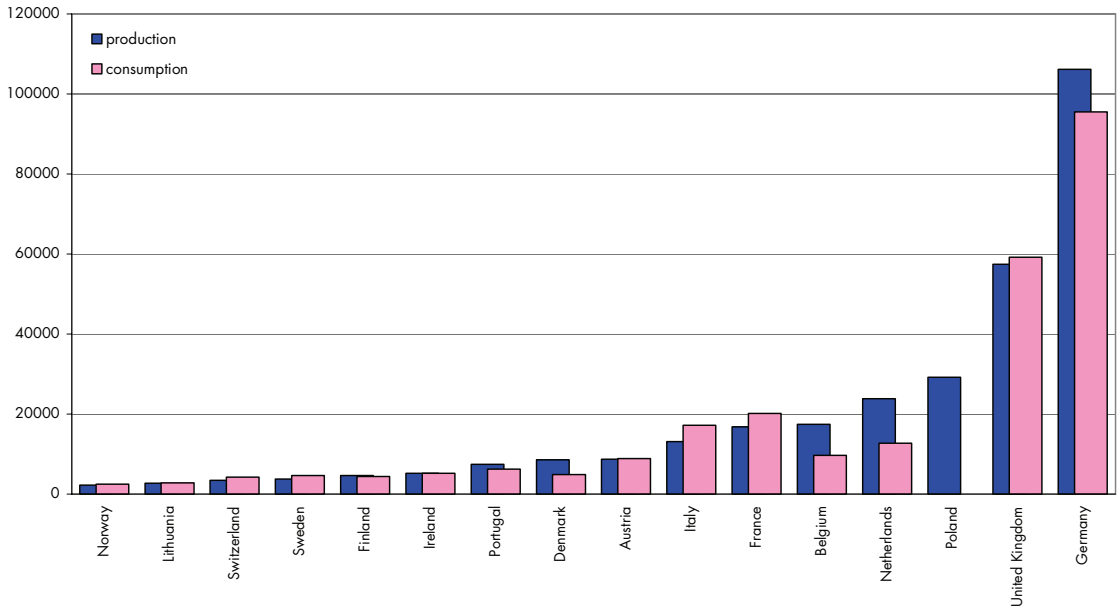
account for as much as 79% of vineyard acreage. Beer is produced in every Member State, but a few countries are Europe's major producers, viz. Germany, the United Kingdom, Poland, and the Netherlands. Belgium, France and Italy also produce considerable amounts (Figure 8).

Table 9. Share of wine CMO (common market organisation) expenditure and wine production per Member State (averages from 1989 to 2000)

	% of CMO expenditure	% of total European wine production	% of total table wine production	% of total quality wine production
Italy	40.46	34.41	46.27	18.17
Spain	29.97	18.54	19.45	18.50
France	22.83	33.26	25.09	39.78
Greece	3.17	2.26	3.55	0.50
Portugal	2.56	4.45	4.84	4.58
Germany	0.79	6.29	0.52	16.80

Source: EC 2002, Table 8.

Figure 8. Beer production and consumption in European countries, 2004 ('000 hl)



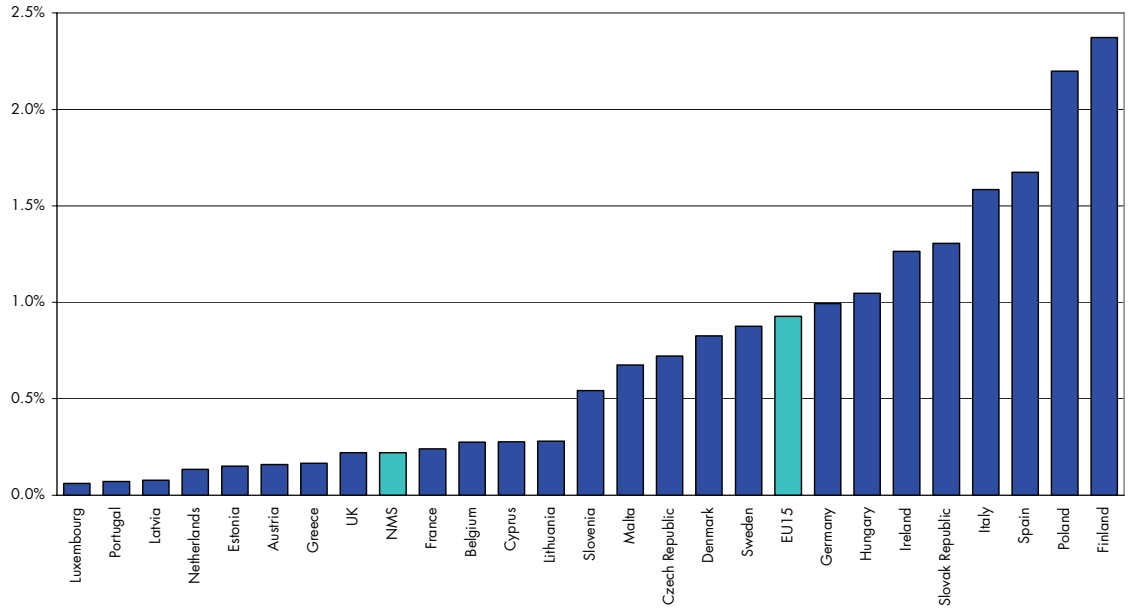
Source: Brewers of Europe [http://stats.brewersofeurope.org/stats_pages/employees.asp].

3.3 Trade

Exports of alcoholic beverages account for just under 1 percent of total exports in the EU15 and for 0.2 percent in the New Member States. Figure 9 shows that alcoholic beverages only contributed significantly more than 1% in 6 Member States, most notably in Poland and Finland.

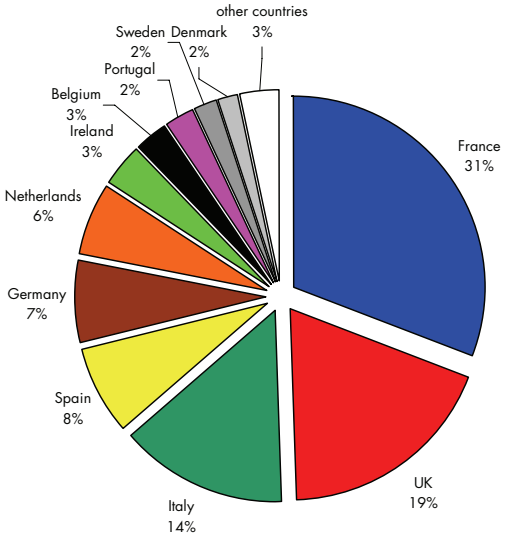
In terms of absolute value, six Member States stand out. France, the United Kingdom, Italy, Spain, Germany and the Netherlands are the EU25's main exporters of alcoholic beverages. Together they export €27.6 billion in beer, wine, spirits and other alcoholic products. This number does include intra-European trade (exports to other Member States).

Figure 9. Exports of alcoholic beverages as a percentage of the total value of exports, 2004 (%)



Source: COMTRADE database of the United Nations Statistics Division; International Trade Centre UNCTAD/WTO.

Figure 10. Share of Member States in EU25 exports of alcoholic beverages, 2004 (%)



Note: The trade figures include intra-EU exports.
Source: COMTRADE database of the United Nations Statistics Division; International Trade Centre UNCTAD/WTO.

Even the main exporters import a lot of alcohol. Table 10 presents national data on the balance of trade (exports minus imports). These data show that 9 of the 25 Member States had net exports in 2004 and that overall the EU25 exported more than $10 billion more than it imported.

Table 10. Balance of trade in alcoholic beverages, 2004 (thousands of dollars)

Austria	-184,093
Belgium	-528,017
Cyprus	-32,685
Czech Republic	-4,510
Denmark	-203,974
Estonia	-49,406
Finland	-207,881
France	**7,846,658**
Germany	-1,203,089
Greece	-217,452
Hungary	-11,258
Ireland	**513,514**
Italy	**3,259,173**
Latvia	-9,238
Lithuania	-46,385
Luxembourg	-143,143
Malta	-26,940
Netherlands	**634,433**
Poland	-71,022
Portugal	**469,626**
Slovak Republic	-47,844
Slovenia	**16,799**
Spain	**648,289**
Sweden	**26,222**
UK	**137,312**
EU25	*10,565,089*
EU15	*10,847,578*
NMS	*-282,489*

Note: Value of exports minus the value of imports. Net exporters in bold type.
Source: Source: COMTRADE database of the United Nations Statistics Division; International Trade Centre UNCTAD/WTO.

International trade is an important element of the performance of the alcohol industry, but domestic production and consumption seem to be dominant. With respect to beer the International Center for Alcohol Policies states:

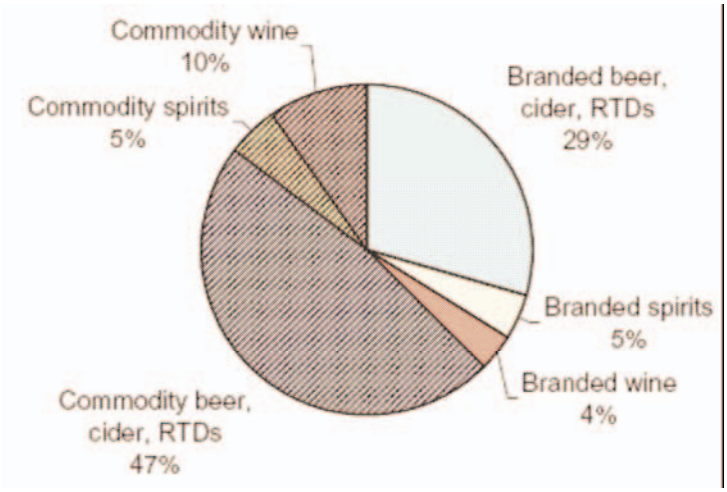
> "Although the largest global brewers have significant international production, their brands are essentially local. Due to its large volume, beer is generally produced in the country in which it is consumed. International brands, when available outside their "home" countries, are usually produced locally either by a brewery established by the brand owner or under license by a local brewery. Exports are important only for a few countries with prominent brands (e.g., Heineken, Carlsberg, Stella Artois or Guinness), which are produced by some of the world's largest brewing companies." (ICAP 2006)

The markets for spirits and wine are just as fragmented with many small and medium-sized producers and local products of varying prices.

The large majority of alcoholic beverages is produced by small domestic manufacturers, geared towards the local market and not traded internationally. These so-called "commodity" drinks constitute almost two-thirds of the volume of worldwide alcohol sales (Figure 11). The other market segment of "branded" beverages is dominated by large companies (e.g. Heineken,

Diageo). (ICAP 2006) This 'domestic bias' may mean that it will be difficult to offset a decline in EU levels of alcohol consumption with an increase in extra-European exports.

Figure 11. The composition of the volume of world alcohol sales, 2004 (%)



Source: ICAP 2006.

3.4 Indirect effects

The alcohol industry creates a lot of value added and employment through its backward and forward linkages. In the beer industry, the value of purchases from other sectors amounts to more than €20,000 million in the EU25 (Table 11).

Table 11. Expenditure by the beer industry on purchased goods and services, 2004 (€millions)

sector	purchases (€millions)	related jobs	
Agriculture	3,642	147,000	supplying raw materials
Utilities	785		
Packaging industry	3,149	38,000	manufacturing bottles, cans and fibreboard boxes for the alcohol drinks sector
Equipment	1,654	15,000	produce capital equipment for the beverage alcohol industry
Transport	2,064		
Media, marketing	2,710	3,000	people in advertising working on beverage alcohol accounts
Services	6,484		
Total purchases	20,488		

Source: Ernst & Young 2006.

Advertising expenditure is perhaps the most significant component of the industry's purchases. Worldwide, the vast majority of alcoholic beverages is not advertised. In developed economies, and particular among branded beverages, advertising is standard practice. Since overall alcohol consumption is fairly stable, if not declining, marketing serves to lure consumers away from competing brands and from other types of beverage (e.g. from beer to wine). (ICAP 2006)

A ban on or limitation of alcohol advertising is used as a policy instrument to lower alcohol use (for an example see Text box 2). American evidence suggests that restrictions on alcohol advertising can reduce motor vehicle fatalities and thus save lives. (Saffer 1997) The number of lives saved and the impact on the advertising industry depend on the specific policy. In a worst-case scenario (for the industry) it would cost €2.7 billion in turnover and 3,000 jobs.

Text box 2. Government gets tough on alcohol advertising (16 September 2004)

Eighty-five per cent of alcohol ads on TV will contravene proposed new rules according to Ofcom. Although magazine publishers will not be directly affected, they should be aware of this tough new advertising climate.

The new rules were prompted by consumer concerns over alcohol advertising which was appealing to children and teenagers. The Cabinet Office had also identified television advertising of alcoholic drinks as a target in its March strategy on alcohol harm reduction.

The "Youth appeal" factor dominated the review and the rule revision. Ofcom worked from previous research which indicated that alcohol advertising has some impact on young people's attitudes to alcohol (although less than family and social environment) and that a good deal of television advertising – of alcopops in particular – is closely aligned to youth culture and of strong interest to underage drinkers.

At a Forum on the new rules on 7 September, attended by PPA, alcopops were the focus of much concerned discussion. It appears that they are regarded by some sections of Government as having created a whole new generation of drinkers.

The draft rules are targeted at the following specific issues:

- Links between brands and anti-social or self-destructive behaviour, such as a promotion of abandonment as "cool."
- Linking alcohol with sexual success or attractiveness. The linkage being the key feature.
- Nutritional claims for alcohol, e.g. low carbohydrate.
- Suggestions that alcohol is essential to successful social events.
- Condoning the irresponsible handling or serving of alcohol.

The new rules take a detailed approach, as opposed to the old "spirit of the code" approach, which left more room for interpretation.

Source: Periodic Publishers Association – Legal and public affairs [http://www.ppa.co.uk/cgi-bin/go.pl/legal/article.html?uid=8812&topic_uid=2].

3.5 Conclusion

The alcohol industry makes a relative modest contribution to the total economy of the EU25. The absolute numbers are, however, significant and any change in economic performance – brought on, for example, by a change in the level of consumption– will involve large amounts of money and a lot of jobs. Moreover, the effects of such a change will be felt beyond the borders of the alcohol industry, which has creates employment and generates value added in a range of industries. Alcohol policies can directly impact on the performance of those industries, for example by imposing a ban on alcohol advertising (the media and marketing industry) or by restricting the number of outlets or opening hours (the retail and catering industries).

The impact of a change in alcohol consumption on the economic performance of the alcohol industry will be felt more strongly in some nations than in others, most notably in the 10 Member States that produce and export most, namely France, Italy, Spain, Portugal, Germany, Greece, the United Kingdom, Poland, and the Netherlands, and Belgium.

CHAPTER 4 Conceptual approach

4.1 The four challenges of ex ante impact assessment

Ex ante impact assessment is a complex issue. The quality of the results depends as much on the method used as on the specificity of the proposed policy, the multitude of actors or stakeholders involved, and the quality of the evidence on the current nature and direction of the problem that is targeted. Four challenges are particularly important.

Challenge 1: Achieving a comprehensive and evidence-based analysis of direct and indirect impacts

Policies affect individuals, regions, sectors, countries and supranational regions in different ways. Some impacts are direct (e.g. the costs of compliance with regulations), while many others are indirect (e.g. the impact on consumers of requirements imposed on producers). Impacts can be economic, social, environmental as well as relating to sustainability; they refer to the present (the current problem) and the future under different scenarios; and they include synergies and trade-offs with other policy areas. The challenge is to be comprehensive without being exhaustive, to cover all the bases necessary for an impact assessment, and to support the analysis of the impacts with evidence.

Challenge 2: Predicting individual and group behaviour

Three challenges will have to be met in order to determine the impacts that new policies, regulations, and expenditure programmes may have in the future:

Some impacts will derive directly from the policy, but the greater part will emerge from adjustments in the behaviour of stakeholders. For example, introducing a deposit on tin cans may persuade more people to return their cans rather than throw them in the garbage. The *first challenge* is therefore to gauge the future response of different groups of stakeholders to changes in their environment, notably with respect to their primary incentives.

Where the response of individual types of stakeholder can perhaps be considered fairly predictable, it is exponentially more difficult to assess the response of *all* stakeholders together. Given its main motivations or incentives, we can predict how a single brewery will respond to changes in regulation, but the dynamics will change when we consider the response of all breweries together. The landscape becomes even thornier when the assessment turns to the combined response of breweries, consumers, regulators, retailers, and other parties. The *second challenge* is therefore to capture the complexity of a policy area in an integrated impact assessment across stakeholders.

The dynamics of emerging and rapidly evolving policy domains include the rise of new stakeholders, whose incentives have yet to be determined. The complexity and uncertainty of such domains further complicate the impact assessment, because new

stakeholders can alter the relationships among all stakeholders. The *third challenge* is to measure the future changes in behaviour of all existing and potentially new stakeholders and their social, economic, environmental and sustainability impacts.

Macroeconomic analysis concerns group behaviour, but in our search for evidence we will frequently have to turn to studies of individual behaviour or the microeconomic level.

Challenge 3: The effectiveness of instruments

The impacts of the Communication on alcohol policy will depend on the way in which its objectives are translated into practical policy measures and instruments and the extent to which this results in a change in the behaviour of consumers, producers, and governments.

The Commission has three types of implementation mechanism at its disposal:

Regulations and Directives or Rule Setting:

Laws and Regulations: environmental legislation, taxation, intellectual property rights, mandatory "green" procurement

Voluntary Standards: emission trading systems, green labelling, voluntary individual agreements, performance standards, environmental management systems

Rewards and Incentives or Financing:

Direct Subsidies to Projects: institutional funds, programme funds, project funds

Supply of Capital: government loans, government co-investment, public-private ventures

Financial Incentives: loan guarantees, tax incentives

Communication and Coordination or Facilitating:

Knowledge Management, Networking: broker services, clearinghouse for information, consulting services, networking instruments

Participatory Instruments: national procurement centre, public-private partnerships (pilot projects)

The first two methods of implementation are considered "hard" instruments, whereas the third is seen as a "soft" instrument. We expect that assessing the impacts of the third group of methods will be more difficult, mainly because stakeholder response is more difficult to gauge. Our assessment will include a brief look at the effectiveness of as yet unspecific policies on a long timescale. This assessment will unavoidably be tentative given that the various options have not yet been fleshed out in detail.

Challenge 4: Quantifying and monetizing impacts

In impact assessment quantitative evidence is often considered superior to qualitative evidence, because it makes it possible to assign a specific magnitude to an impact. Since most, if not all, policies, spending programmes, and action plans involve money, it is equally important to express the impacts in monetary terms. In ex ante impact assessment the challenge is to carefully predict (or forecast) future impacts, and to support quantification and monetization with sound information (e.g. from theory and previous studies) and reliable statistics. Indicating the nature and direction of effects generally takes precedence over quantifying or monetizing the impacts.

4.2 How alcohol use affects macroeconomic performance

In its report for the Commission (Anderson and Baumberg 2006), the Institute of Alcohol Studies has collected and summarized the results of national costing studies on the effects of alcohol use. The various types of cost have been scaled up to the level of the EU25 and monetized in order to make the results more meaningful to policy makers and other readers. The tangible and intangible costs measured in costing studies are often compared to Gross Domestic Product (GDP) and it is tempting to assume that the economic impacts of a policy are linear to those costs. This would suggest, for example, that a 10% reduction in the harmful effects of alcohol use would lower costs by 10%, add the same amount to GDP and, hence, to productivity. This section explains how alcohol use theoretically affects four key issues –total output, productivity, opportunity costs, competitiveness– and why national costing studies may provide data but do not offer a good foothold for macroeconomic analysis.

4.2.1 Total output

The estimates of the costs of alcohol use presented in national costing studies are often compared to gross domestic product (GDP) to provide an indication of their order of magnitude. This implies that a reduction in alcohol use will lead to a linear decline in costs, liberating resources and adding to GDP. However, there is a fundamental difference between national costing estimates and macroeconomic impacts.

Quantification on a macroeconomic scale generally uses the concepts of the System of National Accounts (SNA). The SNA has two distinct advantages. First, it includes all of a country's inhabitants and not just a select group and it measures all components of production, income and expenditure. And second, the SNA is an international standard that is used to produce comparable statistical data. The accounting practices of the SNA are, however, more restrictive in that they only cover tangible items. There are some experiments to include intangible items, such as social capital and intangible assets, but these have not yet been integrated into the System. The measurement of growth, productivity and competitiveness –three key issues in macroeconomic analysis– consequently only concerns tangible costs.

The harmful effects of human behaviour are captured implicitly, for example through their impact on labour productivity. However, according to some (e.g. Daly and Cobb 1989) the SNA also measures such harmful effects in a perverse manner: crime boost law enforcement, soil pollution creates business for environmental cleaning companies, and alcohol use creates more work for health care providers. In addition, the wage costs of absent workers are included in national income and the sale of alcoholic beverages adds to national expenditure.

4.2.2 Productivity

Productivity is the core concept of macroeconomic analysis. It represents the efficiency with which the factors of production (labour, land, capital, knowledge) are combined to produce goods and services. The outcome in any sector or production process depends on the relative amounts of each production factor (particularly, the capital/labour ratio), on the quality of the inputs (e.g. human capital rather than mere labour; state-of-the-art capital equipment versus obsolete technology), and on the way in which entrepreneurs combine them in a production process (e.g. new business models).

Usually, economic analysis focuses on labour productivity or the amount of value added per unit of labour. Per capita Gross Domestic Product is the standard indicator for economic performance among policy makers, although economists tend to favour GDP per man-hour to account for differences in participation rates and working hours. A more complete approach involves the

calculation of total factor productivity or TFP.[5] A common way to express the relationship between output and production factors is the Cobb-Douglas production function.

$$Y = L^{\alpha} K^{\beta} \varepsilon$$

where Y is output or value added, L is the amount of labour input, K is the amount of capital input, α and β are coefficients that denote the relative importance of labour and capital in the production process (the sum of α and β is 1 under constant returns to scale), and ε is a general term that captures productivity as well as all other residual effects (including measurement errors). The relationship between total output or value added and the use of production factors consequently involves the quantity and quality of labour, the quantity and quality of capital, the ratio of capital to labour and the efficiency of production.

How does alcohol use affect productivity? Alcohol has three distinct effects, the significance of which is naturally conditional upon the amount of alcohol consumed:

(1) Use itself inflicts physical damage (e.g. disease) on drinkers and poor health has an adverse effect on productivity (when the employee in question still works) or output (when the employee is absent or becomes unemployed).

(2) When under the influence of alcohol, it alters the behaviour of drinkers and diminishes their capacity to perform complex (or even simple) tasks.

(3) Alcohol use has an impact on third parties, such as family members or co-workers.

How do these effects influence the quality and quantity of labour and capital used to produce output?

The most obvious macroeconomic category to experience the harmful effects of alcohol use is labour, that is, those who drink and the third parties affected by the behaviour of drinkers. Alcohol can have three types of impact on labour:

(1) Lower efficiency when at work, both as individuals and when functioning within a group

Drinking or having a hangover at work is generally associated with negative impacts. Alcohol use can have a psychological effect on co-workers, undermining process efficiency, trust, and labour productivity. In addition, drinking at work can lead to mistakes and accidents that cause damage or otherwise disrupt the production process.[6]

Social capital is a key concept: interpersonal relations, networks, or cooperation and coordination among employees create positive externalities that produce economies of scale in the production process: "the productivity of a given actor depends on the human and physical capital stocks of others". Trust is central to social capital: "trust may be understood as an optimistic expectation or belief regarding other agents' behavior". (Durlauff and Fafchamps 2004; Dasgupta 2002) Moreover, hazardous or heavy drinking has a greater effect on personalized trust (the personal interactions among workers), which takes time to establish, than on generalized trust (general knowledge or expectations with regard to agents), which is instantaneous.

From a more practical business perspective, alcohol use can guide entrepreneurial decisions. Problematic drinking among managers can undermine the quality of entrepreneurship. And when alcohol use at work becomes a pattern and workers are considered less reliable in general,

[5] Alternative terms are multifactor productivity (MFP) or joint factor productivity (JFP).

[6] In some settings, such as among Japanese salary men, drinking is used as a social lubricant, making a positive contribution to productivity. On aggregate, however, the impact on productivity is negative.

entrepreneurs can decide to replace labour with capital, adding to unemployment but raising the capital/labour ratio and, hence, productivity.

(2) Lower quality of worker ability due to poor health or a deficient education

Alcohol use can have an effect on human capital development when youth drinking negatively influences educational attainment (graduation rates as well as school performance) and the skill level of new entrants on the labour market with potentially long-term effects. A long-term effect on productivity of policies that target youth drinking assumes a link between truancy (absenteeism at school), school performance, skills, and productivity. Lower degrees of truancy would translate into higher average skills of school graduates, adding to the skills of the labour force.

(3) Loss of workers (lowering the quantity of labour input), permanently due to death, temporarily due to illness and absenteeism, or either temporarily or permanently due to unemployment

Alcohol use undermines the health of workers, diminishes their capacity for complex tasks either directly (when drinking at work) or indirectly (a hangover on a working day), and can affect their social interaction with other workers. Heavy or hazardous drinking among employees raises the likelihood of illness and absenteeism and in extreme cases results in workers being fired or dying prematurely. The performance of workers and their entry into and exit from the labour market have an impact on output and productivity.

The work of absent workers will generally still be done. However, large companies are in a much better position to cover for absent workers than SMEs where a single worker is more likely to be indispensable. A reduction in absenteeism will lower wage costs as a percentage of value added and raise revenues as absent workers produce additional output. But the increase in output and the reduction in wage costs are lower than the percentage reduction in absenteeism due to diminishing marginal returns to labour.

4.2.3 Opportunity costs

There is no evidence to suggest that drinking at work damages capital goods (e.g. machinery or equipment) to such an extent that it has a significant impact on output or productivity. This lack of evidence may be attributed to a disincentive among workers and employers to admit that alcohol played a part in accidents at work. When workers cause damage or disrupt production because they are drunk or hung over, they are unlikely to admit to drinking for fear of losing their job. Employers are unlikely to attribute an accident to alcohol use among their employees, because this would give their insurance company a reason not to pay. The same disincentive may affect the measurement of alcohol-related absenteeism and unemployment. The only notable exception concerns the damage to transport equipment (e.g. trucks, trains, ships) due to alcohol-related accidents that require new investments and disrupt the functioning of critical infrastructures (e.g. blockage of roads after accidents).[7]

A vastly more important effect concerns opportunity costs. Resources allocated to dealing with the harmful effects of alcohol use may entail opportunity costs: the money spent on alcohol-related health care, traffic accidents, crime, and other effects might be used more productively elsewhere in the economy.

National costing studies may give a good indication of the amount of resources involved, but this amount is not a good indication of the level of opportunity costs. First, the costs associated with alcohol-related diseases, violence and other crime, traffic accidents, or unemployment involve

[7] Damage to items of consumer expenditure (such as cars) does not have an impact on capital as a production factor but does divert household resources from alternative goods and services.

fixed and variable costs and (at least initially) only the variable costs would be lowered. And second, with the exception of traffic accidents, the public services that are involved (health care, social security, law enforcement) have a consistent lack of capacity or surplus demand. Resources might instead be reallocated to alternative uses within the public sector, perhaps with a higher social utility (e.g. cancer treatment, petty crime or drug abuse).

Following the components included in national costing studies, possible opportunity costs concern expenditure on:

- Health care
- Law enforcement
- Traffic accidents
- Insurance
- Pension funds

4.2.4 Competitiveness

Productivity is the key to competitive strength. Higher productivity involves:

Costs: Higher output per unit of inputs and substituting capital for skilled labour by embedding skills into new technology translates into lower costs per unit of output.

Volume: Raising the efficiency of the production process in combination with lowering costs provides companies the ability to supply the market with more goods and services.

Quality: A more efficient production process, using more advanced technologies, high-grade inputs, and high-skilled workers allows a company to produce goods or services of a higher quality than its competitors.

Alcohol use affects competitiveness through productivity by lowering the quality and efficiency of the work of alcohol-using employees and by raising wage costs per unit of output as absent workers do not produce but have to be paid regardless. In addition, an attractive business environment requires investments (e.g. in broadband) and an acceptable regulatory and fiscal burden. Additional alcohol-induced unemployment can raise the fiscal burden on businesses as social security expenditure rises. And the tangible costs of alcohol use (health care, law enforcement, et cetera) may crowd out public investments in the business infrastructure.

CHAPTER 5 Assessing the impacts of alcohol policy

5.1 What if?

The purpose of an ex ante impact assessment is to consider what will happen in the future if different policy options are adopted. In a more complex intervention such as the subject of this analysis, this requires first of all a basic understanding of the mechanisms that underlie the various areas affected by the policy. In short, what will be the impact of a successful alcohol policy in the areas of health care, crime, drink driving, productivity and competitiveness, and taxation and public revenues?

It is extremely difficult to assign a precise number to such impacts, mainly because the precise policy actions are as yet undefined and the response of stakeholders-individually and collectively, current and future - is difficult to predict. Where possible we have tried to estimate the extent of impacts, but generally an indication of the nature and direction of effects will have to suffice. In Chapter 6 we will combine all the information in order to assess the four policy options as a whole and to compare them.

5.2 Stakeholders

Stakeholder analysis is used to create a better understanding of the behaviour, intentions, interrelations and interests of the actors (individuals and organisations) and to assess the influence they have on decision-making and implementation processes. (Varvasovzky and Brugha 2000) This stakeholder analysis is aimed at identifying actors in the domain of alcohol policy. We briefly outline the role of actors, their level of influence, their position on policies to reduce the incidence of alcohol problems, and their likely response to a decline in alcohol consumption.

A previous stakeholder analysis of alcohol policy in Hungary was used to inform the current analysis, even though Hungary may be a special case. (Varvasovszky and McKee 1998) The stakeholder analysis in Hungary found the policy arena was relatively fragmented and the actors lacked coherent goals and a shared vision. Furthermore, the actors did not seem to be aware of what they could do as a result of their position. There was a failure to develop strategic alliances. Actors with high and medium levels of support and interest in a comprehensive alcohol policy, which would attempt to control overall consumption, had little influence. Those with influence in the policy arena have not mobilised themselves as regards public health in general and alcohol-related policy in particular, albeit with a few notable exceptions. Considerable opposition was expected from those working in the retail and catering industries.

Table 12. Stakeholder characteristics around alcohol policy

Stakeholders	Role or interest of different actors in alcohol policy	Position of actors on a policy to reduce the harmful effects of alcohol use	Influence of alcohol policy actors	Stakeholder response with decline in alcohol use
Ministries, governmental organisations and their representatives	Develop alcohol policies that are not specific to an institution or that involve legislation or regulation. Government ministries may have overlapping and/or conflicting interests.	Support	High	Each Ministry will react differently depending on its own priorities. Reallocation of resources to other policy areas.
Local government	Develop locally relevant policies that may differ from those at the national level within the limits of existing legislation. i.e. Meet central requirements and increase local revenues	Not mobilised	Low	Reallocation of resources
National institutes, organisations dealing with alcohol-related issues and their representatives	Coordinates national activities in alcohol research, prevention and treatment. Often do research concerning alcohol policy and interested in raising public awareness of alcohol-related problems	Support	Medium	No change.
Criminal justice system (police, judiciary, etc).	Play a significant role in interpretation of the relevant legislation and in resource allocation with regard to enforcement of a policy or dealing with breaches of a policy.	Support	Medium	Reallocation of resources to other policy areas.
Non-governmental organisations	Active participants in consultation pertaining to proposed legislation, serve as commentators on existing policies and their enforcement, or provide background information in support of existing policies or for a change in policy. NGOs, such as the WHO, help solve alcohol problems and raise public awareness of alcohol-related problems and fundraising activities.	Support	Medium	No change.
Alcohol industry: drinks producers (wine/beer/spirits)	Interest in maintaining or increasing sales volume, and protecting quality, decreasing tax, or decreasing illegal production.	Opposed to measures that hurt profits. Supportive of measures that place the burden of reducing harm on other actors.	Medium	Introduce new beverages. Increase marketing activities. Prices likely to decline as customer demand declines.
Alcohol drinks: wholesalers and retailers, pubs, clubs, hospitality industry	Stake in alcohol policies that may enhance or impede their business, and seek to play a central role in influencing (lobbying) policy proposals that are seen to have an impact on their work.	Opposed to measures that hurt profits. Supportive of measures that place the burden of reducing harm on other actors.	Medium	More intense marketing to increase sales volume. Extend opening hours to increase revenues.
Consumers (individuals and families)	Consumers have their own choices about what, where and how responsibly they drink. They have to accept that there are consequences for	Not mobilised	Low as individuals. High as a group.	No change.

	themselves and for others.			
Third parties	Many of the positive and adverse effects caused by alcohol are borne by people other than the drinker responsible (e.g. children and family members, underweight babies, victims of drink-driving accidents).	Not mobilised	Low	No change.
Insurance companies	Health insurers, for example, can provide companies and individuals with comprehensive health benefits that include customized treatment for alcohol use disorders. Insurers can help their clients reduce health care costs and ensure a healthy and productive workforce. Car insurance protects drivers from other driver's drink-driving behaviour.	Not mobilised	Medium	In the long term insurance premiums may fall as alcohol-related risks decline.
Media/Advertising industry	Gain revenue from alcohol advertising and promotion, setting agendas with regard to alcohol policies and framing debate about emerging policy topics. Media can also have a mixed role to play in reinforcing community awareness of the problems associated with alcohol.	Opposed to measures that restrict business and undermine profits.	High	Increase in business as competition soars in a declining market. Negative impact when advertising is banned.
Health care industry (local GP, hospital in-patient and out-patient services, mental health care services, A&E, self-help groups, e.g. alcoholics anonymous)	Interested in health related issues including health promotion, prevention, treatment and problems related to alcohol.	Support	Low	Reallocation of resources.
Experts in health and safety	Often asked to contribute to the policy development process and are also at times involved in the assessment and evaluation of impacts of policies.	Support	Low	No change.

The most likely and influential supporters of a new alcohol policy are the central government, national institutes and organisations responsible for coordinating national activities in alcohol research, prevention and treatment, the criminal justice system and NGOs. The alcohol industry (involving activities along the entire value chain) is the most likely opponent, even though its position will depend on the impact of the proposed policy on its (future) economic performance.[8]

5.3 Productivity and competitiveness

The impacts of a successful alcohol policy on productivity and competitiveness work mostly through labour input. It has, however, proven extremely difficult to estimate the impact of

[8] Stakeholders are not necessarily pro or anti any given policy. They often take an unambiguous position to individual issues. But around complex sets of issues, such as alcohol policy, stakeholders align themselves depending on the nature of the policy and on their perspective. For example, the opponents and supporters of a policy will be different from a public health perspective than from a business or tax revenue perspective.

alcohol use on productivity and the estimates presented in national costing studies are tentative at best. The available estimates are presented in Table 13. Although the estimates are fairly consistent –with the exception of such figures as the costs of absenteeism in Ireland, Slovakia, and Sweden– the big question is what they mean. Do the estimates in the national costing studies give an indication of the impact of a successful alcohol policy? What if absenteeism and unemployment were to decline by, say, 10%?

Table 13. The social costs of alcohol with respect to work and productivity (‰ of GDP)

		lost productivity from loss of life	absenteeism	unemployment
Belgium	1999	4.7	<0.1	2.3
Denmark	1996	1.7	0.4-0.5	
Finland	1990	6.5-10.3	0.5-0.6	
France	1997	4.4-6.5	0.4-0.5	
Germany	1995	3.7	0.8	
Ireland	2003		7.8	
Italy	1994	1.3-1.6	1.7-1.8	
Netherlands	2000		<0.1	2.4
Portugal	1995	0.9	<0.1	
Slovak Republic	1994	5.4	6.6	12.1
Slovenia	2002	2.6	0.1	
Spain	1998		1.4	
Sweden	1998	9.6	7.1	
Scotland	2001-2		0.9	1.3
England and Wales	2001	2.6	2.0	2.4
EU mean		*3.9*	*1.6*	*1.5*
EU minimum		*2.6*	*1.0*	*0.6*
EU maximum		*6.5*	*2.0*	*2.4*

Source: Anderson and Baumberg 2005.

Labour input

National costing studies overestimate the impact of absenteeism. These studies generally assign an average level of productivity (value added or GDP per worker) to estimate what absent employees could have produced if they had turned up for work. However, the real impact is lower for a number of reasons.

Output will increase as much as is suggested in national costing studies only under conditions of full employment. (NEI 1996) Companies generally have a degree of "slack" in capacity. For example, other employees can take over the tasks of an absent worker, especially in larger companies, and work may be done in projects rather than days so that a one-day delay can be regained later. The more indispensable a worker is –either for his knowledge or because his company is small– and the more regular or time-dependent his work is, the bigger will be the impact of absenteeism.

Output is a function of production capacity (capital stock and equipment, organisation of the company, total workforce and its skills). Additional workers will not contribute to total output in linear fashion due to diminishing marginal returns to labour. One additional unit of labour will contribute less than one unit of output. The marginal revenue product of labour (generally equal to wage) depends on the quantity of labour, the quality of labour, employment propensity and duration, and the incentives to form and use human capital. In addition, this product will be higher in an SME than in a large company.

Additional workers lower average labour productivity and average total factor productivity as the amount of capital stays constant, the amount of labour increases, and the efficiency of the additional (alcohol-using) workers may be lower than that of average workers. The moral fibre and skills of alcohol-using employees is an ethical issue that will not be discussed in this report.

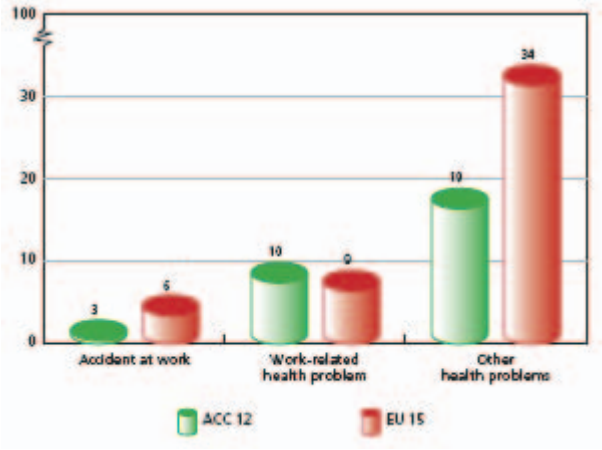
In short, reducing absenteeism at work will raise output (although the marginal increase in output will be lower than that in labour input) but will lower average productivity. National costing studies consequently overestimate the impact of absenteeism. In addition, we expect the impact of absenteeism to be higher on SMEs than on large companies. In the long run a decline in absenteeism may have a more significant structural impact as companies benefit from a larger pool of reliable workers and its stock of social capital improves.

The same is more or less true for unemployment and premature mortality. A decline in unemployment generates the same effects as a decline in absenteeism: a rise in output but a decline in average productivity. The quality of (formerly) unemployed workers is a delicate subject, but a valid distinction is that between workers who lost their jobs due to economic circumstances beyond their control (e.g. an economic depression in their sector) and those who lost their job as a result of purely individual reasons, such as incompetence, improper behaviour or the obsolescence of their skills. The argument with respect to premature mortality is more or less similar. There is an extensive literature on the value of life, but this mainly deals with the loss of income attributable to a premature death or severe injury. (e.g. Viscusi and Aldy 2003)

One key factor ignored in national costing studies concerns selection bias: problem use is to some extent correlated with ability, education, social background, social pressure, stress, and other external factors. An aggregate estimate of risk (such as total social costs) misses the fact that distributional impacts (e.g. alcoholism as a public health problem among the poor and unemployed) can be significant. The problem with alcohol is not premature mortality as such, but rather the increase in the variance of mortality. Compared to others, drinkers tend to die fairly young or long past retirement after expensive illness. Those who die young deprive society of their lifetime productivity, while those who die old tend to consume medical resources (e.g. for end-stage renal disease) that would be far more productive (in terms of DALYs or per capita GDP) when applied to, for example, low birth weight babies or obesity.

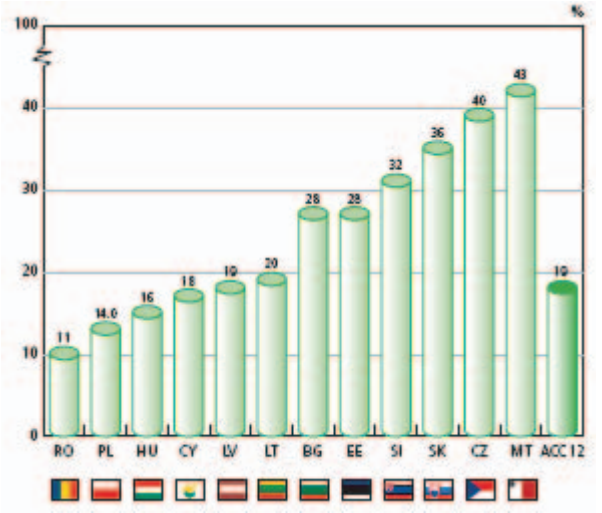
To gain an impression of the extent of the problem of absenteeism, we have used what little data there were for a rough estimate. The surveys of the European Foundation for the Improvement of Living and Working Conditions provide data on the incidence and duration of absenteeism (due to occupational accidents, work-related health problems, and other non-work-related health problems) with a distinction between the EU15 and the New Member States. This information has been combined with data on Gross Domestic Product per worker and per hour, we have made assumptions on the length of a working year and a working day, and we have assumed that all the days lost to other non-work-related health problems were due to alcohol.

Figure 12. Proportion of persons reporting an absence from work over the past 12 months in the EU15, by reason for absence, 2000



Source: European Foundation 2000.

Figure 13. Absence for 'other reasons' over the past 12 months in the new Member States and Accession Countries, 2001



Source: European Foundation 2003.

The results (Table 14) ignore the abovementioned explanation on the productivity effects of absenteeism and we have not taken into account occupational accidents due to alcohol. They do, however, serve to give an impression of the order of magnitude. In short, the two approaches to the problem arrive at a total amount of income (or rather value added) of €49 to €67 billion per year. The majority of absentees will merely have come down with the flu or some other common illness.[9] For the sake of argument, if alcohol accounts for 5% of absenteeism for other or non-work-related health problems, the costs would amount to between €2.4 and €3.3 billion. The €9 billion stated in Anderson and Baumberg (2006) suggests that alcohol accounts for 13% to 18% of this type of absenteeism.

[9] As an average, the 4.2 days also include severe illnesses, such as cancer and coronary diseases.

Table 14. Rough estimate of the costs of worker absenteeism in terms of GDP, c. 2003

	EU15	NMS
Basic data		
Absent for other reasons	34% [a]	19% [b]
Average number of days	4.2 [a]	4.2 [a]
Number of workers (thousands)	163,691	29,295
GDP per worker per year, €	€54,395	€35,363
Calculation based on GDP per worker		
Assume working days per year	275	275
GDP per worker per day, €	€198	€129
Cost of absent days per worker	€831	€540
Total costs of absent workers, €M	€46,236	€3,006
	€49,242	
Calculation based on GDP per hour		
Assumed working hours per day	8	8
GDP per hour worked	€34	€18
Cost of absent days per worker	€1,140	€605
Total costs of absent workers, €M	€63,439	€3,366
	€66,805	

[a] Figure for the EU15 in 2000. [b] 2002.
Sources: European Foundation 2000. European Foundation 2003. The Conference Board and Groningen Growth and Development Centre, Total Economy Database, January 2006, http://www.ggdc.net. OECD PPP Statistics (purchasing power parity of the Euro (average for 12 countries) and the US dollar: 0.867).

On a macroeconomic level a decline in employee absenteeism, unemployment and premature mortality basically boil down to the same set of effects. Each is, however, subtly different:

- Absenteeism combines a loss of productivity with continued wage payments, thus raising the costs of production.
- Unemployment involves a social cost that is not balanced by an individual economic contribution, thus imposing a negative externality on (working) taxpayers.
- Premature mortality ends all individual and social costs and benefits that are related to the deceased and is often viewed from a lifetime rather than a short-term perspective.

Individual versus macroeconomic effects

The link between productivity, earnings, and employment opportunities are far more obvious on an individual or microeconomic level.

Employment: The greater part of the available studies analyse the statistical relationship between the characteristics and behaviour of individuals. The conclusions cannot simply be extrapolated to the macroeconomic level, but they do explain how alcohol use influences productivity, earnings, educational attainment and employment. For example, Booth and Feng (2002) observed that drinking seven drinks or more on an average drinking day significantly increased the likelihood of not working and, for those who were working, shorter periods of employment. On a macroeconomic level, however, we deal with the behaviour of workers in the context of the labour market and production and with the marginal rather than the absolute or average effect of

the entry and exit of workers. We have not found any studies of the impact of alcohol on the social capital of the labour force.

There is some information on the effects of drinking on work performance. Anderson and Baumberg (2006) quote a study for the UK that measured a 27% decline in productivity of hung-over workers.[10] The WHO Global Status Report on Alcohol provides a few statistics on drunkenness (Austria, Finland, and France). Assuming a 25% reduction in labour productivity on a hung-over day across Europe and an 8-hour working day, we can extrapolate the few data for the three countries in Table 16 to an annual cost in terms of GDP. This is, however, a very tentative and minimum estimate. For one thing, the risk of underestimation increases with the decline in the frequency of reporting (per week in Austria, per month in Finland, and per year in France). As small as the effect seems to be, a total impact of drunkenness of between 0.1% and 0.3% of GDP translates to between €1 billion and €3 billion per year.

Table 15. Evidence on drunkenness among the adult population

	Sample evidence WHO	Estimate of productivity impact in 2005
Austria	Data from a 1993/1994 survey (5,330 males and 5,819 females) show that 2.8% of males and 0.6% of females reported experiencing drunkenness once a week. Drunkenness was defined as being very intoxicated and having memory blanks the next day.	Population aged 15-64: men 2,790,673; women 2,756,612 Employment rate (full-time and part-time): 79.2% men; 65.2% women Assume 5 weeks per year holiday Man-hours affected: men 23.3 million; women 4.1 million GDP/man-hour in EKS$2005: $49.14 Total impact on GDP: EKS$335.7 million or **€291.0 million (0.21% of GDP)**
Finland	A 1992 survey of a representative sample of the Finnish population between 15 and 69 years of age (total sample size 3,446) found that 20.2% of the total sample (30.3% of males and 9.3% of females) reported being drunk approximately once a month or more.	Population aged 15-69: men 1,877,294; women 1,853,183 Employment rate (full-time and part-time): 78.5% men; 74.6% women Assume 1 month holiday per year Man-hours affected: men 42.9 million; women 12.3 million GDP/man-hour in EKS$2005: $42.21 Total impact on GDP: EKS$582.6 million or **€505.1 million (0.30% of GDP)**
France	A 2000 national survey of 13,685 subjects aged 12 to 75 years found that among those aged 18 years and above, 14% have had at least one episode of intoxication during the last 12 months. Such episodes are more frequent among men (22%) than women (7%) and occur most often between the ages of 18 and 25 (51% of men and 22% of women).	Population aged 20-74: men 20,111,216; women 20,612,037 Employment rate (full-time and part-time): 74.9% men; 64.0% women Man-hours affected: men 26.5 million; women 7.4 million GDP/man-hour in EKS$2005: $54.06 Total impact on GDP: EKS$99.8 million or **€86.6 million (0.004% of GDP)**

Source: WHO Global Status Report on Alcohol 2004. U.S. Bureau of the Census, International Data Base. The Conference Board and Groningen Growth and Development Centre, Total Economy Database, January 2006, http://www.ggdc.net. OECD PPP Statistics (purchasing power parity of the Euro (average for 12 countries) and the US dollar: 0.867).

Heavy drinking and alcoholism can have a negative impact on an individual's opportunities on the labour market. Alcohol use among the young may have an influence on educational attainment, and poor school performance can affect future employment and earnings. Among the working-age population heavy drinking lowers worker productivity and earnings and increases the risk of absenteeism and unemployment.

[10] This was an online poll done for a private agency and may have used poor sampling procedures.

This relationship appears to work through the mental health status of employees –their emotional and psychological problems– although French and Zarkin (1998) showed that even after controlling for emotional symptoms drinking and smoking had an impact on earnings. The explanatory role of an employee's mental condition also suggests that company policies should not only discourage drinking, drug use, and smoking among employees but should also address their behavioural and emotional problems.

Earnings: Alcohol use and per capita income are not necessarily related on a macroeconomic level, but the evidence shows that on an individual level alcohol use, productivity and earnings are significantly related. Jones et al. (2006) concluded that alcoholism leads to productivity losses, that such losses are different for men and women, and that they become more pronounced with age. The impact of alcohol use and drug use among the young adds a dimension to the problem in that their environment and behaviour during adolescence help shape their future economic performance.[11]

Unemployment: Feng et al. (2001) examined the impact of problem drinking on employment among a random sample of working-age adults (4,898 men and 3,224 women) from six Southern states in the USA. Controlling for other factors that link problem drinking to unemployment, they found no significant negative relationship and suggest that estimates of the costs of problem drinking in terms of unemployment may be overstated. On the other hand, MacDonald and Shields (2003) estimate that problem drinking reduces the possibility of working by between 7% (the equivalent of having a degree as opposed to no qualifications) and 31%. In their research, problem drinking turned out to be a significant determinant of employment, regardless of an individual's tolerance to alcohol. Policies aimed at the prevention and treatment of problem drinking could therefore have important benefits to the labour market.

Disability: Alcohol use affects a person's risk for acquiring a disability pension. A Swedish study among 3,751 men showed a 19% incidence of disability pensions among abstainers, 12% among moderate drinkers (low alcohol consumption), and 16% among heavy drinkers (high alcohol consumption) (Mansson et al. 1999). The latest evidence on the famous U-curve can explain the relative high level of disability among abstainers: this group often includes former drinkers and older people with a variety of health problems. (Fillmore et al. 2006) The literature also identifies a relationship between difficulties during childhood and adolescence, trouble at school, and early abnormal behaviour on the one hand and disability pension and long-term sickness absence in adulthood on the other. However, Upmark and Thundal (2002) found that only a minor part of the risk could be attributed to alcohol dependency and abuse.

Educational attainment: Alcohol use and drug use among youths can affect their school performance. For example, evidence presented by Chatterji (2001) suggests that users of marijuana and cocaine in high school are more likely to end up completing a lower number of years of schooling. The opposite is also true: schooling promotes good health by spreading knowledge on the dangers and benefits of cigarettes, alcohol and exercise and doing so more efficiently than individual households. (Kenkel 1991)

What if alcohol-related absenteeism, truancy, unemployment, and underperformance at work decline? Every 1% increase in labour input will produce less than 1% increase in output and a decline in average labour productivity. A higher educational attainment will improve the average employment opportunities of students and the quality of labour input, in addition reducing

[11] For example, Burgess and Propper (1998) observed that alcohol and soft drug consumption have no harmful effects on the future employment, earnings levels and earnings growth of adolescents, but that hard drug consumption and violent behaviour do have a substantial negative impact.

unemployment as well as the psychosocial problems that may lead to alcohol abuse. The lower burden of absenteeism on wage costs and of unemployment on public expenditure and the tax burden improve the competitive position of industry. However, given the extent of the problem and the many moderating circumstances, the macroeconomic impacts are not likely to be significant. The impacts may still involve several billion euros across the EU25, giving an alcohol policy absolute value even when it does not have a significant relative effect on growth rates, productivity or competitiveness.

5.4 Opportunity costs

5.4.1 Health care

If the proposed policy is successful, one of its most important achievements will be a reduction in alcohol-related morbidity and mortality. The resources that are thus liberated could potentially contribute to macroeconomic performance, for example in the form of capital formation. A 10% decline in health care costs, invested at a modest rate of return of 4%, would yield €880 million (€22 billion times 10% times 4%; not discounted). Is this likely to happen?

Lower alcohol-related costs are unlikely to free resources for use outside the health care sector, given the existence of hospital waiting lists and constraints on health care capacity. In addition, a decline in alcohol-related health care would have little impact on the fixed costs of the health care industry. Such savings can, however, have a substantial effect on specific segments of health care.[12] The internal savings due to a decline in the harmful effects of alcohol use are also unlikely to be reallocated to health care R&D.

Hospital waiting lists

Waiting for medical care is very unpopular (Jowell 2000; Rico 2000; cited in Siciliani and Hurst 2004) and yet waiting lists are common to many developed countries. Siciliani and Hurst (2004) note that waiting times are a serious problem in 12 OECD countries (Australia, Canada, Denmark, Finland, Ireland, Italy, the Netherlands, New Zealand, Norway, Spain, Sweden, and the United Kingdom), while they are not considered a problem in Austria, Belgium, France, Germany, Japan, Luxembourg, Switzerland, and the United States.

On the other hand, waiting is not imposed at random and does not necessarily have a negative impact on health outcomes. Doctors and surgeons are good at prioritising. Waiting for longer periods (6 months or more) can, however, become problematic. (Siciliani and Hurst 2004) Waiting is unpopular among patients, but the existence of a list can allow hospitals to make more efficient use of available capacity, preventing underutilization and lowering fixed costs per patient. These savings are offset by an increase in administrative costs as waiting lists get longer and patients need to be reassessed regularly to keep the list up-to-date. (Siciliani and Hurst 2004)

Countries without waiting times spend more on health care per capita than countries with waiting times and are characterized by a higher contribution of private health expenditure. They have higher capacity in terms of beds and specialists and a more favourable patient density (patients per physician). Furthermore, they more frequently use activity-based funding for hospitals and fee-for-service systems for doctors. (Siciliani and Hurst 2004)

Alcohol policy can alleviate the burden on scarce hospital resources, liberate resources to invest in other health care problems, and contribute to shortening waiting lists and perhaps even saving

[12] For example, health care costs for families with an alcoholic member are twice those for families without one, and up to half of all emergency room admissions are alcohol related. (Burke 1988)

lives. The impact will be different in countries with and countries without waiting lists. However, alcohol policy is unlikely to contribute significantly:

- Waiting lists are segmented by type of treatment and specialized medical skills are not easily transferable, so that shortening a waiting list does not necessarily spill over into other specialist areas.
- Liberating resources does not increase health expenditure but reallocates resources within the health care sector. This reallocation can make it easier to lower the number of urgent cases or general reduce waiting times somewhat, but it cannot turn countries with waiting lists into countries without them. In time, there will be a knock-on effect when the reallocation of resources results in health care improvements with respect to other illnesses.
- The main solution to the problem of waiting lists will likely involve good management and understanding of the entire hospital system, a sustained approach rather than ad hoc solutions, an efficient organisation capable of catching up the apparent backlog and of dealing with unexpected shocks, and commitment among all those involved. (Appleby et al. 2005)

Health care research

An alternative application of alcohol-related savings would be to invest them in R&D. Health R&D is becoming increasingly attractive as an investment, with potentially high long-term returns.

There are four ways to view the returns to health care research. (Buxton, Hanney, and Jones 2004)

- Direct cost savings that arise from research leading to new and cheaper treatments or to developments such as vaccines that reduce the number of patients needing treatment.
- Indirect cost savings that arise when better health leads to the avoidance of lost production.[13]
- Gains to the economy in terms of product development, employment and sales.
- The intrinsic value to society of the health gain, by placing a monetary value on a life.

The effects of a decline in the harmful effects of alcohol use will be felt in the health care industry, but not in the pharmaceutical sector, largely ruling out the third possibility. For the first effect to be felt, funds need to be reallocated from public health care to public medical research.[14] This is unlikely to happen in the short term unless the impact of alcohol policy is significant. And even then it may not occur, because the two funding streams are strictly separated. The second and fourth options are the only ones that may materialize, but these concern indirect or intangible effects, without a clear link to macroeconomic development.

Conclusion

Many health-related costs fall outside the medical sector and some cost impacts may be substantial. For example, a reduction in binge drinking would greatly reduce the strain on accident and emergency services, which are very high-cost elements of the medical system and are

[13] The rate of return on the total reduction in mortality and morbidity in the USA between 1930 and 1975, taking into account the share caused by biomedical research and taking away the cost of the research, has been estimated at 47%. (Buxton, Hanney, and Jones 2004)

[14] Pharmaceutical R&D can be immensely profitable, but is unlikely to be affected by a reduction in alcohol-related health care.

heavily rationed, by lowering the incidence of binge drinking and by more evenly spreading the use of such services in time. A reduction in weekend night overcapacity is often viewed as extremely desirable in terms of the cost-effectiveness of care delivery to other types of patient.

In short, the opportunity costs of alcohol-related morbidity and mortality relate not to the alternative use of resources elsewhere in the economy but to the potential benefits of a reallocation of these resources within the health care sector. One such benefit would occur as resources are shifted from treatment (dealing with current cases) to prevention (dealing with potential new cases).

A far more important effect of the reduction in health care expenditure on alcohol-related deaths and diseases concerns the long-term knock-on effect on productivity. A shift in resources to the treatment of other diseases and to prevention helps improve the general health status of the labour force, thus adding to its efficiency.

5.4.2 Crime

Law enforcement is a necessary evil, protecting society from crime and violence but at a high cost (prevention, detection, processing, and imprisonment). Would a decline in the harmful effects of alcohol use liberate resources for use elsewhere in the economy?

A 10% decline in these effects would lead to an immediate saving through a reduction in property damage (assuming a fall in crime across all types of crime), which would amount to €600 million in the estimates presented in Anderson and Baumberg (2006). This cost saving constitutes an opportunity for alternative items of consumer expenditure and for productive investments by insurance companies.

The same decline would lead to lower prevention and insurance costs but with a time lag. Insurers calculate their premiums on the basis of risk calculations and it takes a while before a reduction in the incidence of crimes and the associated property and health care costs translates into lower premiums. In addition, the effects will have to be significant and distinct for insurance companies to notice them as a break in the trend rather than a mere fluctuation, and this may take several years. Most likely, a decline will only result in a partial fall in insurance premiums as insurers retain some of the additional profits.

The money spent on law enforcement and the police on the effects of alcohol-related crime and violence (estimated at €15 billion) would not fall immediately if at all if the harmful effects of alcohol use were to decline. These costs include high fixed costs in terms of capacity (buildings, cars, personnel) that would be redirected to other crimes rather than reallocated to productive purposes. Variable costs can also be important, for example where it concerns the concentration of crime on specific times (e.g. weekend nights) and in specific areas (e.g. city districts). Stricter enforcement of alcohol regulations could even raise the costs disproportionately: prevention has economies of scale (e.g. BAC level testing in traffic tests hundreds of drivers in one go), whereas processing has a considerable diseconomy of scale (only one case or driver at a time).

5.4.3 Drink driving

Traffic accidents involve law enforcement costs (police, processing offenders), health care costs (ambulances, treatment), insurance costs (payments to insured persons), household costs (car repairs and purchases), production losses (when goods or services are directly involved), and capital costs (when the vehicles involved represent production capacity). These costs are incurred by the drunk driver himself as well as by third parties, such as passengers, other drivers, family members, and society at large. Accidents often produce congestion, leading to a loss of time. (Daly and Cobb 1989)

A decline in drink driving and alcohol-related traffic accidents would truly free resources, albeit at the expense of the value added generated in emergency services and the automobile sector. Time savings associated with a decline in accident-related congestion after accidents would most likely benefit the quality of life of drivers (individual costs and benefits) more than the economy (social costs and benefits). Economic gains would work mainly through the amount of time involved in transporting freight and other production-related transport (e.g. couriers, travelling salesmen).

What if there occurred 10% fewer alcohol-related accidents, with fewer people injured and killed and 10% less property damage? First of all, the latter savings are not simply equal to 10% of €10 billion but represent a balance between household savings of €1 billion and a loss of revenue for car manufacturers, car repair companies, and rescue and emergency services.

The impact of a reduction in the number of traffic accidents on GDP can be estimated roughly using statistics on road traffic accidents, data on GDP per worker, labour participation and demography in the European Union, and a number of assumptions. Table 16 presents an estimated inferred loss of Gross Domestic Product attributable to alcohol-related deaths and injuries in the EU.

Table 16. Estimated contribution to GDP of persons involved in alcohol-related traffic accidents in the EU, 2003

	Killed	Injured		
Numbers killed and injured	5,156	111,041		
Percentage share of persons killed or injured in traffic accidents aged 15-64	77.2%	82.1%		
Employment rate (full-time and part-time)	63.7%	63.7%		
Impact on labour input (numbers of workers)	2,534	58,050		
GDP per employee (€)	40,618			
Assumed impact on an individual person's potential contribution to total labour input in year of accident	100%	50%	25%	10%
2003 inferred total loss of GDP, €millions	102.9	1,178.9	589.5	235.8

Note: The data cover Austria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Lithuania, Luxembourg, the Netherlands, Poland, the Slovak Republic, Slovenia, Sweden, and the UK.
Sources: Traffic accident data from Economic Commission for Europe, 2005. GDP per worker from The Conference Board and Groningen Growth and Development Centre, Total Economy Database, January 2006, http://www.ggdc.net. Employment rate from Eurostat 20/2005.

The results are fairly modest. A 10% reduction in the number of deaths would liberate a mere €10 million in GDP losses. Even when this amount is converted into a lifetime loss, the gains are not enormous. Injuries account for a larger proportion of immediate output losses with savings amounting to between €24 and €118 million depending on assumptions. The combined effect would then approximately amount to €34 to €128 million. However, assuming that the economy is not in a condition of full employment, the temporary loss of an individual's labour input can be offset by hiring a substitute or by reallocating tasks within a company.[15] In that case, injuries do impose an additional wage cost on employers.

5.4.4 Pensions

Demographic ageing is the main threat to the sustainability of European pension funds. UN population projections for Europe in the next century and a half show a decline in population size until around 2080 followed by long-term stability. (UN 1998) More detailed forecasts for

[15] This is obviously far more difficult for SMEs, particularly one-man companies.

the EU25 suggest that the decline is expected to begin somewhere around 2020 and that it starts earlier in the new Member States than in the EU15.[16]

A recent OECD report shows that European governments will find it difficult to afford their pension promises as average life expectancy rises (OECD 2006). The level of pensions varies considerably throughout Europe. A more important determinant of the costs of public pensions in the context of an alcohol policy is the duration of pension payments, which is a function of the age of retirement and life expectancy at that age. In time, the statutory retirement age may have to be raised or abolished, allowing more people to work longer than they presently do.[17] In addition, new pensions structures will arise and private pensions will become more important (Banks and Blundell 2005). Private pensions are, however, also coming under pressure for the same reasons.[18] In short, if life expectancy increases even further, we will have to reconsider the concept of age.

A future reduction in the harmful effects of alcohol consumption may lower premature mortality and increase the number of people that reach retirement age. Alcohol users who die prematurely contribute to pensions funds but do not draw a pension. In this case, widows, widowers, and children usually do receive a pension, but this is lower than the pension the deceased would have earned. The likelihood of their death is, however, included in the calculation of pension premiums. The burden on pension funds will increase when premiums stay unchanged but alcohol-related deaths decline. Even though the additional pensioners continue to contribute to the pensions funds, premiums may still increase in the long run. However, no research has been done to examine if, when and to what extent this increase would occur.

Three remarks must be made with respect to these observations:

1. The health impact of alcohol varies by age, disproportionately killing young people and extending the life of the (very) old.
2. Private pensions reflect lifetime earnings (a labour market phenomenon) and the propensity to save (a behavioural phenomenon).
3. Much old-age provision lies outside the pension system.

The issue of pensions is also closely related to that of labour input. Retirement takes many able-bodied people out of the labour force, but every increase in the retirement age will face diminishing returns (Bellaby 2006). The same would be true for a reduction in premature mortality. And current thinking on solving the pension squeeze states that increases in fertility and immigration cannot alleviate the threat of population ageing (Gonnot et al. 1995; Coppel et al. 2001).

What would be the impact of, say, a 10% reduction in premature alcohol-related mortality on the number of contributors to pension funds? Anderson and Baumberg (2006) estimate the total number of alcohol-related deaths in the EU at 195,000. In 2005 the total working population of the EU25 amounted to 170,570,000 employees (Conference Board 2006). A 10% decline in

[16] Forecasts based on data from the US Census International Database (http://www.census.gov/ipc/www/idbnew.html).

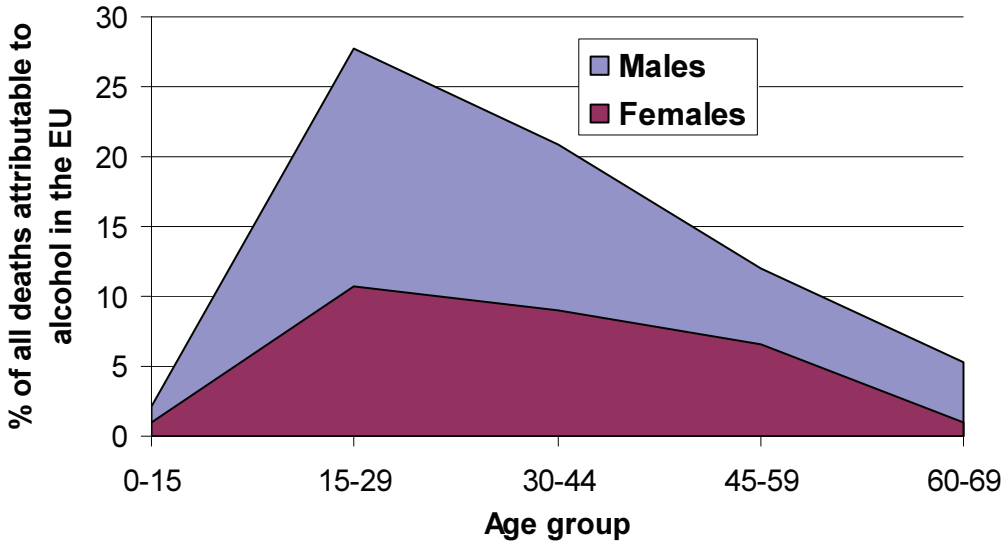
[17] "Assuming average OECD mortality rates and a baseline retirement age of 65 for both men and women, each additional year of work after 65 without drawing a pension reduces the cost of a government's pension obligations by more than 3%" (OECD 2006). Louria (2005) proposes a major shift in thinking, changing from a "simple linear approach" to a "broader systems approach".

[18] Aon predicts that for every year of increased life expectancy, pension costs will rise by approximately 3.5 per cent. This could equate to increased liabilities for the FTSE 100 of £10 billion or £100 million each (Aon 2004).

mortality would represent a 0.01% increase in the working population. A reduction in alcohol-related premature mortality would have an effect on pension funds but it would not be very significant.

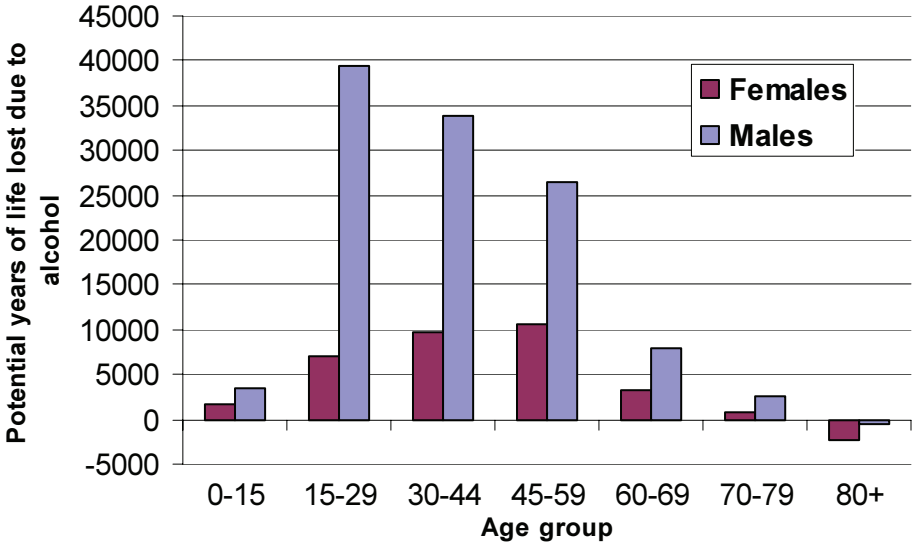
Alcohol-attributable deaths are not evenly distributed among the age groups. Figure 14 shows that the age group of 15 to 29 year-olds is responsible for more than 25% of all alcohol-attributable deaths in the EU25 and that the share of older age groups declines with age. The data suggest that (a) younger people run a higher risk of dying due to alcohol use and (b) above a certain alcohol may bestow health benefits on the drinker, thus adding to life expectancy. Figure 15 presents Canadian data on alcohol-attributable deaths expressed in potential life years lost. These data show a similar pattern as that of the EU25 in Figure 14. They also reveal a small health benefit from alcohol use for people over the age of 80.

Figure 14. The share of deaths attributable to alcohol in EU citizens younger than age 70 years, 2000



Source: Rehm 2005 (cited in Anderson and Baumberg 2005)

Figure 15. The potential years of life lost in Canada due to alcohol, 2001



Source: Rehm 2005 (cited in Anderson and Baumberg 2005)

With reference to the issue of the impact of alcohol on pension funds, the age distribution of alcohol-attributable deaths suggests that a significant proportion of premature mortality affects those who have contributed to pension savings for a relatively short period (up to the age of 44). This implies that in financial terms the proportion of pension premium that can be attributed to alcohol-related deaths is lower than was suggested in the above. Alcohol policy would consequently not have a very significant impact on the pension squeeze.

5.4.5 Insurance

The harmful effects of alcohol use –in terms of lost lives, health care expenditure, and property damage– translate into higher insurance costs. Specific risks are elevated, which has to be factored into insurance premiums. A major issue in the relationship between the social costs of insurance and the incidence of alcohol-related harmful effects is whether or not the risks of alcohol use have been internalized: do drinkers pay a higher premium for health care or car insurance than non-drinkers to capture their higher levels of risk? If this risk is not internalized, it is spread among all insured. Drinkers then impose a cost (a negative externality) upon non-drinkers, and excessive drinkers and ill-behaved drinkers impose costs on the more responsible insured.[19] On the other hand, reinsurance markets have helped insurance companies to manage the major risk classes, including the damage caused by drinkers.

Imposing a surcharge on insurance premiums seems fairly straightforward, but it does have three major limitations. First, a surcharge for risky or harmful behaviour can only be based on objective evidence (after the fact) and not on self-reporting (before the fact). Insurance premiums can therefore curtail but not prevent risky behaviour. Second, the risk of drinking cannot be easily isolated from other types of risk. For heavy drinkers and alcoholics, alcohol use is part of a lifestyle that often includes smoking, poor nutrition, and poor self-care (Heien 1995). And finally, in the case of health insurance the internalisation of risk is not merely a case of placing the costs of alcohol-related risk on drinkers. Most drinkers behave responsibly and do not drink and drive or work, essentially making their level of risk for specific types of behaviour (such as drink-driving) the same as that of non-drinkers. More importantly, evidence shows that the health care costs of moderate drinkers are lower than those of abstainers. In the USA in 1988, average health care costs for all drinkers were $3,295 per person as against $4,430 for abstainers (Heien 1995). As stated before, the analysis of Fillmore et al. (2006) explains that this is most likely due to measurement errors.

The practice of punishing drivers convicted of drink driving by imposing a surcharge on their car insurance premium is well established. Sloan and Githens (1994) examined this practice in the United States. Their most significant conclusion is that "imposing premium surcharges for a charge of drunk driving has a significant deterrent effect on the probability of drinking and driving." Car insurance costs can encourage drivers to be more careful. Reporting on an American study, Williams (2003) concludes that the "biggest motivating factor for safe driving was concern for safety of others in their vehicle, followed by negative outcomes such as being in a crash, increased insurance costs, and fines" and that "the greatest threats to their safety were thought to be other drivers' actions that increase crash risk such as alcohol impairment or running red lights." On the other hand, the way in which insurance premiums work is one step removed from the objective of ending drink-driving altogether.

In the EU15 four countries explicitly exclude conditions related to alcohol abuse from voluntary health insurance coverage. (Mossialos and Thomson 2004)

- *Finland*: alcoholism

[19] The same is true for many other risks, such as smoking, poor driving skills, and perhaps even obesity.

- *Italy*: alcohol and drug addiction
- *Spain*: alcoholism and drug addiction
- *Sweden*: diseases and injuries as a result of the use of alcohol or other intoxicating substances

However, American evidence on the effects of excluding drinkers and smokers from subsidized health care suggests that such exclusions do not necessarily lower unhealthy behaviour. Khwaja (2001) concludes that "subsidized medical treatment increases the demand for medical care but does not significantly increase unhealthy behaviors" and that "withdrawal of subsidized medical treatment reduces demand for medical services but increases unhealthy behaviors at the younger ages". Exclusion also hinders the treatment of alcohol dependents and abusers and provides a disincentive to developing and providing the right medical care. (Teitelbaum et al. 2004)

What will happen to premiums when risk goes down with a decline in alcohol use? A reduction in alcohol-related morbidity, mortality, traffic accidents, and crime will in time translate into lower insurance premium unless the specific risks had already been internalized. There will be a time lag between the realization of benefits and the decline in premiums, as insurers need robust evidence on levels of risk. If risks have not been internalized, all insured will benefit from a decline in alcohol-related risk, drinkers and non-drinkers alike. The macroeconomic impact is unlikely to be significant.

5.5 Taxation and public revenues

One policy option is to raise the level of excises on alcoholic beverages. Under normal conditions, an increase in the excise duty raises the price of a beverage, thus lowering demand. The nature of the good and the preference of consumers determine the extent of the effect. Excise duties make up a considerable proportion of the consumer price of alcohol. Raising excise rates could be an effective way to lower alcohol use.

There are limits to what excises can achieve. First, they only have an effect on consumption and not directly on the behaviour of drinkers. Second, consumers do not simply choose between alcoholic and non-alcoholic beverages, but can shift their preferences between alcoholic beverages. For example, an increase in the price of wine can cause consumer to drink beer instead. And third, there are considerable differences between the Member States in patterns of alcohol production and consumption and in levels of excise taxation.

In this section we look at the potential impact of a change in excise duties on alcohol consumption and public excise revenues. What happens when excise duties are raised and where would the effect be felt most (in which Member States and for which types of beverage)?

5.5.1 The level of taxation

Levels of excise duties on alcohol vary considerably. Current levels are a function of the legacy of alcohol policy and production in each Member State (Table 17). Finland, Sweden, the United Kingdom and Ireland have the highest level of taxation. In these countries alcohol is a strictly regulated consumer product. Wine excise rates vary considerably, but the most noteworthy observation is that Europe's major wine-producing nations do not levy an excise rate on wine.

Table 17. Excise rate duties in the EU25

	standard excise rates 1 Jan 2006				excise as % of price [a]	
	beer [b] €/hl	beer [c] €/hl	still wine €/hl	sparkling wine €/hl	beer %	still wine %
Austria	2.00		-	-		-
Belgium	1.71		47.10	161.13	1.0%	20.9%
Cyprus		4.89	-	-		
Czech Republic	0.81		-	79.06	1.8%	
Denmark		6.82	82.28	123.28	3.7%	15.4%
Estonia		3.71	66.47	66.47	3.0%	12.9%
Finland		19.45	212.00	212.00	5.2%	31.8%
France		2.60	3.40	3.40	2.0%	1.1%
Germany	0.79		-	136.00	0.5%	
Greece	1.13		-	-		
Hungary	2.02		-	45.48	1.9%	
Ireland		19.87	273.00	564.01	4.7%	22.6%
Italy	2.35		-	-	0.7%	
Latvia		1.87	43.10	43.10	1.6%	14.3%
Lithuania		2.03	43.44	43.44	2.5%	10.7%
Luxembourg	0.79		-	-	0.5%	
Malta	0.75		-	-	2.0%	
Netherlands	5.50		59.02	201.24	4.2%	10.3%
Poland	1.75		34.71	34.71	2.0%	12.1%
Portugal	8.10		-	-	7.6%	
Slovak Republic	1.29		-	61.77	1.2%	
Slovenia		6.86	-	-	2.6%	
Spain	0.91		-	-	0.7%	
Sweden		15.79	237.20	237.20	6.1%	45.5%
UK		19.00	246.65	324.32		
Average					*2.6%*	*9.4%*

[a] Excise rates on 1 January 2006 compared with price levels in 2003. [b] Excise rates in countries that have adopted the minimum rate of €0.748 per hl/degree Plato of finished product. [c] Excise rates in countries that have adopted the minimum rate of €1.87 per hl/degree Plato of finished product.
Source: EC, *Excise duty tables. Part I: Alcoholic beverages* (DG TAXUD, January 2006). WHO 2003.

Based on the level of excise rates for individual types of beverage, we can distinguish between three groups of countries:

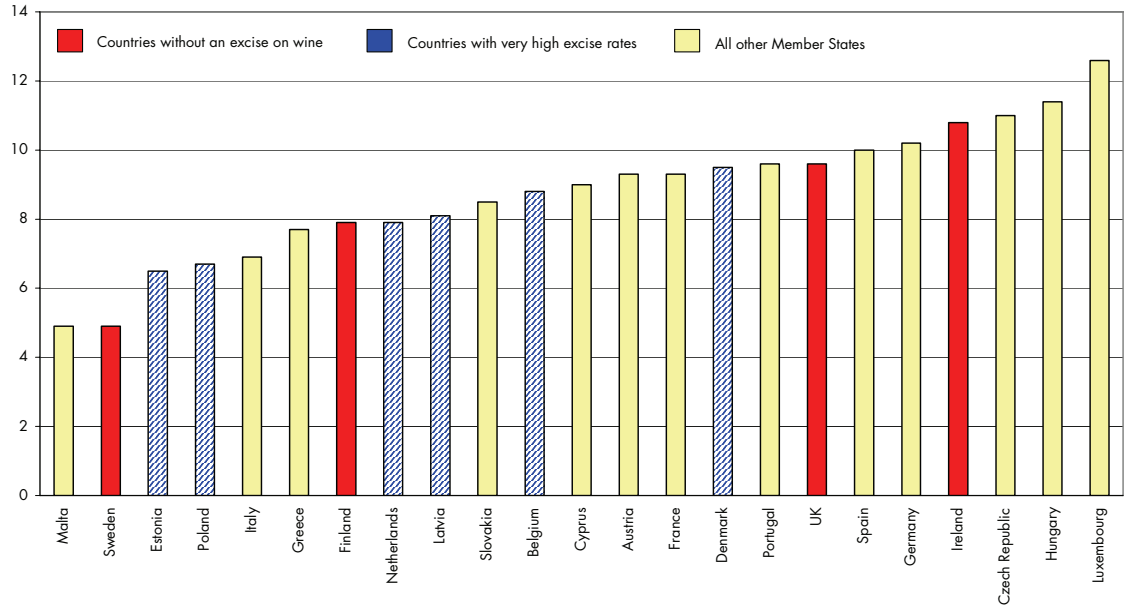
- *Countries without an excise on wine, most of which are wine-producing nations*: Austria, Cyprus, Czech Republic, France, Germany, Greece, Hungary, Italy, Luxembourg, Malta, Portugal, Slovakia, Spain
- *Countries with very high excise rates*: Finland, Ireland, Sweden, the United Kingdom
- *All other Member States*: Belgium, Denmark, Estonia, Latvia, the Netherlands, Poland

Table 18. Average annual per capita alcohol consumption in three groups of EU Member States, 2003

	beer litres	wine litres	spirits litres of pure alcohol	total alcohol litres of pure alcohol
Countries without an excise on wine (incl. France and Hungary)	76.2 (5.9)	33.0 (0.3)	2.2 (2.0)	9.3
Finland, Ireland, Sweden, UK	94.3 (36.5)	19.6 (126.0)	1.7 (7.3)	8.3
All other MS	77.0 (8.4)	15.7 (28.8)	2.1 (2.7)	7.9

Note: Average excise duties in parentheses.
Source: World Drink Trends 2005. Institute of Alcohol Studies 2006.

Figure 16. Per capita consumption of alcoholic beer, wine and spirits, 2003 (total in pure litres of alcohol)



Source: World Drink Trends 2005.

Table 18 summarizes the (unweighted) average consumption of beer, wine, and spirits as well as total alcohol consumption in each of the three groups of countries. The data in this table lead to three observations:

(1) The per capita annual consumption of wine in countries without an excise on wine is substantially higher than in the other Member States. This is not offset by a significantly lower consumption of other types of beverage, so that total alcohol consumption is higher than elsewhere.

(2) The four countries with very high excise rates are characterized by high beer consumption and low spirits consumption. Apparently, the latter type of beverage is more sensitive to price than beer. There may be other factors that explain the relationship, in particular that some countries with high excise rates also follow a strict regulatory approach, e.g. imposing sales restrictions.

(3) Levels of excise duties in the remaining countries lie between those of the other two groups of countries and yet per capita alcohol consumption is lower.

These observations can be interpreted as an indication that excises may be an effective instrument for curbing alcohol use, but it certainly shows that excises cannot be the only instrument. A more comprehensive approach is necessary.

5.5.2 Impact of a change in excise duties

The big question is what will happen to alcohol consumption and public revenues when excises are used as a policy instrument. For example, what happens when wine-producing countries introduce an excise on wine or when excise duties are raised across the EU25?

Consumer response to a change in prices

An increase in excise duties implies an increase in consumer prices. For each individual normal good, an increase in price results in a fall in demand.[20] However, goods and services have substitutes and complements. For example, bread and butter are complementary goods, while cars and public transport are substitutes.

Two different effects must be taken into account. First, each product has its own elasticity, which measures the degree of change in consumption in response to a percentage change in price or income. Table 19 presents estimates for the price and income elasticities of alcoholic beverages in four groups of EU15 Member States. These data show that every 1% increase in income results in an increase of 0.752% in alcohol consumption. The response to a change in prices depends very much on the nature of the country. In the wine-producing countries and in the other countries alcohol is a relatively inelastic commodity: for every 1% increase in price, the quantities consumed decline by a much lower amount (0.216% and 0.495% respectively). The effect is more significant in monopoly countries (-0.782% for a 1% increase) and only in the Netherlands is alcohol an elastic commodity (-1.466% for a 1% increase).

Table 19. Price and income elasticities of alcoholic beverages in the EU15, c. 2000

	price elasticities	income elasticities
Monopoly countries	-0.782	0.752
Wine producers	-0.216	0.752
Netherlands	-1.466	0.752
other countries	-0.495	0.752

Note:
–Monopoly countries: Finland, Sweden, Norway
–Wine producers: Austria, France, Greece, Italy, Portugal, Spain
–Other countries: Belgium, Denmark, Ireland, UK
Source: ECAS.

The second effect concerns the shift between beverages as the price of individual alcoholic beverages changes. These cross-price elasticities measure the effect of an increase or fall in the price of one good (e.g. beer) on the consumption of other goods (e.g. wine and spirits). If the cross-price elasticity is negative, then the two goods are complementary: a price increase in one good results in a decline in the consumption of that good and that of its complements. If the

[20] Giffen goods have an inverse reaction. For example, a Rolex watch becomes more attractive as the price goes up rather than down. The standard response to an increase in prices is, however, a decline in demand.

cross-price elasticity is positive, then the goods are substitutes and a price fall in one good results in an increase in consumption of the other good.

Table 20. Estimated own-price and cross-price elasticities in the UK, 1993-1996

		impact on quantity consumed		
		beer	wine	spirits
1% change in price	beer	**-0.76**	-0.60	-0.59
	wine	-0.17	**-1.69**	0.66
	spirits	-0.20	0.77	**-0.86**

Source: Zoë Smith, "The revenue effect of changing alcohol duties", Institute for Fiscal Studies briefing note no. 4. (1999)

Table 21. Estimated own-price and cross-price elasticities in the UK, c. 2002

		impact on quantity consumed			
		on-trade beer	off-trade beer	wine	spirits
1% change in price	on-trade beer	**-0.48**	0.06	-0.71	-0.95
	off-trade beer	0.43	**-1.03**	0.56	0.46
	wine	-0.32	-0.07	**-0.75**	0.30
	spirits	-0.15	-0.29	-0.33	**-1.31**
1% change in income		-0.18	0.55	1.51	0.69

Source: Huang 2003.

Table 19 and Table 20 present estimates of own-price and cross-price elasticities of beer, wine and spirits in the United Kingdom. The data in these tables show three things:

- In the 1990s in the UK, most alcoholic beverages were complementary goods. The distinction between on-trade beer and off-trade beer in 2002 shows that off-trade beer is a substitute for other alcoholic beverages, whereas most other beverages are each other's complement.
- With the exception of wine, any 1% increase in prices resulted in a less than 1% change in consumption.
- A 1% increase in income results in a less than 1% increase in the consumption of most alcoholic beverages.

The tables show that *ceteris paribus* (if all else remains the same) a 1% increase in excise duties lowers alcohol consumption by less than 1% and, since most alcoholic beverages are complements rather than substitutes, the effect will be a decline in aggregate alcohol consumption rather than a shift between types of alcoholic beverage.

Scenarios for a change in excise duties

We have tested five scenarios for a harmonisation of excise duties across the EU25 to ascertain whether the statement on the significance of excises on consumption is correct.

(1) Introducing a 10% excise on wine in wine-producing countries that currently do not levy such a tax. All other excise rates are left unchanged.

(2) Harmonizing the excise duty on beer to 2.5% and on wine to 10% across the EU25. Rates below this amount are raised and higher rates are lowered.

(3) Harmonizing the excise duty on beer to 5% and on wine to 20% across the EU25. Rates below this amount are raised and higher rates are lowered.

(4) Introducing a minimum excise duty in all EU Member States of 2.5% for beer and 10% for wine. Rates below the minimum are raised, while all other rates are left unchanged.

(5) Introducing a minimum excise duty in all EU Member States of 5% for beer and 20% for wine. Rates below the minimum are raised, while all other rates are left unchanged.

The calculations are based on excise, price and consumption data for Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Luxembourg, Malta, the Netherlands, Poland, Portugal, Slovak Republic, Spain and Sweden. The outcomes are based on a number of assumptions:

- We have applied the price elasticities of Table 19, assuming that the elasticities for all countries not covered by this table were equal to those for the other countries in Table 19.
- For lack of data we have had to assume that the price elasticities for all alcoholic beverages are the same across types, even though Table 20 shows that beer, wine and spirits have different own-price elasticities.
- No adjustment has been made for cross-price elasticities for lack of adequate representative data.
- The estimates only concern beer and wine in the benchmark year 2003.

Table 22. Change in the total consumption of beer and wine in five excise scenarios, 2003 (%)

scenario		beer	wine
1	Introducing a 10% excise on wine in wine-producing countries that currently do not levy such a tax	0.0%	-1.4%
2	Harmonizing the excise duty on beer to 2.5% and on wine to 10% across the EU25	-0.3%	-1.6%
3	Harmonizing the excise duty on beer to 5% and on wine to 20% across the EU25	-1.4%	-5.1%
4	Introducing a minimum excise duty in all EU Member States of 2.5% for beer and 10% for wine	-0.2%	-0.2%
5	Introducing a minimum excise duty in all EU Member States of 5% for beer and 20% for wine	-1.5%	-5.5%

Figure 17. Impact of five excise scenarios on wine consumption in EU Member States, 2003 (%)

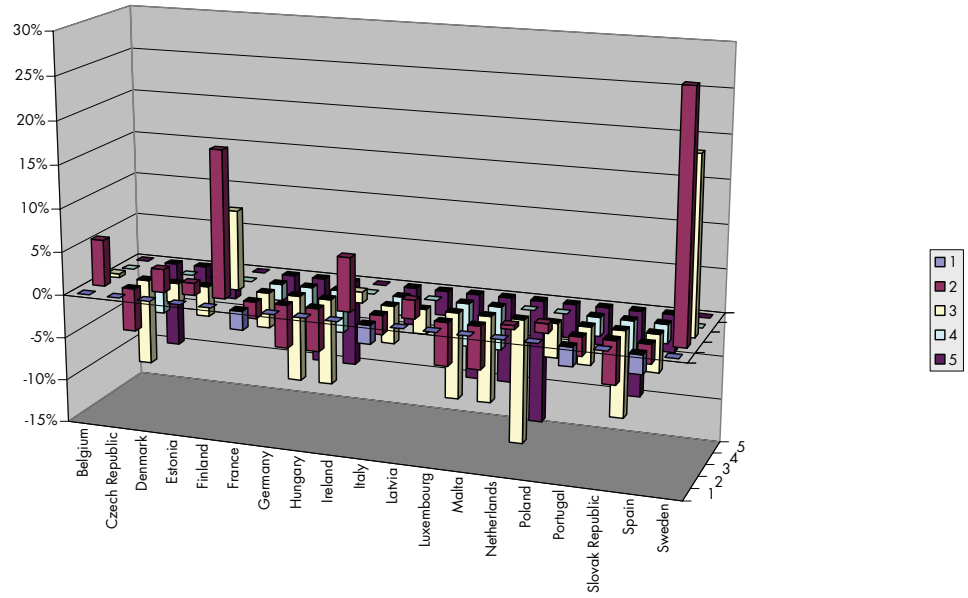
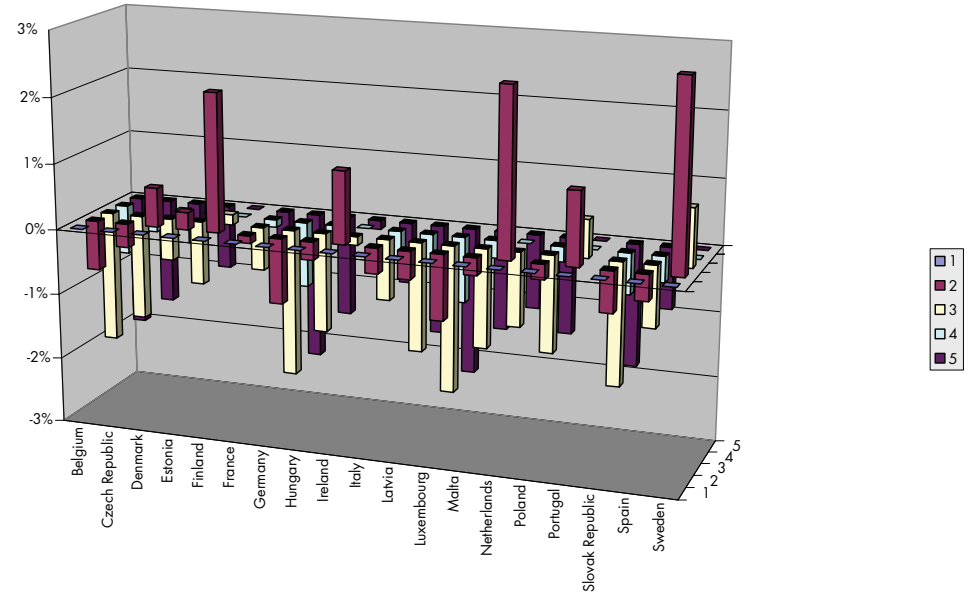


Figure 18. Impact of five excise scenarios on beer consumption in EU Member States, 2003 (%)



The results of our exercise indicate that different changes in excise duties have a very low effect on average per capita beer consumption and only a modest effect on wine consumption. Figure 17 and Figure 18 show that the effects are more pronounced in some countries than in others, but even then the decline in consumption rarely exceeds 10% for wine and that 2% for beer. When income elasticities are factored into the equation, then the decline caused by the increase in prices is almost entirely counteracted: alcohol consumption increases by between 0.5% and 0.75% for every 1% increase in per capita income.

There is, however, evidence to suggest that excises are very effective with respect to heavy drinkers and young drinkers. For example, Cook and Tauchen (1982) found that alcohol use among chronic heavy drinkers responded to changes in the price of liquor and they estimated that a $1

increase in excise taxation could reduces liver cirrhosis mortality by 5.4% in the short run and perhaps twice as much in the long run.

Finally, there appears to be a link between alcohol and tobacco consumption. Decker and Schwartz (2000) have tested data on the alcohol consumption and smoking behaviour of individuals in the United States. They found that higher alcohol prices lowered alcohol consumption as well as smoking, whereas higher cigarette prices reduced smoking but increased alcohol consumption. Pierani and Tiezzi (2005) estimated aggregate own-price and cross-price elasticities in a time series analysis for the period 1960-1992. They also identified alcohol and tobacco as complementary products, but concluded that "the optimal strategy for maximizing public revenues through increases in 'sin' goods excise taxation would be to raise alcohol taxation more than tobacco." In short, the negative effect on consumption of an increase in alcohol taxation yields positive externalities through the effects on tobacco consumption.

Effect on public revenues

The effect on public revenues depends on own-price and cross-price elasticities as well. The own-price elasticities of beer, wine and spirits suggest that a 1% increase in the price raises revenues for beer and spirits, while lowering those for wine. Cross-price elasticities suggest an increase in revenues for most products, but a decrease in wine excise revenues for an increase in excise rates on spirits and vice versa. As the Institute for Fiscal Studies explains:

> "Other things being equal, the more responsive people are to a change in the price of a good, the more likely it is that a cut in duty will lead to an increase in revenue. This is because, for a given fall in price after a tax cut, the more responsive people are, the larger the increase in sales, so the more likely it is that the extra revenue from the increase in sales will outweigh the loss per unit sold." (Smith 1999)

In short, a rise in excise duties would cause total alcohol consumption to fall and public excise revenues to increase. Price changes would not lead to wholesale shifts between alcoholic beverages. Excise duties alone are not sufficient to achieve a sustained decline in alcohol use or an associated change in harmful behaviour, but they can be effective with respect to particular groups of consumers, most notably heavy drinkers and young drinkers. Since the impact on consumption would be entirely due to an artificial impulse –an increase in taxation– rather than a real impulse –changes in the costs structure or efficiency of alcohol production, industry would incur a net loss: production capacity would remain the same, but demand would fall, producer prices would remain constant while the unit costs of output would rise, and profits would fall.

5.5.3 The social costs of unrecorded consumption

Unrecorded consumption includes illegal production, counterfeit products, and smuggling. It can be defined as untaxed alcohol sales, but also involves health problems (as a result of adulterated alcohol) and organized crime (smuggling rings). The extent of this phenomenon varies considerably among the Member States; it is particularly pronounced in the New Member States (Table 1). Unrecorded consumption involves more than tax evasion: it imposes a cost on society.

Excises internalize part of the social costs of alcohol consumption. Drinkers pay additional taxes in proportion to their intake. These taxes contribute towards the health care, judicial and other costs related to the harmful effects of alcohol use. Tax evasion imposes a negative externality: drinkers of illicit beverages contribute less to the social costs of alcohol use than drinkers of taxed beverages and the associated costs are imposed on society at large, drinkers and non-drinkers alike.

Raising levels of excise taxation may cause a decline in alcohol consumption and an increase in revenues. However, in Member States with high levels of unrecorded consumption revenues may actually fall as consumers switch to illicit products. In addition, alcohol is sold through extensive

illicit networks, often with vast numbers of outlets. This presents an enormous challenge to governments and raises the costs of enforcement.

CHAPTER 6 Comparing the policy options

6.1 Policy options

The Commission has identified four options for future alcohol policy:

(1) **No change**: Policy decisions and initiatives will be left largely to Member States and stakeholders, while the EU continues to finance projects and networks, support research, facilitate exchange of best practice, and collect and disseminate information on alcohol consumption and harm, but does not coordinate activities across policy domains.

(2) **Coordination of activities at EU level**: Similar to option 1, but the EU would encourage stakeholders throughout the European Union to undertake similar activities (e.g. self-regulation, common codes of conduct on commercial communication, exchange of best practice on interventions) and to hold Member States to their Treaty obligations.

(3) **A comprehensive strategy**: Application of a wide variety of policy instruments (legislation, self-regulation, information and education campaigns, exchange of best practice, stakeholder involvement) across all relevant policy domains (internal market, taxation, transport, education, research and consumer policy). The strategy would focus on:

Drink-driving

Coordinated campaigns

Protection of third parties

Commercial communication

Consumer information

Availability and prices

(4) **Purely regulatory**: Focus on stricter regulation and stronger enforcement to achieve a decline in the harmful effects of alcohol use.

One of the difficulties of this impact assessment is that the four policy options currently exist only in principle. The impacts of a European communication on alcohol policy will depend on its details and most particularly on the operationalization of the proposed actions and initiatives. The Commission has three types of implementation mechanism at its disposal:

Regulations and Directives or rule setting

Rewards and incentives or financing

Communication and coordination or facilitating

Most impacts will depend on the preferences and choices of the main actors, on the response of stakeholders, and on the way in which the various measures will be implemented by Member States and other levels of government. Our comparison of the four policy options is consequently based on an understanding of the fundamental principles of each option and of the effectiveness and cost-effectiveness of the instruments that may be deployed.

6.2 The effectiveness and cost-effectiveness of policy instruments

The report by Anderson and Baumberg (2006) identifies a range of policy actions that closely match the EC's specific and operational objectives. The effectiveness and cost effectiveness of each policy action on the respective matrices is outlined in the following tables, using Anderson and Baumberg's criteria (Table 23).

Table 23. The effectiveness and cost-effectiveness of policy actions

Effectiveness

Operational objectives \ Specific objectives		Drink driving	Under-age drinking	Hazardous & harmful drinking	Families & children	Violence	Economic develop-ment
Regulation & enforcement	Taxation	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●
	Advertising	●●◐○	●●◐○	●●◐○			
	Other regulation	●●●◐	●●●◐	●●●◐		●●●○	
	Enforcement	●●●○	●●●○	●●●○		●●●○	
Information, awareness, training & education	Community	●●○○	●◐○○	●◐○○	●○○○	●●●○	
	Individual	●◐○○	●●○○	●◐○○	●○○○	●●○○	●●○○
	Social responsibility	●◐○○		●◐○○			●●○○
Treatment		●●●○			●●◐○	●●◐○	●●●○

Cost-effectiveness

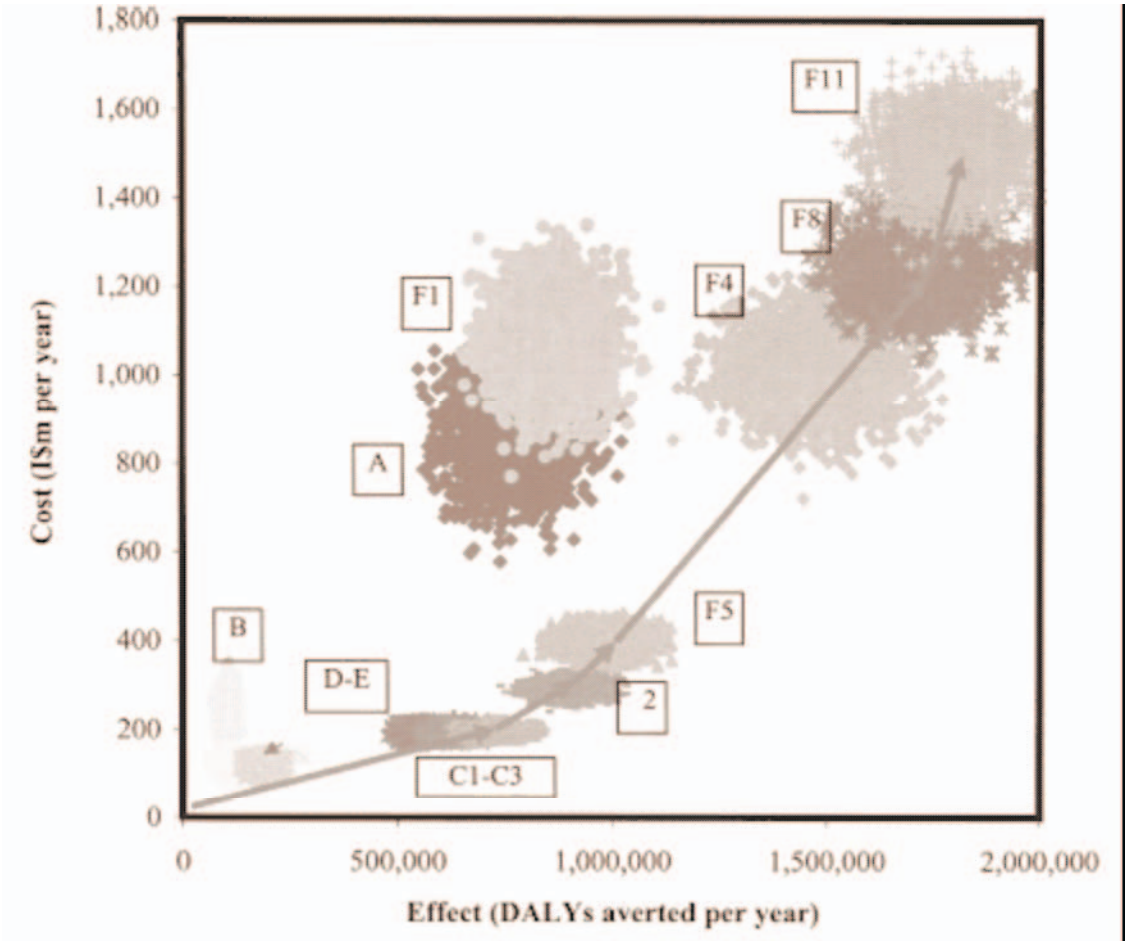
Operational objectives \ Specific objectives		Drink driving	Under-age drinking	Hazardous & harmful drinking	Families & children	Violence	Economic develop-ment
Regulation & enforcement	Taxation	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●
	Advertising	●●●○	●●●○	●●●○	●●●○	●●●○	
	Other regulation	●●●●	●●●●	●●●●		●●●●	
	Enforcement	●●○○	●●○○	●●○○		●●○○	●●○○
Information, awareness, training & education	Community	●●◐○	●●◐○	●●●○	●●●○	●●●○	
	Individual	●●●○	●●○○	●●●○	●●●●	●●○○	●●○○
	Social responsibility	●●●○		●●●○		●●○○	●●○○
Treatment		●●●○		●●◐○	●●◐○	●●◐○	●●○○

The effectiveness criterion refers to the scientific evidence demonstrating whether a particular strategy is effective in reducing alcohol consumption, alcohol-related problems or their costs to society. The tables are based on the work of Anderson and Baumberg (2006) who used the following rating scale:
O Evidence indicates a lack of effectiveness (●○○○)
+ Evidence for limited effectiveness (●●○○)
++ Evidence for moderate effectiveness (●●●○)
+++ Evidence of a high degree of effectiveness (●●●●)
? no studies have been undertaken or there is insufficient evidence upon which to make a judgement.
Taxation was not distinguished by specific objective.
See appendix 1 for detailed information.

The effectiveness of regulation and enforcement (the "hard" instruments) is generally high, while that of information, awareness, training and education (the "soft" instruments) is generally lower. The two categories are closer in terms of cost-effectiveness. The second "soft" instruments appear to be moderately to highly cost-effective in the areas of drink-driving, hazardous and harmful drinking, and families and children, but much less cost-effective in tackling the issues of violence and economic development.

A recent WHO study (Chisholm et al. 2004) estimated the cost-effectiveness of policy interventions aimed at reducing the burden of hazardous drinking in different regions of the world. For Europe, they examined France, Norway, Armenia, Poland, Russia, and Estonia. The results are visualised in Figure 19. Extrapolation of intervention effect sizes to other regions should be treated with caution given each country will have its own socio-cultural setting, and demographic and epidemiological characteristics.

Figure 19. Cost-effectiveness of policies to curb heavy drinking



Source: Chisholm et al. 2004.
A: Brief physician advice
B: Random breath testing
C1: Taxation (current); C2: Taxation (current +25%); C3: Taxation (current +50%)
D: Restricted access (sales)
E: Advertising ban
F1: Brief advice plus random breath testing
F2: Tax (highest) plus advertising ban
F4: Brief advice plus tax (highest)
F5: Tax (highest) plus advertising ban plus restricted access
F8: Brief advice plus tax (highest) plus advertising ban plus restricted access

F11: Brief advice plus tax (highest) plus advertising ban plus random breath testing plus restricted access

The individual interventions vary considerably:

- Brief physician advice on primary care (A) is roughly 50% more effective than taxation (at its current level) but is approximately four times as expensive.
- The marginal return to an increase in taxation (C1 to C3) is somewhat below unity: a 50% increase in taxation results in a less than 50% increase in DALYs (Disability Adjusted Life Years) averted. The big advantage of taxation in terms of cost-effectiveness is that an increase in tax rates involves low marginal costs. The main increase in costs concerns monitoring and enforcement as non-compliance increases with taxation.
- Restricted access (D) and an advertising ban (E) are relatively cheap but only generate a small effect. Moreover, there is little or no room for expanding these interventions. These two measures may, however, serve a very particular purpose, namely to curb the rising trend in alcohol use among the young.
- Random breath testing has perhaps the worst ratio of costs to effects, making it a relatively expensive method.

Chisholm et al. (2004) do note that the effectiveness of a particular policy (or set of policies) depends on the prevalence of harmful alcohol use. Taxation is most cost-effective in populations with a high prevalence of heavy drinking, whereas targeted strategies, such as brief physician advice on primary care, random breath testing, and an advertising ban are more cost-effective in populations with a low prevalence.

With the exception of the current policy environment, the effectiveness and cost-effectiveness of the various policy options cannot easily be determined. At this stage they exist in principle rather than in detail. How do these principles compare?

6.3 The nature of each policy option

Before turning to more detailed examination of the impacts of each option on specific macroeconomic and sectoral developments, we will briefly compare the options according to two criteria:

- *Scope*: The main distinction with respect to scope is whether policies approach the problem via alcohol use (either across the board or among specific target groups such as heavy drinkers or youths) or via the behaviour of drinkers. Use and behaviour are intricately related but not mutually identical. Irresponsible and antisocial behaviour are reinforced but not caused only by alcohol use. Some people have poor driving skills or violent and criminal tendencies, or they are poor students or inefficient workers. It is possible for alcohol use to remain constant, while the harmful effects decline, although this is highly unlikely.
- *(Cost)effectiveness*: The best approach may not be supported by the most effective and inexpensive policy instruments. Using Anderson and Baumberg's assessments in Table 23, we have drawn a brief and tentative conclusion on the (cost)effectiveness of each option.

Finally, we have made a first general assessment of the four options.

Table 24. A high-level comparison of the four options

	Scope, particularly use versus behaviour	(Cost) effectiveness	General assessment
Option 1: No change	Current mix of national policy instruments, some aimed at behaviour and others at use.	As is.	The trend in the harmful effects of alcohol use will not change. Their development will be determined by trends and patterns in alcohol use and by the effectiveness of current EU, Member State, and industry initiatives.
Option 2: Coordination	Same mix of instruments as in option 1, but with greater collaboration and knowledge exchange between Member States (e.g. copying best practices) and stakeholders (e.g. co- and self-regulation).	Higher effectiveness through coordination balanced against higher transaction costs of collaboration and communication.	Probably more effective version of option 1, e.g. with better treatment of cross-border issues and synergies between policy areas, but without structural improvement in alcohol policy.
Option 3: Comprehensive framework	Combination of policies aimed at use and behaviour, with the emphasis on encouraging responsible behaviour. This option may capitalize on the synergies between different policy approaches (especially education versus regulation) and on the economies of scale and scope inherent in a pan-European strategy.	Stronger emphasis on communicative instruments (information, awareness, training, education) –which tend to be less (cost)effective– backed up by regulation and legislation. Communication, regulation and treatment can, however, reinforce each other when used in a carefully designed comprehensive package.	Potentially most efficient and effective approach in that it combines policies intended to lower alcohol use with activities aimed at behavioural change. A European strategic approach would combine the synergies of international collaboration (option 2) and the effectiveness of regulation (option 4) with a campaign to achieve a sustained or innate change in behaviour.
Option 4: Regulation	Focus mostly on alcohol use with behavioural change as a secondary effect. Taxation, restrictions on access and availability, and advertisement bans target alcohol consumption as the most easily observable fact.	Regulatory instruments are among the most effective and cost-effective methods. A focus on regulation would mainly involve more stringent rules and, above all, an increase in monitoring and enforcement. The latter activities are less (cost)effective, especially because an emphasis on regulation raises the risk of non-compliance.	A focus on regulation will lower alcohol use. This will contribute to a reduction in the harmful effects of drinking, for example because heavy drinkers are more sensitive to higher excises than moderate drinkers and because youth drinking will be discouraged. Yet without a supporting information and education campaign, changes in use may not become engrained in consumer behaviour.

6.4 Specific impacts

Based on the analysis in Chapter 5 and the high-level assessment of the four options in Table 24 we have assessed the impact of each option on a range of policy areas with an emphasis on the economic aspects. Option 1 is considered the baseline estimate: in this option all trends will continue and problems persist.

Table 25. Impacts relative to the baseline scenario of option 1 per policy domain

	Option 2: Coordination	Option 3: Comprehensive framework	Option 4: Regulation
Productivity			
Labour	(+) mild effect on absenteeism and unemployment but not expected to be significant; more effective policies in the workplace through co- and self-regulation	+ improvement in the behaviour of workers, drivers, and other potential alcohol users; higher educational attainment of new entrants into the labour market; education and (on-the-job) training of workers	(+) no direct effect but one through changes in alcohol use and its effects on drink-driving and alcohol abuse among the young
Opportunity costs			
Health care	≈	+ lower incidence of alcohol use across the board; decline in heavy drinking and youth drinking; reduction in alcohol-related traffic accidents	+ decline in heavy drinking; decline in heavy drinking and youth drinking; reduction in alcohol-related traffic accidents; increase in consumption of illicit alcohol in some Member States
Pensions	≈	– longer life expectancy increases the burden on pension funds	(–) most effective on extreme drinkers and the young as well as drivers
Crime and violence	≈ more effective policies but little impact in the area of crime and violence	++ change in behaviour in addition to decrease in use backed up by regulation	(+) strict regulation may elicit non-compliance and stimulate criminal behaviour[21]
Drink driving	≈	+ decline induced by behavioural change supported by regulation to compensate for lower effectiveness of "soft" policy instruments	++ decline but at high public costs
Competitiveness, public revenues, and the alcohol industry			
Competitiveness	≈ modest impact through the greater efficiency of policies and collaboration between stakeholders, including industry	+ lower absenteeism, lower accident-related congestion, more responsible behaviour of workers, all directly targeted by comprehensive policy package; supported by productivity gains	(+) lower use provides benefits to employers but possibly increase public administrative and regulatory costs for taxpayers; stricter regulation may be perceived as a disadvantage in the location and investment decisions of investors

[21] Compare the impact of Prohibition in the USA on the rise of organized crime and the effect of a strict drug policy on petty crime.

Table 25. Impacts relative to the baseline scenario of option 1 per policy domain

	Option 2: Coordination	Option 3: Comprehensive framework	Option 4: Regulation
Public revenues	≈	(+) decline in use through awareness and education, but there is room for industry to profit (i.e. increase sales) through cooperation	+ higher excise duties but still an increase in revenues; a rise in unrecorded consumption may eat into these gains
Performance of the alcohol industry	(+) collaboration and coordination as well as the role of co- and self-regulation provide industry with a degree of leverage	(+) lower alcohol use, but emphasis on responsible behaviour rather than decline in overall use; targeting extreme drinking and youth drinking to the detriment of producers of specialist beverages (e.g. alcopops)	– – ban on alcohol advertising and strict regulation on access, availability and excise taxation will harm the industry
General assessment			
	the efficiency of current policies and interventions is increased with coordination	focus on behavioural aspects of alcohol use more than on use itself improves the potential for a sustainable impact	tackles use more than behaviour and focuses on compliance rather than encouragement

Notes: ≈ = no change relative to the baseline of option 1; – – = very negative; – = negative; (–) = somewhat negative; (+) = somewhat positive; + = positive; ++ = very positive.

6.4.1 A comparison of the four options

On balance, *option 3* appears to provide more benefits than the other two options. It combines "hard" and "soft" instruments, targeting the behavioural foundations of harmful drinking with the latter and reinforcing this with the (cost)effectiveness of the former. The macroeconomic impacts may not be significant relative to the size of the economy or the influence of other variables, but the amounts involved are still substantial.

Option 4 presents a number of clear benefits, for example with respect to drink driving, health care, and public revenues, and it deploys the most (cost)effective policy instruments. Its impact on productivity and competitiveness is somewhat positive, while the regulatory option will most likely harm the alcohol industry and its supplying industries. *Option 2* is mainly a more effective approach to the current set of policies and initiatives, tackling apparent problems of coordination and communication.

6.4.2 Trade-offs and synergies

In Table 25 we have examined the impacts of each option within individual policy domains. These domains do, however, influence each other. Trade-offs occur when the benefits or gains in one area are counteracted by disadvantages or costs in another area. Synergies occur when positive or negative impacts in different domains reinforce each other. The main trade-offs and synergies are:[22]

Trade-offs: Health improvements in the labour force raise the quality of labour and lower the incidence of absenteeism and premature mortality. The same improvements add to the

[22] We have not taken into account the interaction between changes in alcohol use and its harmful and beneficial effects on the one hand and changes in the use and harmful and beneficial effects of other (addictive) substances, such as tobacco.

pressure on pension funds. Moreover, longer life expectancy also means that in the long run more people will require expensive old-age medical treatment, thus raising health care costs. This trade-off will be most pronounced in option 3.

Synergies:

A rise in public revenues provides governments with the opportunity to invest in better public services (e.g. health care; public pensions) and in expensive policy instruments (the "soft" instruments). The best opportunities for this synergy lie in option 4.

Improvements in labour input also provide benefits to the alcohol industry and the public sector. Good economic performance in the alcohol industry will encourage companies to cooperate with Member States and the Commission in promoting alcohol policies. Option 3 –and to a lesser extent option 2– have the strongest synergy in this area.

Productivity and competitiveness benefit from health care improvements (a decline in alcohol-related disease and death and a reallocation of resources to other health problems), the psychosocial or human capital benefits of a reduction in crime and violence, and gains in the area of drink-driving. Overall, option 3 outperforms the other options in this type of synergy.

CHAPTER 7 Monitoring and evaluation

This chapter outlines how the European Commission may wish to plan arrangements to monitor and evaluate the progress and success of the proposed alcohol policies. As stated in the EC Impact Assessment Guidelines (SEC (2005) 8 June 2005) the road map for monitoring progress should "set measurable indicators to cover both the quality of outcomes and the implementation process, and define plans for evaluation."

There are many challenges in establishing arrangements to monitor and evaluate policy objectives. The three most important ones are that:

Many impacts are not easily quantifiable.

There maybe significant time lags between the intervention and benefits (or costs).

It is difficult to attribute a policy intervention to a particular impact.

At the same time, it is increasingly acknowledged that doing nothing is not an option and, consequently, governments are increasingly establishing monitoring and evaluation systems. Evaluation of European Union activities is essential and a legal requirement. Organisations that undertake monitoring and evaluation activities must develop skills in-house, or develop the capacity to commission them from elsewhere.

An effective communications policy needs clear objectives and targets, and the attainment of or progress towards targets should be monitored and evaluated at EU, national and local levels. Monitoring and evaluation should give feedback to political decision makers, administrators, and everyone who is responsible for the implementation of the related policies. They need the information to develop, update or restructure the policy and its components, as well as to assess the instruments of implementation. Monitoring indicators are also useful for international comparison and evaluation.

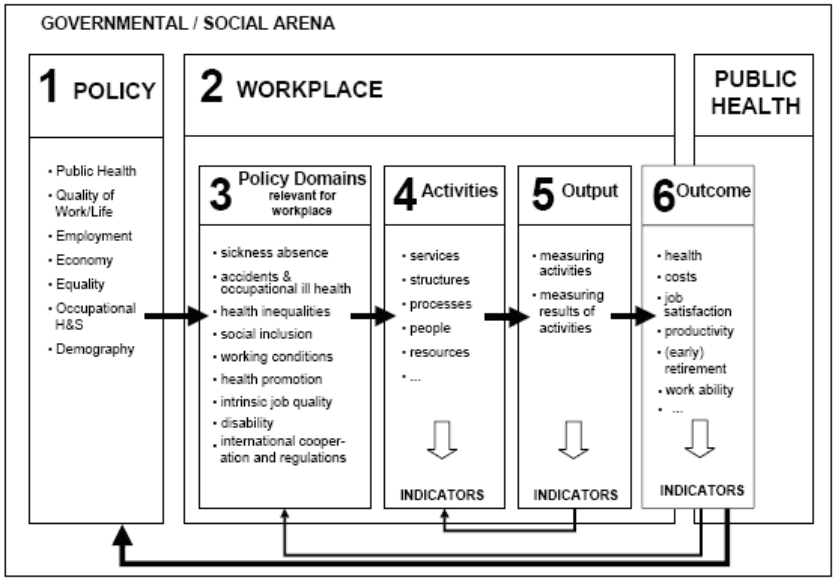
7.1 Monitoring

The OECD has defined monitoring as "a continuous function that uses the systematic collection of data on specified indicators to provide management and the main stakeholders of an ongoing development intervention with indicators of the extent of progress in the use of allocated funds". (Kusek and Rist 2004)

The main policy objective is to "reduce the health and social harm due to alcohol consumption and thereby contribute to higher productivity and a sustainable economic development in EU in line with the objectives set out in the Lisbon Strategy". Table 26 presents economic indicators that could be applied to the monitoring of the stated specific and operational objectives as outlined in the European Commissions communication on alcohol policy scoping paper. Establishing clear objectives and indicators is the first stage of putting in place a good quality monitoring system. Further systematic collection of monitoring data should start at the beginning

of policy implementation. The experience gained from the monitoring and evaluation of progress implies that the number of indicators should be small to facilitate the obtaining of data from the maximum number of Member States and to allow annual updating of data. (Anderson and Lehto 1995) Figure 20 gives an example of a model for the selection and classification of indicators for monitoring.

Figure 20. The policy cycle model of work-related health monitoring from a public health



Source: Kreis and Bödeker 2004.

Data for potential economic indicators could come from sources such as:

General household surveys to measure purchases of alcohol by households

Price statistics to chart the development of the absolute and relative price of alcoholic beverages

Police and customs authorities statistics on crime, violence, and other associated problems

Statistics on enforcement, government control, smuggling, and unrecorded consumption

Public revenue and tax statistics to measure the revenue of excise taxes on alcohol and the income from state alcohol enterprises

Enterprise statistics and market analyses to measure alcoholic beverage production and turnover, wholesale and retail sales, company turnover, and other microeconomic developments

Statistics on international trade outside and inside the European Union

Statistics on the production and sale of raw materials, semi-manufactures, and intermediate services, such as yeast, hops, distilling equipment, and advertising.

The literature may also provide relevant data, for example on the economic costs of alcohol-related health and social problems, but this source is unlikely to provide a steady supply of consistent and reliable data.

Table 26. Monitoring indicators for European Union alcohol policies

	Economic Indicators
Specific Objectives	
Drink-driving: achieve sustainable reduction in alcohol related road fatalities and injuries	• Value of property damage (e.g. car repairs and purchases) due to drink driving • Total value of fines/penalties related to drink-driving • Law enforcement costs (police, processing offenders) • Total cost of alcohol related road fatalities and injuries or accidents • Government expenditure on drink-driving campaigns
Under-age drinking: reduce under-age drinking, postpone the age at which	• Amount spent on alcoholic beverages by under-age drinkers • Fines related to under-age drinking
Hazardous and harmful drinking: reduce alcohol-related acute and chronic disorders	• Health care costs and expenditure (e.g. ambulances and treatment) related to alcohol-related morbidity and mortality • Cost of enforcement on-premise regulations • Server liability fines • Value of alcohol-related insurance claims • Increase in insurance premiums attributable to alcohol • Cost of alcohol-related work absenteeism and unemployment, or alcohol-related accidents at work, and lost productivity from loss of life • Value of lives lost/saved due to alcohol drinking • Sickness and pension insurance costs due to alcohol related diseases
Families and children: encourage and support Member States efforts to reduce alcohol-related violence and harm in families	• Weekly household expenditure on alcohol drink
Violence: encourage and support Member States efforts to create a safer drinking environment, especially in city centres, pubs and bars	• Expenditure and cost of crime prevention, detection, processing, and imprisonment (i.e. law enforcement)
Economic development: support Member States efforts to improve workers' health and safety and to ensure better protection of young people at work	
Operational Objectives	
Commercial communication: reduce exposure of young people in commercial communication, and ensure that such communication does not target young people or encourages excessive or harmful use of alcohol	• Revenues and expenditure by alcohol industry on advertising, promotion and sponsorship • Advertising controls enforcement costs
Consumer information: improve awareness and information of risks connects to the consumption of alcoholic beverage, especially during pregnancy, while driving and at workplaces and improve information on added ingredients and the caloric value of alcoholic beverages	• Additional cost to manufacturers as a result of information labelling • Market share (revenues) by alcoholic drink • Alcoholic industry sales revenue by market share

Cross border trade/taxation: facilitate the functioning of the internal market by increasing the minimum rates of excise duties in line with inflation, and contribute to closer approximation of the rates of excise duty on alcoholic beverages in the Community in order to reduce smuggling and fraud related to cross border alcohol trade and transport.	• Level of excise duty in EU member states • Excise revenues in EU member states • Value for imports and exports in alcohol industry • Amount of foreign investment into alcohol industry (production or supply) for Member States
Treatment: Promote the widespread implementation of brief advice programmes throughout the healthcare sector and particularly in primary health care as well as in accident and emergency departments	• Cost of alcohol-related advice programmes
Collection of Information: deliver comparable data on alcohol consumption and the effects of alcohol and alcohol policy measures	• Cost of compliance with member state and self-regulation
Other indicators	• Recorded total consumption of alcohol per head • The sum of recorded and estimated unrecorded total consumption of alcohol per head. • Level of employment and unemployment in alcohol industry

7.2 Evaluation

The OECD has defined evaluation as "the systematic and objective assessment of an ongoing or completes project, programme, or policy, including its design, implementation and results. The aim is determine the relevance and fulfilment of objectives, development efficiency, effectiveness, impact and suitability. An evaluation should provide information that is credible and useful, enabling the incorporation of lessons learned in the decision making process of both recipients and donors." (Kusek and Rist 2004) Arrangements for policy evaluation should be planned at the stage of impact assessment.

Decision makers in public health policy require evidence and evaluations both to demonstrate their past accomplishments and to improve their future decisions. Such evaluations must be sensitive to the complexities created by multi-agency interventions and should accommodate the various perspectives and knowledge bases of the multiple players involved in delivering the policy. Consequently, for conventional evaluation, there are significant problems of measuring outcomes, attributing outcomes, and assessing the counterfactual. Similarly, assessing a specific policy's sustainability can be difficult.

Evidence for evaluation should be 'co-produced' but it should be collected within categories that allow for aggregation and comparison. For example, evaluating the extent to which a single policy or group of policies has met intended (or unanticipated) outcomes depends upon being able to categorise outcomes in a systematic way. Second, the evaluation approach should create a learning and adaptive system in which evaluation is used as a continuing support for decision-makers.

The evaluation should (1) assess the impact of each policy in the EU and at other levels (national and local); (2) assess the efficiency of resource use; and (3) assess how consistently and how well the policy interventions complement other relevant government, industry or community programmes, actions, and initiatives.

We suggest the following criteria to evaluate a potential policy's impacts:

i. **Relevance:** To what extent are the policy objectives pertinent in relation to the evolving needs and priorities in the policy field (or of the target population)?

ii. **Effectiveness and sustainability:** To what extent have the policy's impact contributed to meeting near-term and long-term policy objectives?

iii. **Efficiency:** How economically have the various inputs been converted into outputs (and outcomes)?

iv. **Consistency:** To what extent is consistency and complementarity ensured between policy actions and other policies and activities?

v. **Acceptability:** To what extent do the policy's intended or unintended impacts concur with the interests of all stakeholders?

This requires (1) examining the logical framework of a single policy or group interventions that have been adopted by EU member states as a result of Communication; (2) defining evaluation criteria and evaluation questions; (3) collecting evidence on the impacts, management procedures and quality of the implementation process; and (4) using the evidence and the evaluation framework to formulate and validate conclusions and recommendations.

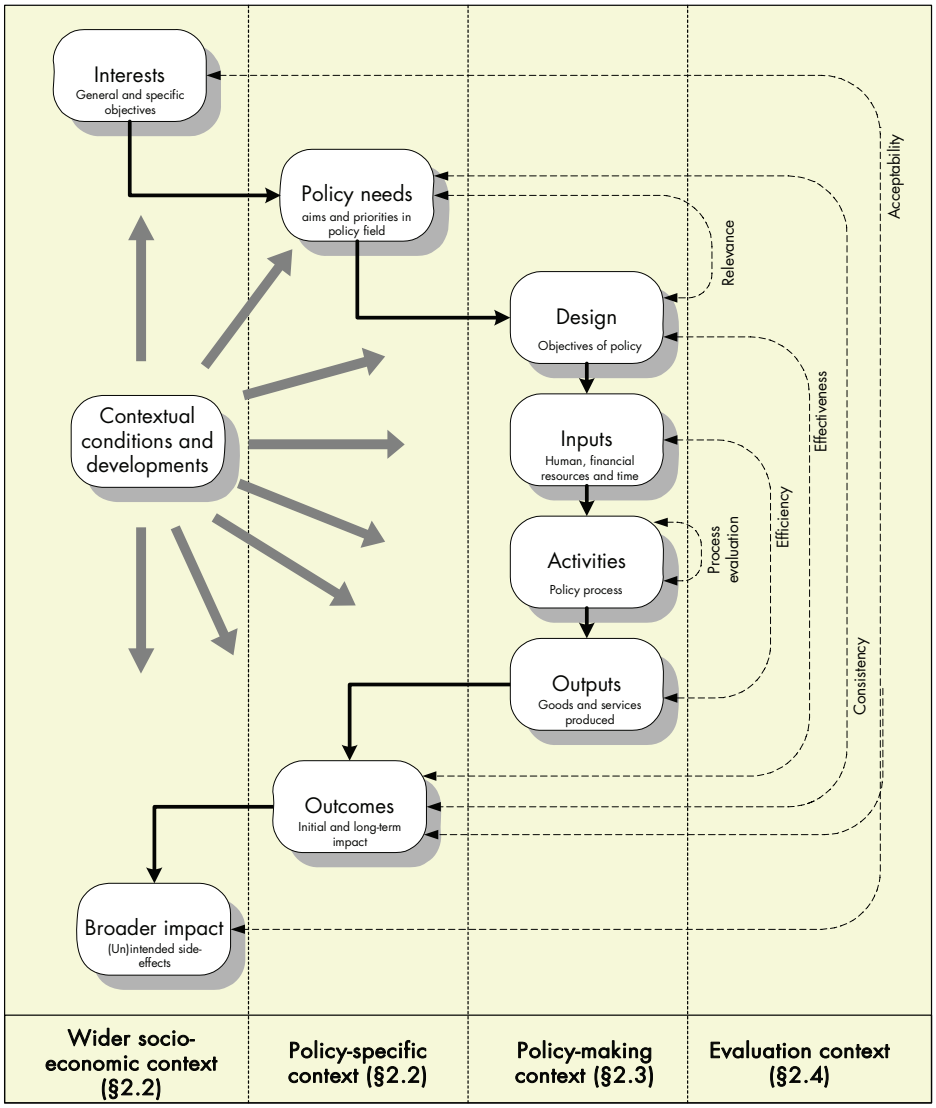
The evaluation of policy interventions is multi-dimensional, involving different *levels* (European, national and local levels) and *stages* (input-process-output). A logic model, which is widely used in evaluation, can help understand input-process-output relationships.

Figure 21 provides an overview of the different stages and levels in the development and implementation of a policy. The boxes identify the potential focal points of the evaluation and the possible measures of success (i.e. evaluation criteria). Each measure has a distinct information demand. Assessment of effectiveness, for instance, involves a comparison of the outcomes and the initial aims of the policy (i.e. design phase). For the establishment of an evaluation framework, this requires delineation of (proxy) indicators measuring outputs and outcomes. Evaluation criteria are defined specific to the policy intervention that will be evaluated. These criteria can be quantitative or qualitative.

Success is the crucial measure of evaluation. However, the measurement of success depends upon the viewpoint taken. Different stakeholders may have different viewpoints. First, there may be differences in opinion as to how the policy should perform with respect to a single criterion. Second, stakeholders may focus on different criteria for success. With respect to these different criteria, the evaluation should examine the extent to which the effects match the goals, needs and interests, the relevance of the policy objectives, and the quality and efficiency of the process.

Figure 21 also distinguishes different levels related to policy development and implementation: from the wide socio-economic context to the specific policy-making context. In evaluating the impact of a policy, the activities at a lower level will have to be logically correlated to goals or desires at a higher level. Conversely, in order to understand the impact at higher levels, knowledge of activities at lower levels is required to attribute success to policy interventions. Furthermore, it is important to distinguish external factors from (policy-related) input factors. External factors (defined as contextual conditions and developments) affect the functioning of the policy intervention, but lie outside the span of control of the policy intervention (e.g. economic development or population ageing). Changes in external factors may lead to effects that cannot be attributed to policy activities. On the other hand, predictable external factors (e.g. population trends) should be considered in policy development and implementation. The input factors related to the policy lead to outputs, which a wide range of stakeholders and society as a whole may take up, leading in turn to the outcomes and broader impacts of the policy.

Figure 21. Elements in policy evaluation



CHAPTER 8 Conclusions

Average per capita alcohol consumption remains an issue, because alcohol affects health at any level of use. The key issues, however, are:

Heavy and hazardous drinking, which involves as many as 58 million Europeans.

Rising youth alcohol use and drunkenness.

A persistence of irresponsible behaviour, such as drinking while driving or working.

We have made a distinction between use and behaviour, arguing that the two are inherently different. On the other hand, they are intricately connected and policies generally affect both. The distinction is relevant, because in order to achieve a sustained decline in harmful effects policies to lower use must be combined with efforts to imprint the benefits of responsible drinking behaviour on European consumers.

The economic importance of the alcohol industry

The alcohol industry is a large and elaborate industry with extensive forward and backward linkages. The value chain of alcohol production involves a host of economic activities. Any change in alcohol consumption will affect the manufacturers of alcoholic beverages as well as their suppliers and clients throughout the value chain.

Detailed data on sectoral economics are regrettably scarce. We have combined the available data and made supplementary estimates on employment and value added. Beer, wine and spirits together contribute approximate €45 billion and 1.2 million jobs to the economy of the European Union (not including the catering industry) and less than 1% to EU exports. Hence, it only makes a modest contribution to the EU economy, although the numbers concerned are quite substantial.

Macroeconomic impacts of an alcohol policy

Alcohol use affects four key macroeconomic issues: total output, productivity, competitiveness, and opportunity costs.

- **Total output**: The measurement of growth, productivity and competitiveness –three key issues in macroeconomic analysis–only concerns tangible costs. The harmful effects of human behaviour are captured implicitly, for example through their impact on labour productivity.
- **Productivity**: The relationship between total output or value added and the use of production factors involves the quantity and quality of labour, the quantity and quality of capital, the ratio of capital to labour and the efficiency of production. The main impacts on labour relate to:
    - Lower efficiency when at work, both as individuals and when functioning within a group
    - Lower quality of worker ability due to poor health or a deficient education

  - Loss of workers (lowering the quantity of labour input), permanently due to death, temporarily due to illness and absenteeism, or either temporarily or permanently due to unemployment

- **Opportunity costs**: The money spent on alcohol-related health care, traffic accidents, crime, and other effects might be used more productively elsewhere in the economy. National costing studies may give a good indication of the amount of resources involved, but this amount is not a good indication of the level of opportunity costs. Policy will (at least initially) only lower variable costs and the public services involved (health care, social security, law enforcement) have a consistent lack of capacity. Resources might instead be reallocated to alternative uses within the public sector, perhaps with a higher social utility. Possible opportunity costs concern expenditure on health care, law enforcement, traffic accidents, insurance, and pension funds.
- **Competitiveness**: Alcohol use affects competitiveness through productivity by lowering the quality and efficiency of the work of alcohol-using employees and by raising wage costs per unit of output as absent workers do not produce but have to be paid regardless. In addition, additional alcohol-induced unemployment can raise the fiscal burden on businesses as social security expenditure rises and the tangible costs of alcohol use may crowd out public investments in the business infrastructure.

An impact assessment of the four policy options

The purpose of an ex ante impact assessment is to consider what will happen in the future if different policy options are adopted. In our analysis, we have moved from the conceptual approach to the final assessment of the policy options in three steps:

Step 1 – Stakeholder analysis

Stakeholder analysis shows that the most likely and influential supporters of a new alcohol policy are the central government, national institutes and organisations responsible for coordinating national activities in alcohol research, prevention and treatment, the criminal justice system and NGOs. The alcohol industry is the most likely opponent, even though its position will depend on the impact of the proposed policy on its (future) economic performance.

Step 2 – A qualitative and, where possible, quantitative analysis of the impacts of policy in individual domains

- The macroeconomic impacts of a decline in absenteeism, unemployment and premature mortality are not likely to be significant. The impacts may still involve several billion euros across the EU25, giving an alcohol policy absolute value even when it does not have a significant relative effect on growth rates, productivity or competitiveness.
- The opportunity costs of alcohol-related morbidity and mortality relate mainly to the potential benefits of a reallocation of resources within the health care sector.
- A reduction in alcohol-related premature mortality would have an effect on pension funds but it would not be very significant.
- A decline in the harmful effects of alcohol use would lead to an immediate saving through a reduction in property damage. The same decline would lead to lower prevention and insurance costs but with a time lag. The money spent on law enforcement and the police on the effects of alcohol-related crime and violence include high fixed costs that would be redirected to other crimes rather than reallocated to productive purposes.
- A decline in drink driving and alcohol-related traffic accidents would free resources at the expense of the value added generated by car manufacturers, car repair companies, and

rescue and emergency services. Time savings would yield economic gains mainly through the amount of time involved in transporting freight and other production-related transport.

- A reduction in alcohol-related morbidity, mortality, traffic accidents, and crime will in time translate into lower insurance premium unless the specific risks had already been internalized. The macroeconomic impact is unlikely to be significant.
- A rise in excise duties would cause total alcohol consumption to fall and public excise revenues to increase. Excise duties alone are not sufficient to achieve a sustained decline in alcohol use or an associated change in harmful behaviour, but they can be effective with respect to particular groups of consumers, most notably heavy drinkers and young drinkers. Excises may be an effective instrument for curbing alcohol use, but they cannot be the only instrument. A more comprehensive approach is necessary.

Step 3 – Aggregate analysis and comparison of the four options, including the identification of trade-offs and synergies

A first, high-level comparison of the four options suggests that:

- Option 1 will not result in a decline in the harmful effects of alcohol use.
- Option 2 will probably be a more efficient version of option 1, but without a structural improvement in alcohol policy.
- Option 3 is potentially the most efficient and effective approach in that it combines policies intended to lower alcohol use with activities aimed at behavioural change.
- Option 4 will lower alcohol use through stricter regulation and enforcement, but that without a supporting information and education campaign, changes in use may not become engrained in consumer behaviour.

A comparison of the impacts of the four options across all policy domains related to macroeconomic and sectoral impacts resulted in an assessment of the marginal impact of options 2, 3, and 4 relative to the impacts of option 1.

On balance, *option 3* appears to provide more macroeconomic and sectoral benefits than the other two options. It combines "hard" and "soft" instruments, targeting the behavioural foundations of harmful drinking with the latter and reinforcing this with the (cost)effectiveness of the former. The macroeconomic impacts may not be significant relative to the size of the economy or the influence of other variables, but the amounts involved are still substantial. *Option 3* also performs better than the other options in the opportunities for synergy, even though *option 4* has a distinct advantage with respect to public revenues and its uses.

Option 4 presents a number of clear benefits, for example with respect to drink driving, health care, and public revenues. Its impact on productivity and competitiveness is somewhat positive, while the regulatory option will most likely harm the alcohol industry and its supplying industries. *Option 2* is mainly a more efficient approach to the current set of policies and initiatives. Yet, our main conclusion is that option 3 dominates the other options.

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Appendix 1: Assessment of effectiveness and cost-effectiveness of policies

Table 27. Policy action countermeasures with effectiveness ratings

Operational objectives \ Specific objectives		Drink driving	Under-age drinking	Hazardous & harmful drinking	Families & children	Violence	Economic development
Regulation & enforcement	**Taxation**						
	Advertising	• Reducing the volume of advertising (+/++) • Advertising content controls (?)	• Reducing the volume of advertising (+/++) • Advertising content controls (?)	• Reducing the volume of advertising (+/++) • Advertising content controls (?)			
	Other regulation	• Lowered BAC levels (+++) • License suspension (+++) • Graduated licensing (++) • Density of outlets (++) • Number of outlets (++) • Hours and days of sale (++) • Server liability (+++)	• Low BAC for youth (+++) • Minimum drinking age (+++) • Density of outlets (++) • Hours and days of sale (++) • Number of outlets (++)	• Government retail outlets (+++) • Number of outlets (++) • Density of outlets (++) • Hours and days of sale (++) • Server liability (+++)		• Density of outlets (++) • Hours and days of sale (++) • Server liability (+++) • Number of outlets (++)	

Table 27. Policy action countermeasures with effectiveness ratings

Operational objectives \ Specific objectives		Drink driving	Under-age drinking	Hazardous & harmful drinking	Families & children	Violence	Economic development
	Enforcement	• Random Breath testing (RBT) (+++) • Alcohol locks (+)	• Active enforcement (++) • Enforcement of on-premise regulations (++)	• Active enforcement (++) • Enforcement of on-premise regulations (++)		• Active enforcement (++)	
Information, awareness, training & education	**Community**	• School based education courses (for reducing drink driving) (?/O) • Community programmes (about drink driving) (++) • Public service messages (O) • Community mobilization (++)	• Alcohol education in schools (O/+) • Public service messages (O)	• Public service messages (O) • Community mobilization (++) • Alcohol education in schools (O/+)	• Public service messages (O)	• Community mobilization (++)	
	Individual	• Server training and civil liability (+) • Designated drivers and ride services (O) • Warning labels (O)	• Server training and civil liability (+)	• Warning labels (O) • Server training and civil liability (+)	• Warning labels (O)	• Server training and civil liability (+)	• Server training and civil liability (+)
	Social responsibility	• Server training and civil liability (+) • Designated drivers and ride services (O) • Responsible beverage service (+)		• Responsible beverage service (+) • Safe bar/environment/containers (?) • Designated drivers and ride services (O)		• Public transport (?)	• Server training and civil liability (+)

Table 27. Policy action countermeasures with effectiveness ratings

Operational objectives \ Specific objectives		Drink driving	Under-age drinking	Hazardous & harmful drinking	Families & children	Violence	Economic development
Treatment		• Brief interventions in accident & emergency departments (++)		• Brief interventions in primary care (+++) • Brief interventions in accident & emergency departments (++)	• Pregnancy based programmes (+) • Social welfare based programmes (+) • Brief interventions in accident & emergency departments (++)	• Social welfare based programmes (+) • Brief interventions in accident & emergency departments (++)	• Work based programmes (++)

The effectiveness criterion refers to the scientific evidence demonstrating whether a particular strategy is effective in reducing alcohol consumption, alcohol-related problems or their cists to society. The following rating scale was used:
O Evidence indicates a lack of effectiveness
+ Evidence for limited effectiveness
++ Evidence for moderate effectiveness
+++ Evidence of a high degree of effectiveness
? no studies have been undertaken or there is insufficient evidence upon which to make a judgement.
Source: Anderson and Baumberg 2006.

Table 28. Policy action countermeasures with cost efficiency ratings

Operational objectives \ Specific objectives		Drink driving	Under-age drinking	Hazardous & harmful drinking	Families & children	Violence	Economic development
Regulation & enforcement	**Taxation**	• Taxes (+++)	• Taxes (+++)	• Taxes (+++)	• Taxes (+++)	• Taxes (+++)	• Taxes (+++)
	Advertising	• Reducing the volume of advertising (++) • Advertising content controls (++)	• Reducing the volume of advertising (++) • Advertising content controls (++)	• Reducing the volume of advertising (++) • Advertising content controls (++)	• Reducing the volume of advertising (++) • Advertising content controls (++)	• Reducing the volume of advertising (++) • Advertising content controls (++)	
	Other regulation	• Lowered BAC levels (+++) • License suspension (++) • Graduated licensing (+++) • Government retail outlets (+++) • Density of outlets (+++) • Hours and days of sale (+++) • Server liability (+++) • Number of outlets (+++)	• Low BAC for youth (+++) • Minimum drinking age (++) • Density of outlets (+++) • Hours and days of sale (+++) • Number of outlets (+++)	• Government retail outlets (+++) • Number of outlets (+++) • Density of outlets (+++) • Hours and days of sale (+++) • Server liability (+++) • Lowered BAC levels (+++) • Low BAC for youth (+++) • Minimum drinking age (++)		• Density of outlets (+++) • Hours and days of sale (+++) • Server liability (+++) • Number of outlets (+++)	

Table 28. Policy action countermeasures with cost efficiency ratings

Operational objectives \ Specific objectives		Drink driving	Under-age drinking	Hazardous & harmful drinking	Families & children	Violence	Economic development
	Enforcement	• Random Breath testing (RBT) (+) • Alcohol locks (+) • Enforcement of on-premise regulations (+)	• Active enforcement (+) • Enforcement of on-premise regulations (+)	• Active enforcement (+) • Enforcement of on-premise regulations (+)		• Active enforcement (+)	• Active enforcement (+) • Enforcement of on-premise regulations (+)
Information, awareness, training & education	**Community**	• School based education courses (for reducing drink driving) (+) • Community programmes (about drink driving) (+) • Public service messages (++) • Community mobilization (++)	• Alcohol education in schools (+) • Public service messages (++)	• Public service messages (++) • Community mobilization (++) • Alcohol education in schools (+)	• Public service messages (++)	• Community mobilization (++)	
	Individual	• Server training and civil liability (+) • Designated drivers and ride services (++) • Warning labels (+++)	• Server training and civil liability (+)	• Warning labels (+++) • Server training and civil liability (+)	• Warning labels (+++)	• Server training and civil liability (+)	• Server training and civil liability (+)

Table 28. Policy action countermeasures with cost efficiency ratings

Operational objectives \ Specific objectives		Drink driving	Under-age drinking	Hazardous & harmful drinking	Families & children	Violence	Economic development
	Social responsibility	• Server training and civil liability (+) • Designated drivers and ride services (++) • Responsible beverage service (++)		• Responsible beverage service (++) • Safe bar/environment/containers (++)		• Public transport (+)	• Server training and civil liability (+)
Treatment		• Brief interventions in accident & emergency departments (++)		• Brief interventions in primary care (+) • Brief interventions in accident & emergency departments (++)	• Pregnancy based programmes (+) • Social welfare based programmes (+) • Brief interventions in accident & emergency departments (++)	• Pregnancy based programmes (+) • Social welfare based programmes (+) • Brief interventions in accident & emergency departments (++)	• Work based programmes (+)

Table 28. Policy action countermeasures with cost efficiency ratings

Specific objectives / Operational objectives	Drink driving	Under-age drinking	Hazardous & harmful drinking	Families & children	Violence	Economic development
The cost-efficiency criterion seeks to estimate the relative monetary cost to the state to implement, operate and sustain this strategy, regardless of effectiveness. For instance, increasing alcohol excise duties does not cost much to the state but may be costly to alcohol consumers. In this criterion, the lowest possible cost is the highest standard. Therefore, the higher the rating, the lower the relative cost to implement and sustain this strategy. The following scale was used: O Very high cost to implement and sustain + Relatively high cost to implement and sustain ++ Moderate cost to implement and sustain +++ Low cost to implement and sustain ? There is no information about cost or cost is impossible to estimate Source: Anderson and Baumberg 2006.						