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# The affordability of alcoholic beverages in the European Union

Understanding the link  
between alcohol affordability,  
consumption and harms

Lila Rabinovich, Philipp-Bastian Brutscher,  
Han de Vries, Jan Tiessen,  
Jack Clift, Anais Reding

Prepared for the  
European Commission DG SANCO

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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 15213-2665  
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# Preface

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Alcohol has historically been consumed in an unproblematic way by many people across the European Union (EU). However, a significant proportion of alcohol consumption is problematic and generates harms for individuals and societies. Europe has the highest proportion of drinkers and the highest levels of alcohol consumption per population in the world. The high levels of alcohol consumption recorded in the EU have been linked to a number of public health and other problems, including violence and crime, diseases such as liver cirrhosis, lost productivity and absenteeism, family breakdown and accidental deaths.

In spite of extensive evidence that raising alcohol prices reduces consumption on a societal level, the trend is that the real price of alcoholic beverages and the real value of alcohol taxation are decreasing across the EU.

Against this background DG SANCO commissioned RAND Europe to conduct a study of the affordability of alcohol products across the EU, and of the potential impacts of affordability on harmful use of alcohol. On this basis, the study is intended to provide evidence on whether alcohol affordability could be a useful policy lever to public authorities seeking to reduce harmful alcohol consumption in Europe. In order to do this, the study: 1) examines the link between the affordability of alcoholic beverages, alcohol consumption and alcohol-related harms; 2) examines the impact of cross-border tax-driven or competition-driven price differentials; and 3) investigates the policy levers that can influence the affordability of alcohol, by providing an overview of current alcohol pricing policies in place across the EU.

The main findings of this study are as follows:

- The real value of the EU alcohol minimum excise duty rates, and of Member States' (MS) alcohol taxation, has decreased since the mid-1990s in most EU countries;
- Alcoholic beverages have become more affordable in most EU countries since the mid-1990s – in some countries by over 50%;
- There is a positive relationship between alcohol affordability and alcohol consumption in Europe;
- There is a positive relationship between alcohol consumption and three types of harms, namely traffic injuries, traffic deaths and liver cirrhosis;

- Cross-border alcohol consumption due to tax (and price) differentials can lead to increases in alcohol consumption in the higher-price country and increases in alcohol harms.

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For more information on RAND Europe or this document, please contact:

Lila Rabinovich  
RAND Europe  
Westbrook Centre  
Milton Road  
CB4 1YG Cambridge  
UK  
Tel: + 44 1223 353 329  
Email: [lilar@rand.org](mailto:lilar@rand.org)

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## List of acronyms

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ABV	alcohol by volume
Alko	Finnish State Alcohol
AMPHORA	Alcohol Measures for Public Health Research Alliance
BAL	blood alcohol limit(s)
BBPA	British Beer and Pub Association
CAP	Common Agricultural Policy
EC	European Commission
ECJ	European Court of Justice
EEA	European Economic Area
EEC	European Economic Community
EFTA	European Free Trade Association
ESPAD	European School Survey on Alcohol and Other Drugs
EU	European Union
GDP	gross domestic product
HICP	Harmonised Index of Consumer Prices
IHD	ischaemic heart disease
MS	Member State(s)
NGOs	non-governmental institutions
NHS	National Health Service
PPP	purchasing power parity
SoRAD	Swedish Centre for Social Research on Alcohol and Drugs
STAKES	National Research and Development Centre for Welfare and Health (Finland)

STIVA	Dutch Foundation for the Responsible Use of Alcohol
WHO	World Health Organisation

## Executive summary

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The European Commission (EC) commissioned RAND Europe to conduct a study on the affordability of alcohol products across the EU, and on the potential impacts of affordability on harmful use of alcohol. On this basis, the study is intended to provide evidence on whether alcohol affordability could be a useful policy lever to public authorities seeking to reduce harmful alcohol consumption in Europe. This section highlights some of the main findings of the research.

### **There is increasing pan-European interest in developing and implementing measures to combat alcohol harms**

Alcohol is an important economic commodity in Europe, creating jobs, generating fiscal revenues in the form of alcohol taxes, and contributing around €9 billion to the EU's economy through trade. But while alcohol has been, and continues to be, consumed in an unproblematic way by many people, a significant proportion of alcohol consumption is problematic and generates harms for individuals and societies. Alcohol is the third leading risk factor for death and disability in the European Union (EU) after tobacco and high blood pressure. Europe has the highest proportion of drinkers and the highest levels of alcohol consumption per head of the population in the world, with total alcohol consumption averaging eleven litres of pure alcohol a year per adult. These high levels of alcohol consumption recorded in the EU have been linked to a number of public health and other problems, including violence and crime, diseases such as liver cirrhosis, lost productivity and absenteeism, family breakdown and accidental death. Through these harms, alcohol misuse generates high costs to society. It was estimated that the costs in the EU of alcohol misuse was around €125 billion in 2003, equivalent to 1.3% of gross domestic product (GDP). This exceeds by an order of magnitude the reported contribution (about €9 billion) of the alcohol industry to the EU economy.

### **There has been a decline in the real value of alcohol excise duty rates across the EU**

The real value of excise duty rates for most alcoholic beverages has gone down since 1996 in the vast majority of EU Member States. Notable exceptions are the UK and Italy, which have seen an increase in the real value of excise duty rates for beer; with an increase for wine too in the UK. There has also been a decline in the EU minimum excise duty rates in real terms for alcoholic beverages since 1992 as they have not been adjusted for inflation.

### **There is a trend across the EU towards more off-trade alcohol consumption**

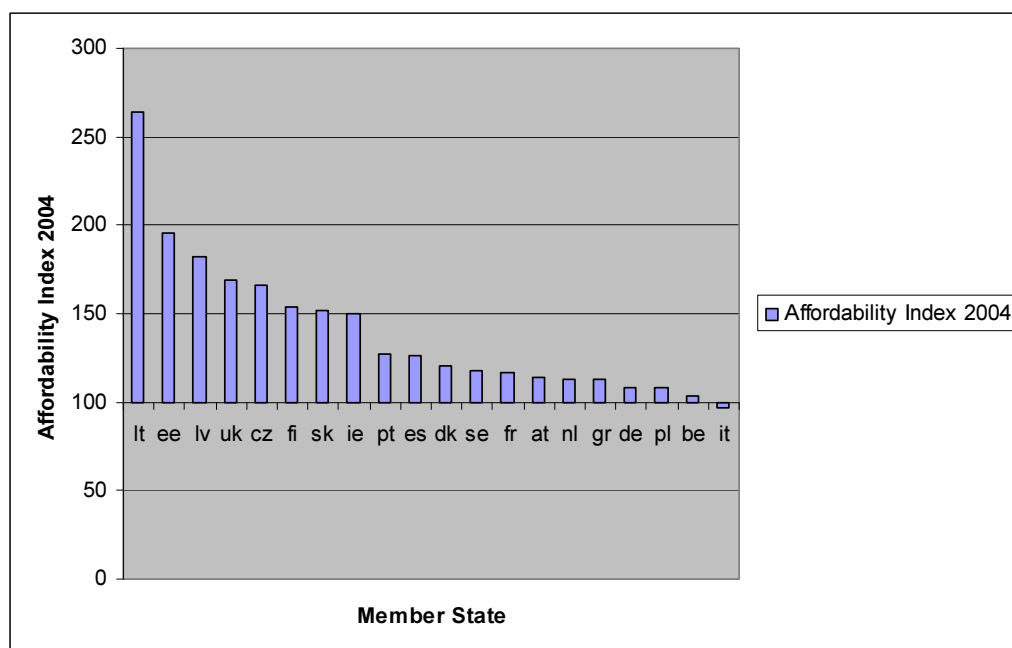
There is a trend across the EU towards more off-trade alcohol consumption, which tends to be cheaper than alcohol sold on-trade. On-trade refers to pubs, clubs, restaurants and

other retailers selling alcohol for consumption within the venue. Off-trade refers to supermarkets and off-licences, selling alcohol for consumption elsewhere. These are also referred to as on-premise and off-premise sales of alcohol. In countries such as the UK, Sweden, Finland, Latvia, Ireland and The Netherlands, off-trade alcohol sales appear to be growing relative to on-trade. This is true even in those countries in which the market share of the on-trade has traditionally been larger, such as Ireland and The Netherlands.

Although there is little research examining this particular question, it is possible that one of the main reasons for the increase in off-trade alcohol consumption is the lower prices of alcohol in the off-trade retailing. In many of the countries mentioned above, alcohol prices in the off-trade appear to be decreasing relative to on-trade prices.

### Alcohol has become more affordable across the EU since 1996

The affordability of alcohol is a composite measure looking at the net effect of price and income. The affordability of alcoholic beverages has increased in all countries examined, apart from Italy; that is, in nearly all countries examined alcohol has become more affordable over the last twelve years.<sup>1</sup> In six countries (Lithuania, Estonia, Latvia, Finland, Slovakia and Ireland) affordability of alcohol increased by 50% or more. The figure below shows the change in affordability of alcohol since 1996 for the twenty countries for which data are available.



<sup>1</sup> The fact that the affordability of alcohol in Italy has actually decreased over the time period studied here may reflect changes in alcohol consumption in the country in the last few decades. Overall alcohol consumption has declined considerably since the 1970s in Italy, traditionally a wine-drinking country, driven primarily by a decline in wine consumption (Simpura 1998). As a result, it has been argued that a response from the wine industry has been to switch from the production of cheaper wines (which were a 'necessity' for Italian consumers who used to drink wine with their meals) to the production of more expensive, luxury wines (A. Allamani, personal communication), thus leading to a decrease in the affordability of alcohol.



SOURCE: Eurostat, author calculations

**Figure 1: Changes in the affordability of alcohol between 1996 and 2004, selected EU countries**

Our analysis indicates that across the EU, 84% of the increase in alcohol affordability was driven by increases in income, and only 16% was driven by changes in alcohol prices.<sup>2</sup> This is primarily because while incomes went up considerably across the EU, the relative price of alcoholic beverages has remained relatively stable, or fallen at a lower rate than the income increases, in most of the EU countries included in this analysis.

### **There is a positive relationship between alcohol affordability and alcohol consumption in the EU**

The balance of existing evidence indicates that there is a negative relationship between alcohol price and consumption, and a positive relationship between income and consumption. In accordance with these findings, our own analysis indicates that there is a statistically significant positive relationship between alcohol *affordability* (a composite measure looking at the effect of price and income) and consumption across the EU. More specifically, we find a short run elasticity of 0.22 and long-run elasticity of 0.32 (suggesting a total increase in consumption of 0.32% following a 1% increase in affordability). These elasticities are symmetrical; i.e. a 1% increase in affordability in the short-run has the same effect as a 1% decrease in affordability in the short-run.

This additional evidence on the positive association between affordability and consumption in Europe contributes to the growing understanding of the way in which drinkers respond to changes in how affordable alcoholic beverages are. The body of research on this issue contributes to an evidence base on alcohol pricing policy.

### **There is a positive relationship between alcohol consumption and three types of harms: liver cirrhosis, traffic injuries and traffic deaths**

Our analysis suggests positive, statistically significant associations between alcohol consumption and three indicators of harm: fatal traffic accidents, (non-fatal) traffic injuries and liver cirrhosis. More specifically, we find that a 1% increase in per capita alcohol consumption is associated with an increase of 0.85% in fatal traffic accidents, 0.61% in traffic injuries, and 0.37% in the incidence of liver cirrhosis within the same year. We do not find a statistically significant association between alcohol consumption and homicide at the aggregate level.

Our findings support those of existing research on the link between alcohol consumption and these three types of harms. As discussed earlier in this chapter, there is substantial and robust evidence for this association, to which our own analysis contributes.

Our evidence - in combination with the existing body of research on the link between alcohol price/income/affordability and consumption, and on the direct link between alcohol price/income and harms - provides strong support for the use of alcohol pricing

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<sup>2</sup> The calculation is based on a double-log regression of the affordability index on the price index and income index – suppressing the constant term.

policies as a potentially effective measure to curb hazardous and harmful drinking in Europe.

### **Cross-border alcohol shopping for personal use has negative implications for the 'importing' country**

We conducted three case studies on cross-border alcohol consumption for personal use. The case studies were: UK-France, Finland-Estonia, and Sweden-Denmark-Germany. In all these examples there are significant differences in alcohol taxation and price between the countries, and these have combined with reductions in controls on imports for personal use leading to increases in cross-border alcohol consumption. In the case of Finland and Denmark in particular, the advent of lighter controls on alcohol imports for personal use were met with reductions in alcohol taxation with the aim of preventing greater losses in the demand for alcohol and thus protecting the national tax base.

Cross-border shopping increased significantly in these three cases following the reduction of controls on imports for personal use. The cross-border purchases not only reduce the tax revenues that can be collected by national tax authorities; there is also evidence that increased cross-border purchasing has led to an increase in consumption in the receiving countries, especially Finland and Sweden. This suggests consumers did not simply change the location of their alcohol purchases, but also increased their total alcohol consumption. However in some of the case studies consumption seems to have levelled off or even dropped somewhat once consumers adjusted to the availability of cheap alcohol in neighbouring countries, a phenomenon witnessed in Sweden and to a lesser extent in Finland.

Importantly, there is evidence of a relationship between the reduction of controls on imports for personal use and alcohol-related harms in the countries examined here. The evidence for this is robust in Finland, suggestive in Sweden, but still inconclusive in the UK.

The findings from this analysis refer to three case studies of cross-border alcohol consumption between countries sharing sea borders. It is unclear from this analysis whether these findings would be replicated in studies of cross-border consumption between other neighbouring EU countries with significant alcohol tax differentials. It is possible that countries with significant tax or price differentials sharing land borders experience even higher levels of cross-border alcohol shopping, although further research would be needed to ascertain this.

### **Alcohol pricing policies are not always used towards public health aims across the EU**

Existing research has shown that alcohol pricing policies can be effective levers to reduce alcohol-related harms. However, these policies are not always applied to public health aims across the EU. Taxation of alcohol, for example, is used primarily with fiscal rather than public health objectives across most of the EU; in fact, as our analysis shows, the real value of alcohol taxation has decreased since the mid-1990s.

Legislation setting minimum prices for alcohol, which could potentially reduce alcohol-related harms, is also uncommon in the region. This is most likely because minimum prices have tended to be seen as trade-distorting by the European courts (as setting an artificial price floor amounts to resale price maintenance, limiting and distorting price

competition), and therefore not typically considered an acceptable or feasible measure. Nevertheless, there are regulations in a small number of European countries (both EU and other European states) that act as ‘proxies’ for minimum price regulations. For example, in Germany, the so-called Apple Juice law states that in the on-premise trade, at least one alcohol-free beverage must be cheaper than the cheapest alcoholic beverage available.

The approach to restrictions on sales below cost and on sales promotions such as ‘two for one’ and ‘happy hour’, is much more diverse across the EU. While some countries (such as Belgium, Luxembourg and Poland) ban sales below cost and/or alcohol sales promotions, in others there are no regulations applying to these, or self-regulation only is in place.

### **Changes in current alcohol pricing policy could lead to reductions in alcohol-related harms – but some of them are more feasible than others**

Policy changes to reduce current levels of alcohol-related harms could be implemented at the EU or national level, such as increases in alcohol excise duties, reductions in the personal import limits or control of below cost and promotional sales. However, changes at the EU-level, such as meaningful increases in the minimum excise duty rates or revisions to the indicative levels for personal use for cross-border alcohol purchases, seem highly unlikely in view of the pre-eminence of single market priorities, and the need for consensus by all MS in EU fiscal policy. Increases in taxation at the national level could be an effective strategy to reduce alcohol-related harms, but their feasibility in the current European context is compromised by downward pressure on taxes caused by the single market, and by the strength of the opposition to tax increases.

This leaves restrictions on sales below cost and on sales promotions, which could also be effective in curbing alcohol-related harms, but are not widespread across the EU. These types of measure are unlikely to be deemed trade-restrictive, which should enable MS to implement this policy without contravening of EU law. Equally, from a legal perspective, bans on sale below cost could be part of industry self-regulatory codes of practice, although they are not yet widespread in current self-regulation initiatives. However, in most EU MS it is not known exactly how much alcohol is sold below cost, so the overall impact of this policy remains uncertain.

### **It is important to understand the influence of price and affordability on alcohol consumption and harms in order to inform effective policy-making**

Understanding the influence of individual factors such as price or affordability can provide policy-makers with a variety of tools to achieve the aims of policies to address a public health concern such as harmful and hazardous alcohol consumption. This and many other studies indicate that the price and affordability of alcohol *do* impact on levels of harmful and hazardous alcohol consumption; hence policy-makers should consider measures affecting the price of alcohol, and therefore its affordability, to help reduce alcohol related harms.

Harmful and hazardous alcohol consumption *is* a multi-factorial problem, so approaches to influence the price/affordability of alcohol are not the only elements of most countries’ alcohol strategies. Other policies have been shown to be effective in reducing harmful and hazardous alcohol consumption, such as reducing alcohol outlet density, increasing

minimum legal drinking ages, and enforcing drink-driving counter-measures. An effective alcohol strategy is a policy mix that includes evidence-based interventions in all these fields.

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In addition, many people at various events provided very useful feedback when we presented our findings. The events include: 1) a workshop organised in Brussels in the context of this study (a list of participants is provided in Appendix B); 2) a meeting of the Committee on National Alcohol Policy and Action in Luxembourg; 3) a meeting of the European Alcohol and Health Forum in Brussels; 4) a meeting for an EC co-financed project supporting the coordinated implementation of the Framework for Alcohol Policy in the World Health Organisation (WHO) European Region and the Commission Communication on an EU alcohol strategy, in Barcelona; and 5) a meeting of the EC-financed AMPHORA (Alcohol Measures for Public Health Research Alliance) project, also in Barcelona. We extend our thanks to all of them.

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Any errors remain our own.



## 1.1      **The challenge of harmful alcohol consumption**

Alcohol is an important economic commodity in Europe, creating jobs, generating fiscal revenues in the form of alcohol taxes, and contributing around €9 billion to the European Union's (EU) economy through trade (Anderson and Baumberg 2006). Alcohol has also been of great socio-cultural importance for thousands of years, drunk as an accompaniment to meals, shared in celebrations and rituals, and even used as medicine.

While alcohol has been, and continues to be, consumed in an unproblematic way by many people, a significant proportion of alcohol consumption is problematic and generates harms for individuals and societies. Harmful and hazardous use of alcohol results in serious health, social and economic harms, and is the third leading risk factor for death and disability in the EU after tobacco and high blood pressure. While total alcohol consumption has declined in the EU since 1970, harmful drinking patterns remain significant; for example, more than one in four deaths among young men are due to alcohol (DG SANCO 2006; Hoorlings *et al.* 2006). Europe has the highest proportion of drinkers and the highest levels of alcohol consumption per head of the population in the world, with total alcohol consumption averaging 11 litres of pure alcohol a year per adult.<sup>3</sup>

The high levels of alcohol consumption recorded in the EU have been linked to a number of public health and other problems, including violence and crime, diseases such as cirrhosis, lost productivity and absenteeism, family breakdown and accidental deaths.<sup>4</sup> Through these harms, alcohol misuse generates high costs to society. It was estimated that the cost in the EU of alcohol misuse was around €125 billion in 2003, equivalent to 1.3% of GDP (DG SANCO 2006). This exceeds by an order of magnitude the reported contribution (about €9 billion) of the alcohol industry to the EU economy, although it is unclear whether these figures are directly comparable.

In spite of extensive evidence that raising alcohol prices reduces consumption on a societal level, the trend in the real price of alcoholic beverages is decreasing in many countries,

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<sup>3</sup> European Commission: Health EU (available at [http://ec.europa.eu/health-eu/my\\_lifestyle/alcohol/index\\_en.htm](http://ec.europa.eu/health-eu/my_lifestyle/alcohol/index_en.htm), accessed May 2008). See also: DG SANCO 2006; Anderson and Baumberg 2007.

<sup>4</sup> Institute of Alcohol Studies Fact Sheet, 'Alcohol consumption and harm in the UK and EU' (available at: [http://www.ias.org.uk/resources/factsheets/harm\\_ukeu.pdf](http://www.ias.org.uk/resources/factsheets/harm_ukeu.pdf), accessed April 2008).

including those in Europe (WHO 2004). In addition, taxes on alcohol are relatively low in many EU countries and, with few exceptions (such as the historically higher taxation levels of Scandinavian countries and taxation of alcopops in some countries), serve primarily fiscal and not public health functions. This is reflected in the stability of alcoholic beverage taxes vis-à-vis inflation rates. The stability of alcohol taxation is partly due to the fact that public agencies may be reluctant to raise alcohol taxes because this would affect not only binge and dependent drinkers, but also moderate or light drinkers who do not generate public costs through alcohol-related harms (Chaloupka *et al.* 2002). Trade dispute decisions may have also contributed to the failure of governments to raise alcohol taxes in accordance with inflation (Babor *et al.* 2003). Other price policies aimed at increasing the price of alcohol and reducing consumption have also changed in recent years; for example, in Sweden the production, wholesale, import and export monopolies were eliminated in 1995 with the country's accession to the EU. In 2004 limits on the private import of alcohol were virtually completely removed in Sweden (Andreasson *et al.* 2006).

At the same time, however, there is debate among various sectors within the alcohol field (policy-makers, the alcohol industry, public health advocates and practitioners, and other groups) about the implications of policies designed to curb harmful and hazardous drinking for those who drink alcohol responsibly, and for the alcohol industry. Another contentious issue is the extent to which certain alcohol pricing policies, such as higher taxation, could lead to increased smuggling and illegal production of alcoholic beverages. A central question for policy-makers, then, is how to strike the balance between reducing alcohol harms and minimising the costs and negative outcomes of alcohol policies.

## 1.2 European policy responses

Against this background, there is an increasing pan-European interest in developing and implementing measures to combat alcohol harms. Individual Member States (MS) apply a wide range of policies to reduce the harmful consumption of alcohol and encourage responsible drinking patterns. These policies include the regulation of retailing and competition; drink-driving regulations, minimum age for sales, regulation of advertising and many more.<sup>5</sup>

In cooperation with the Member States and stakeholders, the European Commission (EC) is also actively involved in this agenda by carrying out a number of activities and actions in different areas, including the following:

- In 2006, the EC established an EU strategy to support Member States in reducing alcohol-related harm, which highlights good practice in alcohol policy and identifies areas where the Community could make future progress (European Commission 2006);
- The EC's *Television Without Frontiers* (now *Audiovisual Media Services*) Directive helps to set minimum standards for alcohol advertising that aim to contribute to reducing consumption and harms, by specifying that '[a]lcohol advertisements

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<sup>5</sup> For an overview see, for example, Babor *et al.* (2003).



shall – among other things – not be aimed specifically at minors, shall not link the consumption of alcohol to enhanced physical performance, social or sexual success and shall not claim that it is a stimulant, a sedative or a means of resolving personal conflicts’.<sup>6</sup>

- In 2001 the EC issued a recommendation for more uniform maximum blood alcohol limits (BAC) for drivers across the EU (European Commission 2001). The recommendation states that all MS should adopt a BAC limit of 0.5 mg/ml or lower for drivers of all motorised vehicles, and lower (0.2 mg/ml) for higher-risk drivers, including inexperienced drivers, those driving two-wheeled motor vehicles and others.

In recognition of the extensive evidence indicating that price is a key determinant of alcohol consumption and that price can be a powerful policy lever to reduce alcohol-related harms, the European Commission asked RAND Europe to conduct a study on the affordability of alcohol products across the EU, and the potential impacts of affordability on harmful use of alcohol.

### 1.3 Objectives of this study

The study is intended to show whether alcohol affordability could be an effective policy lever for public authorities seeking to reduce harmful alcohol consumption in Europe. It does this by reviewing available evidence and presenting econometric analysis of the links between alcohol affordability, consumption and harms. More specifically, the study aims to:

- Examine the link between the affordability of alcoholic beverages, alcohol consumption and alcohol-related harms;
- Study the impact of cross-border tax-driven or competition-driven price differentials, which are an important policy concern for the EU;
- Examine the policy levers that can influence the affordability of alcohol, by providing an overview of the current EU legal framework and context conditioning the behaviour of both economic operators and national governments (e.g. alcohol excise duties, current EU policy on indicative levels for personal use in cross-border alcohol purchases, competition law and so forth).

It is not within the scope of this study to conduct a cost-benefit analysis that would suggest an optimal level of alcohol consumption across the EU. As a result this study cannot answer policy questions regarding, for example, the optimal level of alcohol taxation or whether alcohol sales below cost should be banned. Rather, this study takes as its point of departure that the current levels of alcohol-related harms are considered unacceptably high by the European policy community. Starting from this point, we collate existing evidence

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<sup>6</sup> European Commission: Audiovisual and Media Policies (available at [http://ec.europa.eu/avpolicy/reg/tvwf/advertising/index\\_en.htm](http://ec.europa.eu/avpolicy/reg/tvwf/advertising/index_en.htm), accessed May 2008).

and statistical data from the EU to examine whether pricing policy could be effective in reducing these harms in the region.

This report presents the findings addressing the research questions for this study in the remaining chapters.

## 1.4 Research approach

Four main activities were undertaken in the course of this research: a review of existing literature and research relevant to the study; secondary analysis of quantitative data on alcohol taxation, affordability, consumption and harms; a survey of economic operators in the alcohol industry, researchers, government bodies, public health advocates and others; and a workshop with representatives from those sectors. This section describes each of this in turn.

### 1.4.1 Review of existing literature

In order to place this study and our own data analysis in context, we conducted a review of literature, focusing primarily on existing research on the links between alcohol price and income, consumption and harms. Research specifically on alcohol *affordability* is extremely limited, which is why the review of literature for this study focused on alcohol price and income, the two indicators that affordability encompasses. Because of time and resource constraints, the review of existing research drew primarily on meta-analysis and systematic reviews rather than on individual studies.<sup>7</sup> Nevertheless, individual studies were reviewed when they offered insights unavailable in existing systematic reviews and meta-analysis. The study's examination of alcohol pricing policy levers (particularly taxation), and its case studies on cross-border alcohol consumption also drew on existing literature.

While much of the existing research on alcohol price, consumption and harms originates in the United States, Canada and Australia, Europe also has an important tradition of alcohol research. Much of this is from the Nordic countries and the UK. Although the literature review drew primarily on research from these areas, literature from other European countries was used wherever possible.

A number of sources were used to identify relevant literature. First, searches for the main relevant literature (journal-based or independent) were conducted through databases (including PubMed, Web of Science, and Wilson Select Plus) and peer-review, academic journals (such as *Addiction*; *Substance Use and Misuse*; *Journal of Substance Use*; *Alcohol Research and Health*; *Journal of Studies on Alcohol*; and others). Grey literature (i.e. reports and studies produced by professional associations, government, international organisations and other relevant bodies) was also consulted where relevant.

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<sup>7</sup> Meta-analyses and systematic reviews give a reflection of the balance of evidence in a particular area of research. Meta-analyses typically use quantitative methods to combine the results of studies that address similar research questions, with the aim of overcoming the limited statistical power of individual studies with small sample sizes. Systematic reviews consist of thorough literature reviews aimed to identify all high quality research evidence on a particular research question by applying robust quality criteria for selection. Systematic reviews then summarise the findings from the high-quality research identified, thus providing an overview of the strongest evidence available on the given research question.

#### 1.4.2 **Secondary analysis of quantitative data on alcohol taxation, affordability, consumption and harms**

The research also included quantitative analysis of secondary data on: alcohol taxation, alcohol affordability, alcohol consumption, and alcohol-related harms. Details of this analysis are provided in the relevant chapters (Chapter 2 for taxation, Chapter 3 for affordability, Chapter 4 for consumption and Chapter 5 for alcohol-related harms).

#### 1.4.3 **Survey**

As part of this project, the research team conducted a survey (designed in cooperation with the EC) to gather data from across the EU on:

- the price of alcoholic beverages;
- trends in consumption of alcoholic beverages in the on- and off-trade;
- trends in alcohol sales promotions in the on- and off-trade;
- existing pricing legislation or non-statutory pricing measures (including measures to curb sales promotions and sales below cost).

This on-line survey was sent to members of the European Alcohol and Health Forum, and members of the Committee on National Alcohol Policy and Action (a total of nearly 90 representatives of MS public administrations, industry, research organisations and other stakeholders in the alcohol field in Europe). The survey received 293 visitors. Forty-one people responded to at least one question. Most of the survey questions received between ten and twenty responses. The information gathered through this exercise was used primarily in Chapters 2 and 6 (on the price of alcohol and on pricing policy and legislation respectively).

#### 1.4.4 **Workshop**

In response to the EC's brief for this research, RAND Europe organised a workshop with a limited number of participants in which the findings from the research so far were presented, and where possible recommendations and tools for action were discussed and developed. The workshop aimed not only to enable these recommendations to be derived not only from our own analysis but also to draw on the experience and expertise of the workshop participants. We drew on insights from this workshop primarily in the development of Chapter 8. Participants were chosen and invited by the EC. A list of the workshop participants is provided in Appendix B.

### 1.5 **Structure of the report**

This report is structured as follows. In Chapter 2, drivers of the price of alcoholic beverages are identified, focusing in particular on taxation and alcohol retail practices as key determinants of the price of alcoholic beverages. This chapter also provides an overview of tax rates for alcoholic beverages across the EU. Chapter 3 explores the concept of affordability of alcohol, relating alcohol prices to the (disposable) income of individuals, and examines the affordability of alcohol across the EU. Chapter 4 examines the relationship between alcohol affordability and alcohol consumption, and Chapter 5

continues this analysis by focusing on the link between alcohol consumption and harms. The direct link between alcohol price and income on the one hand, and alcohol-related harms on the other is also discussed in this chapter. In Chapter 6 we outline the findings from three case studies on cross-border alcohol consumption: Germany-Sweden, Finland-Estonia, and UK-France. Chapter 7 examines European and selected national legislation on alcohol pricing, to determine avenues for intervention. Chapter 8 discusses the lessons and possible tools for action that can be drawn on the basis of the analysis presented in the previous chapters. This chapter also identifies some key areas for future research. Final remarks are presented in Chapter 9.

In this chapter we discuss alcohol prices, the role of taxation as a policy instrument to influence alcohol prices and consumption, and provide evidence on how excise duties vary between EU MS. The chapter also briefly discusses the impact of on- and off-trade sales on alcohol prices in the EU.

## 2.1      **Determinants of the price of alcohol**

As with many other commodities, the retail price of alcoholic beverages is determined by several factors. The most important factors are:

1. production costs, these include the costs of the inputs (e.g. grain and hops), and the costs of processing those inputs, as well as wider marketing costs (e.g. for establishing and maintaining brands);
2. the costs of transporting, distributing, and retailing;
3. the demand and supply for alcoholic beverages;
4. the level of competition (e.g. between different retailers, and between alcohol producers);
5. the quantity purchased (e.g. bulk discounts, such as a keg/case of beer, pitcher of margaritas, case of wine)
6. the level of taxation (e.g. value added tax and specific alcohol taxes);
7. the type of retailing (on- and off-trade);

In view of their importance for alcohol policy, this study focuses primarily on the last two factors: taxation and type of retailing. While also of great interest, it is not within the scope of this study to examine other factors affecting alcohol prices, such as competition or quantities, which are other potential policy levers.

Insofar as it can affect the price of alcohol, taxation is of particular interest as a possible policy lever to influence the price of alcoholic beverages, and thus reduce hazardous and harmful consumption. Studies from many countries in Europe and elsewhere have shown an inverse relationship between alcohol prices and consumption - that is, that when all other factors remain unchanged, increases in the price of alcohol (e.g. following the imposition of high taxation) generally lead to a decrease in alcohol consumption and related harms (this is discussed in more detail in Chapters 4 and 5). Conversely, these studies have also shown that decreases in price (such as when taxation is reduced, or through large scale use of sales promotions in retail outlets) commonly lead to increases in alcohol consumption and harms. This is examined in greater detail in Chapter 4 of this report.

As a result, interest in policy measures aimed at increasing the price of alcohol as part of wider public health strategies is growing across the EU. Price increases can be produced by other government policies (e.g. restrictions on bulk discounts or on happy hour pricing, licensing fees and so on). However, the use of alcohol taxation as part of wider public health strategies, in particular, has been the subject of intense academic and policy debate for many years in Europe and elsewhere. It has traditionally been used in some EU MS, most notably Finland and Sweden, as a tool to increase the price of alcohol and reduce its consumption and attendant harms. Equally, there is growing policy interest across the EU in the ways in which off- and on-trade alcohol retailing affect alcohol prices. More and more, EU MS are recognising that a potentially effective pricing policy to curb harmful and hazardous alcohol consumption could involve measures to affect alcohol prices in the on- and off-trade.<sup>8</sup>

This chapter discusses the role of taxation as an alcohol policy tool, providing an overview of alcohol taxation across the EU, and then examines evidence of the influence of on- and off-trade alcohol retail on alcohol prices.

## 2.2 Taxation as a policy instrument

Taxation (excise duties) is a policy instrument that has been used by some governments over time to influence the price of alcohol with the aim of reducing consumption and its attendant harms (although taxation of alcohol is used in most countries primarily with fiscal rather than public health aims). Alcohol taxation can not only be used to increase the price of alcohol; it has the added benefit of increasing fiscal revenue for government (Sheron *et al.* 2008). High levels of taxation, however, can also make alcohol more expensive for moderate drinkers whose consumption is not problematic and reduces the profits of the alcohol industry. These increased expenses and reduced profits are possibly the main reasons why the most appropriate levels of alcohol excise duties are subject to intense debate and controversy, especially between public health advocates, policy-makers, industry representatives and other stakeholders.

Individual countries, and sometimes provincial or state governments within them, set their own alcohol taxation policies with specific aims. Some countries, most notably Nordic countries such as Finland and Sweden, have traditionally taxed alcohol at higher levels than other European countries, primarily with a view to curbing alcohol consumption and harms. Wine-producing countries like France, Italy and Spain on the other hand, have tended to levy very low or no excise duty rates on wine, with the aim of supporting the wine industry and maintaining high levels of sales.

There are also EU level alcohol pricing and taxation policies. Alcohol excise duty rates have not been fully harmonised in the EU, but a series of minimum rates was established. MS retain sovereignty to set excise duty rates above these minimum rates at levels they consider appropriate according to their own national circumstances (more details of this are provided in Chapter 3).

In fact, over the last ten years significant tax differentials between neighbouring countries have led the higher-taxation states to cut their rates; for example Germany's lower taxes led Denmark and then Sweden to lower their own, and more recently duty reductions in Finland followed the accession of Estonia to the EU (Anderson and Baumberg 2006). In Europe, as in many countries worldwide, alcohol pricing and taxation continue to be used primarily as fiscal rather than public

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<sup>8</sup> On-trade refers to pubs, clubs, restaurants and other retailers selling alcohol for consumption within the venue. Off-trade refers to supermarkets and off-licences, selling alcohol for consumption elsewhere. These are also referred to as on-premise and off-premise sales of alcohol.

health instruments, with alcohol being considered primarily an economic commodity. Notable exceptions to this are the Nordic countries (particularly Sweden and Finland), where a long history of highly restrictive systems of alcohol production and sales were established, and alcohol taxation has traditionally been higher than in most other European countries.

In spite of the extensive literature on alcohol taxation as a public health policy instrument to curb harmful and hazardous drinking, there is a limited understanding of the exact effect of alcohol tax increases on alcohol prices, which is ‘a key link in the chain of causality from the tax to public health’ (Kenkel 2005, p. 273). While the economic and public health literature raise questions about the extent to which tax increases are passed on to consumers, this literature does not provide many answers, and the empirical evidence for this is very limited (*ibid*). Existing research has shown, however, that the price of some alcoholic beverages increases by more than the tax increase, a phenomenon referred to as ‘over-shifting’ (Young and Bielinska-Kwapisz 2002). One study from the US found that over-shifting takes place in both on- and off-trade retailing of alcohol (Kenkel 2005).

In the EU there is ongoing debate as to the extent to which tax increases are or would be passed on to consumers. It is possible that, while on-trade retailers pass on any tax increases to consumers, the off-trade, particularly large retailers such as supermarket chains, may be more able to absorb some or all of the change in taxation thus leading to small or no increases in the price of alcohol. However, the way in which changes in alcohol taxation lead to changes in price in the EU has not yet been sufficiently researched and deserves careful attention.

## 2.3 Current levels of taxation across the EU

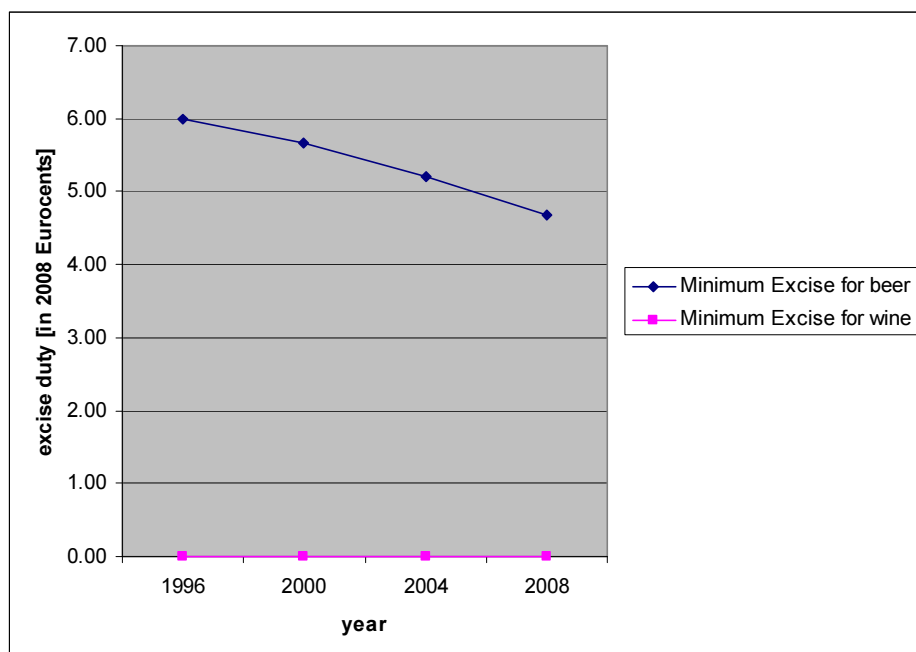
Excise duty rates on alcoholic beverages are not harmonised across the EU. However, Council Directive 92/83/EEC instructs MS on how to define the products and product categories to be taxed, and sets out the principles of how to set the excise duty rates for these products. Council Directive 92/84 EEC sets a minimum excise duty rate for distilled spirits, beer and intermediate products (such as fortified wines and liqueur wines), although no minimums are set for wine and fermented beverages other than wine and beer (more on the origins of this Directive in Chapter 3) (Cnossen 2006). While these minimum rates are binding, MS can set their own excise duty rates anywhere above this minimum.

Directive 92/84/EEC specifies that the minimum excise duty rate for distilled spirits is €550 per hectolitre of pure alcohol in the finished products or €1.54 per 70cl bottle of 40% ABV (alcohol by volume); furthermore countries with excise duty rates below €1000 per hectolitre cannot reduce them further, and those above €1000 cannot go below €1000/hectolitre or 2.8€ per 70cl bottle of 40% ABV. The minimum excise duty rate applied to all beers with an alcohol content of 0.5% by volume or over, is €1.87 per hectolitre per degree of alcohol of the finished product, €0.748 per hectolitre per degree Plato of the finished product. Intermediate products have a minimum rate of €45 per hectolitre. The minimum excise duty rate for sparkling and still wines and for fermented beverages other than wine and beer is set at €0.<sup>9</sup> Some exceptions and reductions in the excise duty rates can be applied to small breweries and distilleries (Österberg and Karlsson 2003).

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<sup>9</sup> In this study we limit our analysis to spirits, wine and beer, but do not include intermediate products. This is because spirits, wine and beer constitute most of the alcohol consumed across the EU, and because they are the types of beverage on which most existing research and analysis focuses.

As shown below in Figure 2-1 and Figure 2-2, the minimum rates set by Directive 92/84/EEC have not been adjusted since 1992, which entails a reduction in their real value<sup>10</sup> of around 25%. We use two different figures for wine and beer on the one hand and spirits on the other, because of the difference in scale; that is the much higher tax on spirits than on beer (and wine).



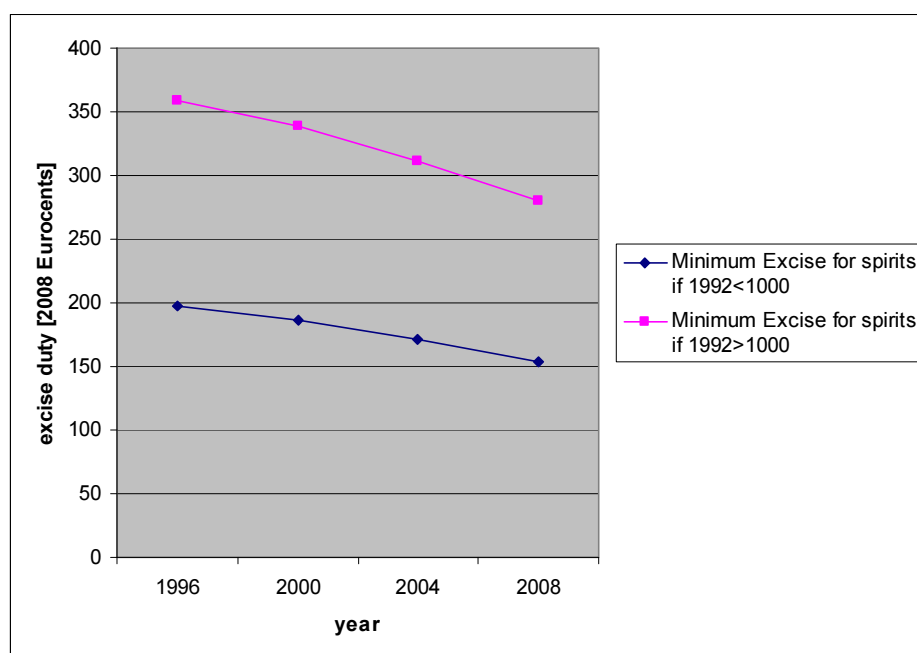
Source: European Commission Directorate General Taxation and Customs Union, Eurostat, author calculations

**Figure 2-1: Change in real value of minimum excise duty on beer and wine, 1996-2008**

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<sup>10</sup> Real values have been calculated throughout this report by adjusting for inflation (using the Harmonised Index of Consumer Prices (HICP)).



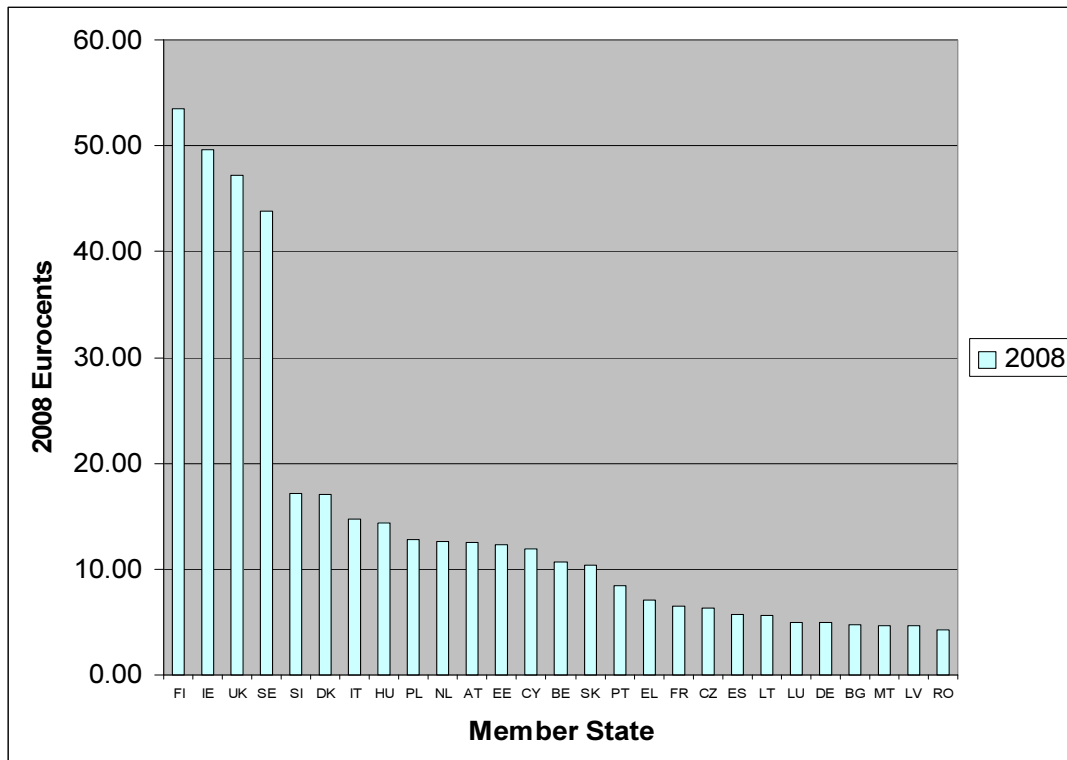


Source: European Commission Directorate General Taxation and Customs Union, Eurostat, author calculations

**Figure 2-2: Change in the real value of excise duty on spirits, 1996-2008**

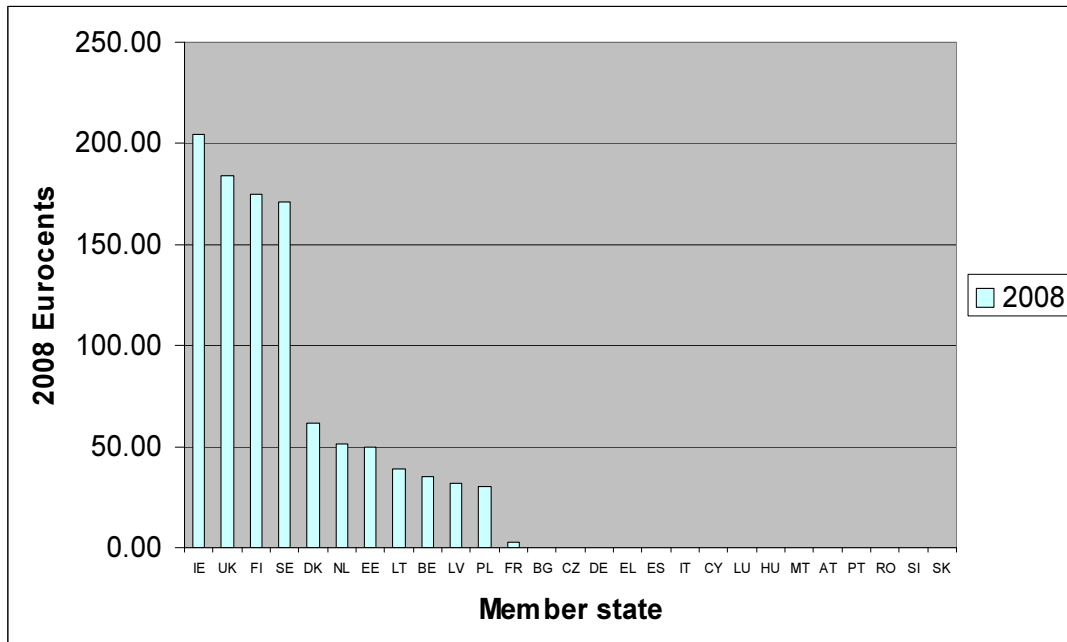
As mentioned above, each MS sets its own excise duty rates for alcoholic beverages, in accordance with the guidelines provided in Directive 92/84/ECC. The figures below present 2008 excise duty rates for still wine (in Eurocents), beer (in Eurocents) and spirits (in Euros) for all twenty-seven EU Member States.<sup>11</sup>

<sup>11</sup> Numbers in 2008 Euros/Eurocents have been calculated throughout this report by adjusting for inflation (using the Harmonised Index of Consumer Prices (HICP) and converting into Euros/Eurocents (using exchange rates). The conversion into Euros/Eurocents can also be done by means of purchasing power parity (PPP) figures. A correlation exercise between exchange rates and PPP figures showed no significant differences between the two.



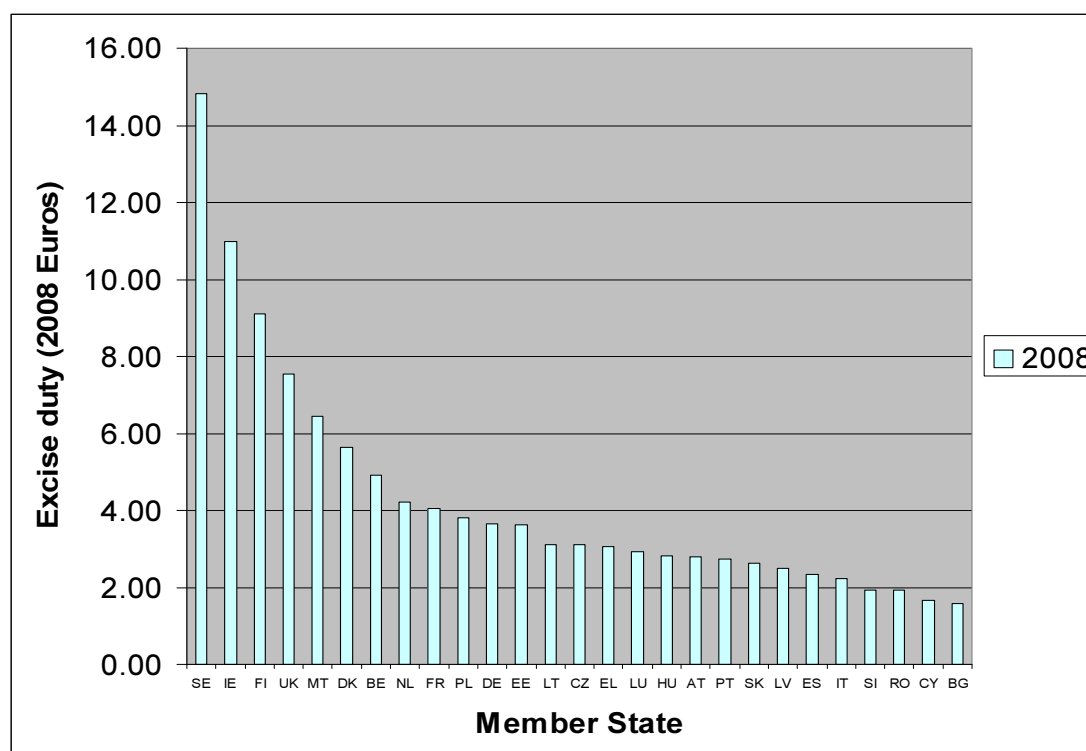
Source: European Commission Directorate General Taxation and Customs Union, Eurostat, author calculations

**Figure 2-3: Excise duty on a pint of beer in 2008, EU 27**



Source: European Commission Directorate General Taxation and Customs Union, Eurostat, author calculations

**Figure 2-4: Excise duty on a bottle of still wine in 2008, EU 27**



Source: European Commission Directorate General Taxation and Customs Union, Eurostat, author calculations

**Figure 2-5: Excise duty on a 70cl bottle of 40% ABV spirit**

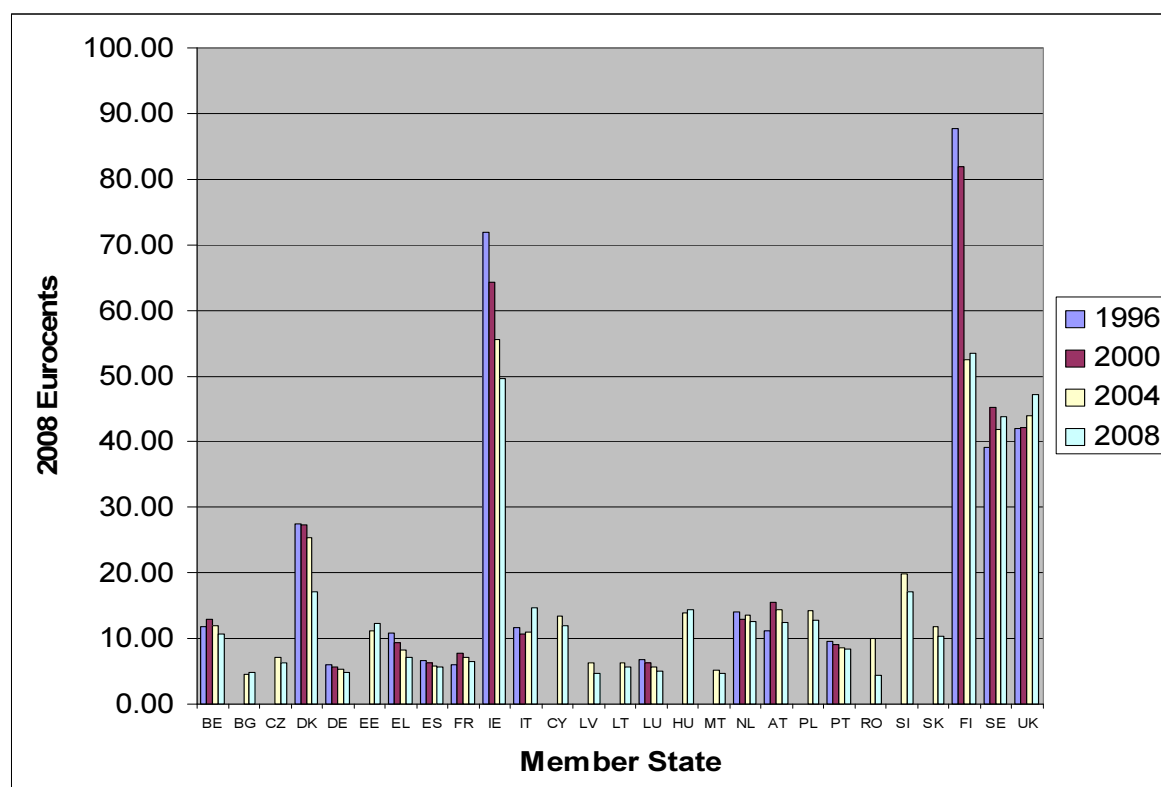
As the figures show, the minimum excise duty rates imposed by this Directive have not led to convergence in the excise duty rates set by MS. Instead, a high degree of variability is found in the excise duty rates on alcoholic beverages in individual MS. While differences are pronounced for all three types of alcoholic beverage, it is particularly notable in the case of still wine, where some countries set an excise duty of over €1,50 for a bottle, whereas a significant number of others do not impose an excise duty on wine at all.

It is also noteworthy that there is a small group of countries that set significantly higher excise duty rates on alcoholic beverages than others. This group includes Ireland, Sweden, Finland and the UK. In addition, it appears that wine-producing countries such as France, Spain, Italy, Germany and Austria are less prone to setting excise duties on wine. Except for these observations, there is no readily discernable pattern in the way each individual country sets excise duty rates for beer, still wine and spirits.

It is important to note that looking at taxation of alcohol in absolute terms at a particular point in time fails to take into account differences in price of alcohol and/or income in different MS. An excise duty of 47 Eurocents on a pint of beer, for example, is likely to mean something different to a consumer in the UK, where a pint of beer costs around £2.20, to one in Estonia, where the price of a pint of beer is roughly £1.10. We discuss this point in greater detail in Chapter 4.

There is also variability in the evolution of excise duty rates over time; while in some countries they have remained relatively stable over the last decade, significant changes occurred in others. The figures below present excise duty rates in real terms – that is, taking into account changes in inflation, in the EU for four years (1996, 2000, 2004 and 2008), for beer, still wine and distilled

spirits (excise duty tables for all alcoholic beverages for the EU-27 for the four years are provided in Appendix A).<sup>12</sup>



Source: European Commission Directorate General Taxation and Customs Union, Eurostat, author calculations

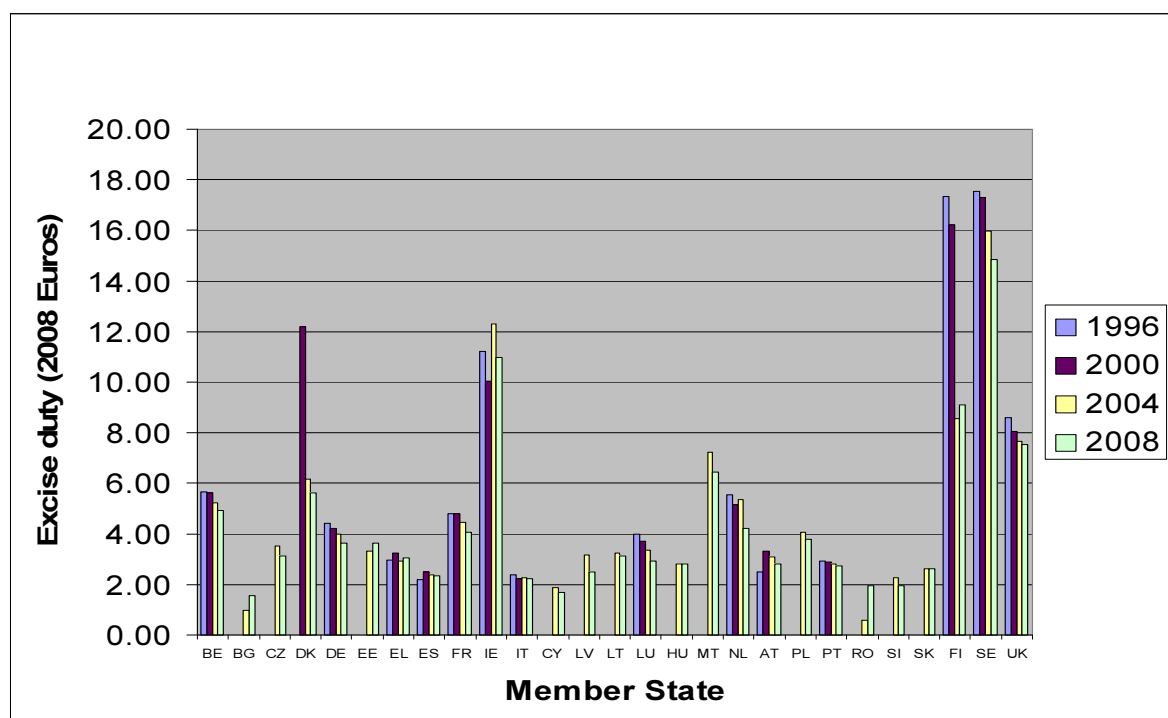
**Figure 2-6: Excise duty on a pint of beer in 1996, 2000, 2004 and 2008, EU 27**

<sup>12</sup> Excise duty rates in new accession countries are quoted for only 2004 and 2008.



Source: European Commission Directorate General Taxation and Customs Union, Eurostat, author calculations

**Figure 2-7: Excise duty on a bottle of still wine in 1996, 2000, 2004 and 2008, EU 27**



Source: European Commission Directorate General Taxation and Customs Union, Eurostat, author calculations

**Figure 2-8: Excise duty on a 70cl bottle of 40% ABV spirit**

The figures above suggest two interesting findings. First, the real value of excise duty rates for most alcoholic beverages has gone down since 1996 in the vast majority of EU MS. Exceptions include, for example, the UK and Italy, which have seen an increase in the real value of excise duty rates for beer, and for wine also in the UK.

A second finding flowing from the figures above is that while there is a general decline in the real value of excise duty across the different types of alcohol, this decline is not large in most countries. Nonetheless, there is a steep reduction in the real value of excise duty rates in a few countries, for example in Ireland's taxation of beer and wine, in Finland's taxation of beer and spirits, in Denmark's taxation of spirits, and in Sweden's taxation of wine. Research has indicated that some of these countries which were traditionally high-taxation countries (most notably Finland and Sweden), experienced significant downward pressure on their excise duty rates on alcoholic beverages following the expansion of the single market and accession of low-taxation new MS (more on this in Chapter 6). The single European market has been shown to cause tax competition between countries as governments attempt to prevent losses of tax revenue and trade from increased cross-border shopping in countries with lower taxation (and therefore lower prices).<sup>13</sup> The graphs above, for example, show the sharp decline in the excise duty for beers and spirits (and less sharp decline for wine) in Finland in 2004, the year that neighbouring Estonia (a low-taxation country) joined the EU.

### 2.3.1 The real value of alcohol taxation in Europe

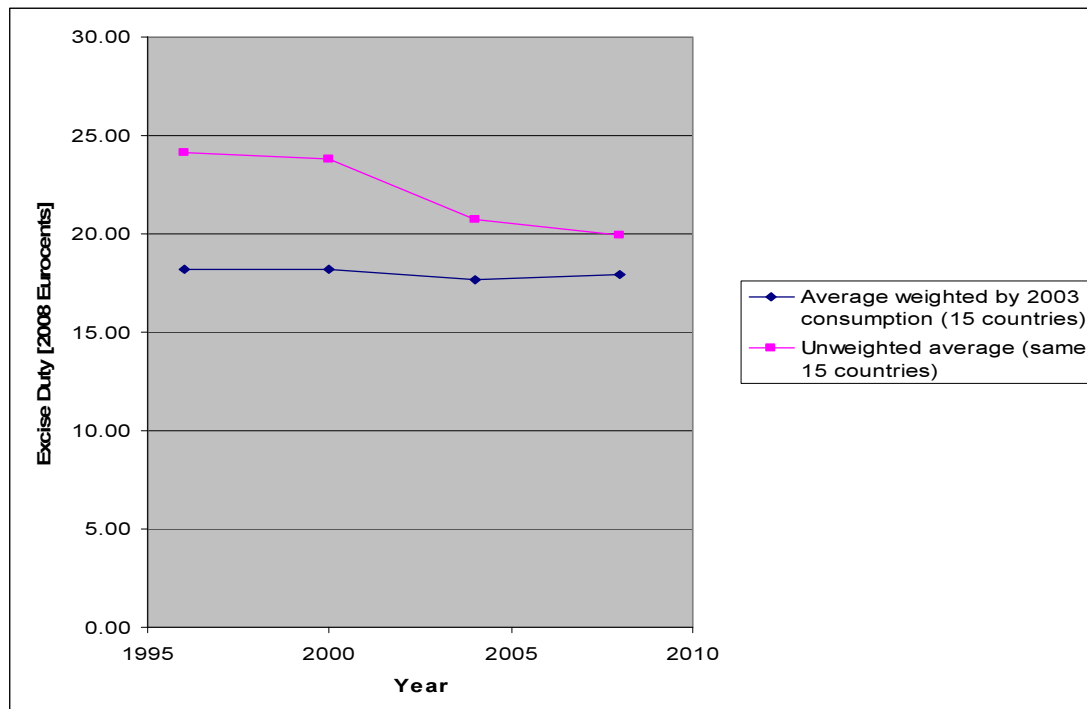
The decline in the real value of alcohol taxation across the EU as a whole is illustrated in the figures below. These figures show the variation over time of: 1) the unweighted average excise duty (giving equal weight to all countries) and 2) the average weighted according to total (2002) consumption, thus giving higher weight to countries with higher total consumption.

There exists an important difference between the two averages. Whereas the unweighted average shows the average excise duty on the same pint of beer, bottle of wine and bottle of spirit across different MS over time, the weighted average shows the level of excise duty being paid (on all pints of beer, bottles of wine and bottles of spirit) in Europe. Since more beer, wine and spirit are consumed in some countries than in others, the two do not coincide.

We only have comparable tax data prior to 2004 for the EU-15 countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the UK. These countries encompass 79% of the EU-27 population. We expect our weighted average is likely to be somewhat biased towards the larger countries (with a strong 'drinking culture') included in the sample. This is shown in three different figures for wine, beer and spirits, because of the difference in scale – that is, the much higher tax on spirits than on beer (and wine).

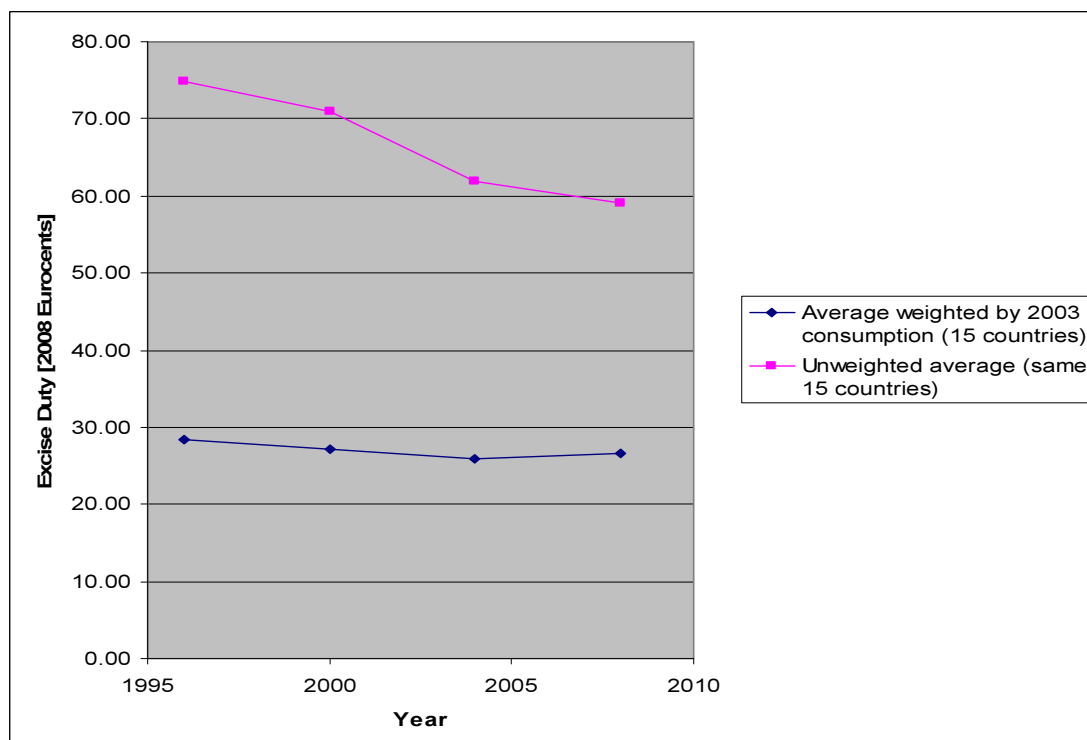
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<sup>13</sup> See for example: Lockwood, B. *et al.* (2008), also: Anderson and Baumberg (2006).



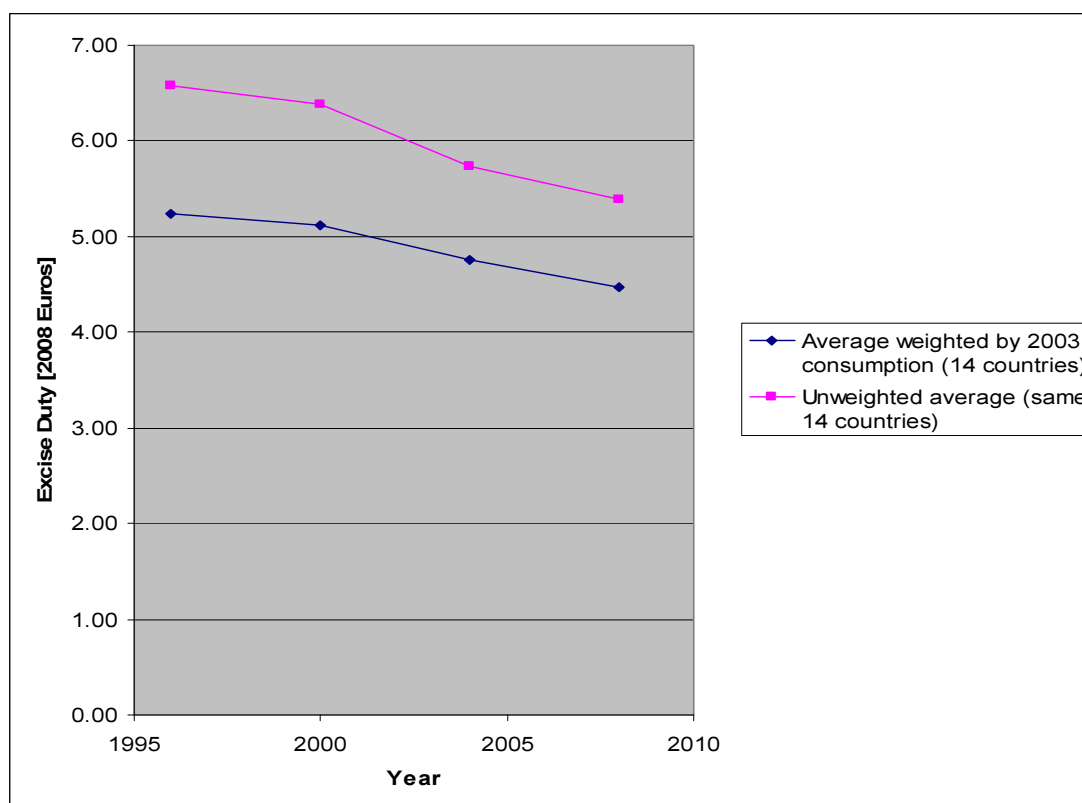
Source: European Commission Directorate General Taxation and Customs Union, Eurostat, World Health Organization Global Information System on Alcohol and Health, author calculations

**Figure 2-9: Change in real value of average excise duty of beer across the EU, 1996-2008**



Source: European Commission Directorate General Taxation and Customs Union, Eurostat, World Health Organization Global Information System on Alcohol and Health, author calculations

**Figure 2-10: Change in the real value of average excise duty of wine across the EU, 1996-2008**



Source: European Commission Directorate General Taxation and Customs Union, Eurostat, World Health Organization Global Information System on Alcohol and Health, author calculations

**Figure 2-11: Change in the real value of average excise duty of spirits across the EU, 1996-2008**

The unweighted averages in the figures above illustrate the general decline, on average, of the real value of excise duty on alcohol within MS.

## 2.4 On- and off-trade sales of alcohol

As discussed in Chapter 4 and 5 in this report, over the last few decades a significant body of research has been developed that considers the link between alcohol prices, consumption and harms. Some of this research examines the determinants of alcohol price, most notably the effect of taxation. Less is known, however, about the impact of type of retailing on alcohol prices, although policy interest in the differences between off- and on-trade alcohol retail practices is growing partly as a result of a perceived increase in the amount of alcohol purchased off-trade.

### 2.4.1 On- and off-trade alcohol sales and prices

A survey of alcohol industry, MS public authorities and public health researchers and advocates conducted as part of this study provides information on the extent to which there is a trend in a number of countries across the EU towards more off-trade alcohol consumption, which tends to be cheaper than alcohol sold for on-premise consumption. In countries such as the UK, Sweden, Finland, Latvia, Ireland and The Netherlands, respondents reported that off-premise alcohol sales are growing relative to on-premise sales (this is also observed for Norway, which is not an EU member). This is true even in those countries in which the market share of the on-trade has traditionally been larger, such as Ireland and The Netherlands. In Ireland, for example, the off-



premise share of the alcohol market in monetary terms has grown from 19.1% in 1991 to 27.5% in 2000 and 35.6% in 2006 (although, according to other estimates provided in the survey, the increase in the share of off-premise alcohol sales has been larger, from around 30% to 50% in the last five years). In the UK sales from supermarkets and off-licences now account for nearly 50% of all alcohol consumption (SHAAP 2007).

Although there is little research examining this particular question, it is possible that one of the main reasons for the increase in off-trade alcohol consumption is the lower prices of alcohol in the off-trade retailing. In Norway, for example, beer, wine and spirits are three to four times more expensive when sold on-premise than off-premise. According to the survey, a similar phenomenon takes place in Finland, where alcohol sold on-premise is 3.4 times more expensive than that sold off-premise. The Netherlands, Ireland and Latvia also report large differences in alcohol prices between on- and off-premise; for Latvia, respondents reported that the prices of beer, wine, spirits and other alcoholic beverages are approximately 200% higher in on-premise than in off-premise, and for Ireland, on-premise alcohol prices appear to be more than twice the price in off-premise retailing. Moreover, in many of the countries mentioned above, respondents also reported that alcohol prices in the off-premise are decreasing relative to on-premise prices.

An important yet under-researched question is the effect of the lower alcohol prices in the off-trade on harmful and hazardous alcohol consumption. For example, there are indications in the UK that low off-trade prices not only lead to a rise in pre-loading (i.e. the practice of buying alcohol for home consumption before going out to on-trade premises) (Bennetts 2008), but also to increases in total alcohol consumption and binge drinking among youth, including those under the legal drinking age (Meier et al 2008). Further research would be necessary to shed light on this phenomenon in other EU MS.

#### 2.4.2 On- and off-trade sales promotions and discounts

There are a number of reasons why off-trade alcohol prices are considerably lower than in the on-trade. Market power is one of these reasons: off-trade retailers, especially supermarkets, can purchase large quantities of alcohol at lower prices (through volume discounts). In addition, a larger customer base for stores than for on-trade retailers enables heavier discounting in off-trade retailers (Larken 2007). In Poland, Latvia, Ireland, the UK and The Netherlands, survey respondents reported that price promotions and discounts are common both in the off- and on-trade, but some explained that this is increasingly significant in terms of value in the off-trade.

Alcohol is also often used as a 'loss leader' in the off-trade, particularly in supermarkets, across the EU. Loss leaders are products for which retailers set very low prices, often below cost, in order to lure customers into stores (Hess and Gerstner 1987).<sup>14</sup> In the UK, for example, a Competition Commission study found that large supermarkets normally engage in below cost selling of alcohol, a practice that was particularly pronounced during the 2006 World Cup, when alcohol sales were expected to be high (Competition Commission 2008). According to the report, the total value of below cost alcohol sales during the World Cup period, by only five retailers, was £38.6 million. The study also found that intense price competition and use of below-cost sales are not restricted to extraordinary events such as the World Cup; summer periods in general appear to be times of intense competition among retailers, so the use of alcohol as a loss leader intensifies as well. In general, sales below cost represent approximately 3% of all sales in the UK. There is

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<sup>14</sup> It is worth noting that there are concerns other than the way it affects alcohol consumption regarding the use of alcohol as a loss leader. For example, the use of alcohol as loss leaders in supermarkets, and other forms of off-trade sales promotions and deep discounting, have been said to be partly responsible for the decline in alcohol sales in the on-trade, with subsequent closures and loss of jobs.

also evidence from Finland that alcoholic beverages, especially beer, are used as a loss leader in supermarkets particularly during the summer months.<sup>15</sup>

#### 2.4.3 The impact of on- and off-trade sales promotions and discounts

Sales promotion and discounts include ‘2x1’ sales, ‘happy hours’, and other alcohol retail promotional practices. While the information provided here on sales promotions and discounts in on- and off-trade alcohol sales gives an indication of trends in different countries in the EU, it falls short of providing a comprehensive overview of alcohol pricing practices and their effect on long-term prices (and hence consumption and harms) in Europe.

Robust evidence of the impact of these promotions and discounts on alcohol consumption and harms is still limited. Data on the nature and extent of these phenomena is still inadequate for most EU MS. Further research is therefore required to shed light on this issue, which can provide further evidence for decision-making in alcohol pricing policy by assessing the potential effectiveness of and gains from measures to curb alcohol sales promotions and discounts.

### 2.5 Closing remarks

Using data from European Commission Directorate General Taxation and Customs Union, EUROSTAT and the World Health Organization, this chapter has shown that large variations in taxation exist across EU MS, despite the introduction of minimum excise duty rates in 1992 and the single European market. From a dynamic point of view, we show that across eleven MS, real country-weighted average excise duties for wine and beer have shown little variation between 1996 and 2008, whereas they have declined substantially for spirits. In addition, we show that at the individual MS level, some states have shown large declines in excise duty levels over the past 12 years.

The balance of research evidence (discussed in more detail in Chapters 4 and 5) indicates that the price of alcohol has a significant effect on alcohol consumption and harms. Taxation is a key lever for governments to influence alcohol prices, and has been shown to be an effective instrument for reducing alcohol consumption and alcohol-related harms (WHO 2004). However, as the analysis in this chapter indicates, the real value of alcohol taxation across the EU has decreased over the last decade, in some countries very significantly. For alcohol taxation to be an effective public health policy tool to reduce alcohol-related harms, the real price, and not just the nominal price of alcoholic beverages needs to rise at, or beyond, the level of inflation (*ibid.*). Taxation cannot effectively lead to this increase when alcohol taxes are based on “fixed excise duties that have to be adjusted by separate and politically visible decisions” rather than being set on a percentage basis, as general sales taxes are (*ibid.*).

In addition, as mentioned above, there is ongoing debate, and extremely limited evidence, about the extent to which tax increases are passed on to consumers in the form of price increases. While on-trade retailers are typically understood to pass on any tax increases to consumers as higher alcohol prices (in some cases increasing prices by more than the increase in taxation), the off-trade, particularly large retailers such as supermarket chains, may be more able to absorb some or all of the change in taxation thus leading to a small or no increase in the price of alcohol. As a result, the level at which a tax increase would be effective is not a straightforward calculation, and needs to take into account both the extent to which the tax increase would lead to price increases, but also the differential way in which this may affect on- and off-trade retailers.

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<sup>15</sup> See for example <http://www.hs.fi/english/article/1101978660661> (last accessed December 2008).

There is much less evidence on the effectiveness of policies aiming to curb alcohol sales promotions and discounts in the off- and on-trade sectors, although these are in place in a number of countries (as outlined in Chapter 7). Further research on the impact of alcohol promotions and discounts is necessary to elucidate the potential gains from these policies and assess their desirability.



## CHAPTER 3      **Affordability of alcoholic beverages in the EU**

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In this chapter we discuss alcohol affordability as a central concept in our study. We then show that for eighteen MS alcohol affordability increased between 1996 and 2004; for some countries, such as Lithuania, alcohol affordability has more than doubled over this period. We also show that for many MS this effect appears to have affected different sections of the population differently; most notably alcohol appears to have become relatively more affordable for 16-24 year olds compared to the general population.

### 3.1      **Alcohol price and affordability**

Like consumption of most other commodities, alcohol consumption is sensitive to its price. As mentioned in Chapter 1 of this report, research shows that, as with other commodities, there is an inverse relationship between price and consumption; if alcohol becomes cheaper, consumption of alcohol will go up (Anderson and Baumberg 2006).

Alcohol, however, is no ordinary commodity. Unlike most other commodities, alcohol is an addictive, psychoactive substance that can cause significant harm to the individual and wider society if consumed excessively (Bennetts 2008). Some of these harms were discussed in Chapter 1, and include diseases such as liver cirrhosis, violence and crime, and road accidents, as well as intangible harms related to loss of quality of life and alcohol-related family breakdown.

Most research on alcohol consumption and harms examines the effects of the *price* of alcohol on its consumption. A more limited body of research studies the effect of *income* changes on alcohol consumption. Research on the combined effect of income and price on alcohol consumption is, however, extremely limited. Alcohol affordability refers to people's ability to buy (consume) alcohol; it is therefore a function of price and (disposable) income.<sup>16</sup> In this chapter we briefly discuss the uses and limitations of the concept of alcohol affordability, and examine the affordability of alcoholic beverages across the EU and changes in this over time.

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<sup>16</sup> It is worth noting, however, that by combining measures of income and price, affordability as a measure obscures the differential impact of income and price changes on behaviour (in this case on alcohol consumption).

### 3.1.1 Usefulness and limitation of the affordability measure

The affordability index captures how ‘affordable’ the consumption of alcoholic beverages is for an average citizen. As we have described earlier, the affordability index is defined as the ratio of a real disposable income index to an index presenting the relative price of alcohol. It is important to understand that in this way the affordability index summarises a variety of economic indicators (as explained in the next paragraph in further detail). Hence an increase or decline in the affordability index might be due to a variety of causes.

To provide further insight into how the affordability index summarizes a variety of economic indicators, we should note that real disposable income can alter due to changes in total household income, income tax and other taxes, social contributions, other transfers, and inflation/deflation. Similarly, the relative price of alcohol can alter due to changes in the price of alcohol and/or changes in the price of other goods. The usefulness of the affordability index is that it summarises all these different indicators into one convenient measure, which can then be used to make comparisons over time or, with certain limitations, between geographical regions or socio-economic groups.

While it is a useful indicator, the affordability index also has important limitations. One of these limitations is that the index does not link *directly* to human behaviour – that is, it does not take into account that a consumer’s demand for alcohol might react to a change in their income in a different way than it will to a change in the price of alcohol, or a change in the price of other goods. To overcome this limitation, one would have to distinguish between the separate effects (*ceteris paribus*) on the consumption of alcohol of:

- price of alcohol;
- price of other goods;
- income.

Another limitation of the affordability index is that affordability does not link directly to a policy instrument. Whereas policy-makers might be able to affect the demand for alcohol by changing taxes or other regulations that directly affect the price of alcohol, policy-makers cannot decide to change affordability by, for example, 5%. Of course, they can aim to change affordability *indirectly* by changing taxes or imposing price regulation, but in that case it would be of greater interest to examine the relationship between taxation, price regulation and alcohol consumption *directly*, rather than to impose the concept of affordability as an intermediary step.

In spite of these limitations, the affordability index is useful as a summary indicator, allowing for signalling of particular trends over time, or for (relatively crude) comparisons between countries. Moreover, from a policy standpoint, it is often interesting to know the ‘net’ effect – and not just the ‘marginal’ effect – of a change in price. Examining how consumption changes with a change in affordability, as well as price, can provide this additional insight. Nevertheless, it is often useful to examine trends in the relative price of alcohol and income as well as in affordability, in order to understand better which of these two factors is driving the trend in the affordability index.

### 3.1.2 The affordability of alcohol in the EU

We use the formal definition of the affordability index used by the UK National Health Service (NHS), to estimate alcohol affordability across the EU:<sup>17, 18</sup>

$$\text{affordability\_index} = \frac{\text{real\_disposable\_income\_index}}{\text{relative\_alcohol\_price\_index}} * 100$$

The real disposable income index is a (relative) measure of disposable income, that is, total household income, minus payments of income tax and other taxes, social contributions and other current transfers, converted to real terms. The relative alcohol price index is a measure of alcohol price vis-à-vis the price of all other goods.<sup>19</sup>

Both of these measures are *relative* measures. Real disposable income and relative alcohol prices are indexed to 100 for 1996 for all EU countries. A value of 101 (for either of the two) in the year 2000 in a particular country means that real values have increased in that country by 1% relative to their value in 1996. These measures, however, do not tell us anything about *absolute* real disposable income or relative prices of alcohol between countries.

The resulting affordability index too is a *relative* measure. The index is 100 in 1996. A value of 101 for one country in the year 2000 thus means that affordability has increased in that country by 1% *relative* to its value in 1996. Again, it does not tell us anything about the *absolute* affordability of alcohol in that country (e.g. how much beer one can buy), or how the affordability of alcohol in one country compares to that in other countries.

The measure used here captures affordability by comparing the relative changes in the price of alcohol with changes in households' disposable income<sup>20</sup> over the same period. Affordability increases or decreases as a result of two processes: 1) changes in the price of alcohol relative to all other goods, and 2) changes in (real) disposable income.

To illustrate, in The Netherlands affordability has increased over the last decade. Our data indicate that up to 2002 this increase was driven mainly by an increase in (real) disposable income, and not so much by a change in the relative price of alcohol. People's disposable

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<sup>17</sup> Please see: Statistics on Alcohol: England, 2008; The NHS Information Centre. Downloadable from: <http://www.ic.nhs.uk/pubs/alcohol08> (last accessed September 2008).

<sup>18</sup> The relative alcohol price index is from Eurostat ([www.ec.europa.eu/eurostat](http://www.ec.europa.eu/eurostat)). The real disposable income index is calculated on the basis of Eurostat income data – using 1996 as a base year.

<sup>19</sup> The relative price index is based on off-trade data. The extent to which this influences our analysis is discussed in a later chapter (p.37).

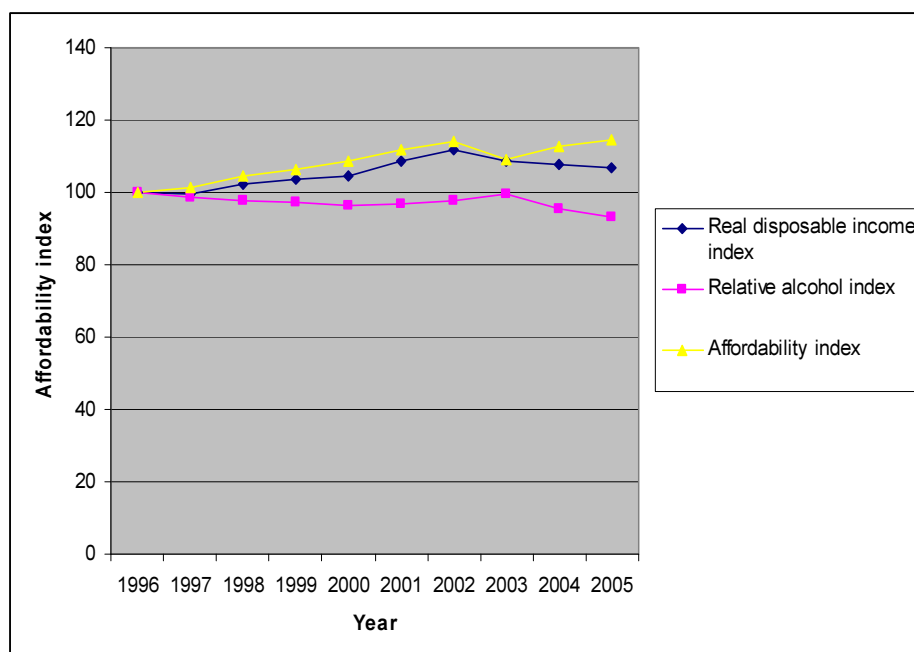
<sup>20</sup> Real disposable income is defined as: total household income, minus payments of income tax and other taxes, social contributions and other current transfers, converted to real terms (i.e. after dividing by a general price index to remove the effect of inflation). We also considered using *discretionary* income, but no appropriate data were available. Nevertheless, we would not expect to find significant differences in our estimation results using discretionary income, since we are looking at 'changes' over a relatively short time period.

income increased significantly between 1996 and 2002, allowing them to buy (and consume) more alcohol, while the relative price of alcohol remained constant.

Between 2002 and 2005, on the other hand, the increase in the affordability of alcoholic beverages was driven mainly by changes in the relative price of alcohol. While people's disposable income between 2002 and 2005, did *not* increase significantly, people in 2005 could afford to buy (and consume) more alcohol than they could in 2002 because the relative price of alcohol had fallen in that period.

This is illustrated in the figure below. It shows 1) a fairly constant relative price of alcohol between 1996 and 2002, 2) an increase in real disposable income during that period, and 3) a corresponding increase in affordability.

It also shows: 4) a fall in the relative price of alcohol between 2002 and 2005, 5) a relatively constant real disposable income for that period, and 6) a corresponding increase in affordability (also) between 2002 and 2005.



Source: Eurostat, author calculations

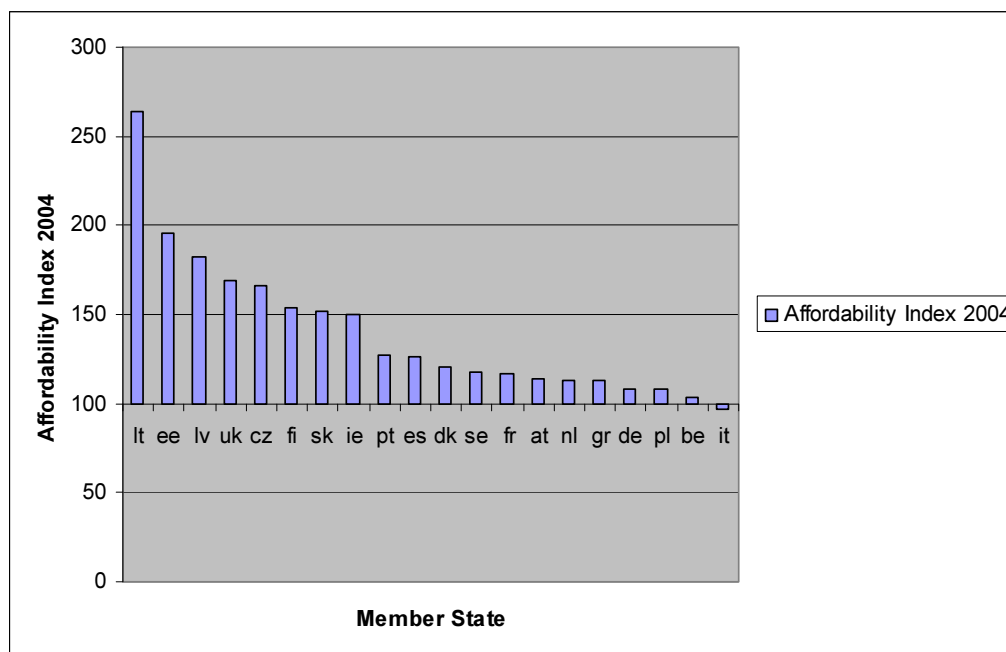
**Figure 3-1: Changes in the affordability of alcohol in The Netherlands, 1996-2008**

### 3.2 Changes in alcohol affordability in Europe

The figure below gives an overview of the change in affordability, since 1996, for twenty countries for which we have *both* relative price and income data. It shows that the affordability of alcohol has increased in all countries, apart from Italy – that is, in most



countries alcohol has become more affordable over the last twelve years.<sup>21</sup> The largest increase in affordability occurred in Lithuania, Estonia and Latvia. In eight countries (Lithuania, Estonia, Latvia, the UK, Czech Republic, Finland, Slovakia and Ireland) affordability of alcohol increased by 50% or more.



Source: Eurostat, author calculations

**Figure 3-2: Changes in the affordability of alcohol between 1996 and 2004, selected EU countries**

Our analysis of the data indicates that for 2004 the increase in the affordability of alcohol in some countries was driven primarily by increases in (real) disposable income: we find the highest changes in (real) disposable income in Lithuania (143%), Latvia (103%), Estonia (56%), the UK (50%), Ireland (47%) and Finland (29%) (these are also the countries with the highest increase in affordability).

By contrast, in other countries increases in affordability were driven primarily by changes in the relative price of alcohol. The greatest falls in the relative price of alcohol occurred in Slovakia (-27%), Estonia (-21%), Finland (-16%), Poland (-14%) and Denmark (-12%). The only countries with an increase in relative prices (taking into account changes in inflation) are Cyprus (21%), Latvia (3%), Italy (3%) and France (1%).

<sup>21</sup> The fact that the affordability of alcohol in Italy has actually decreased over the time period studied here may reflect changes in alcohol consumption in the country in the last few decades. Overall alcohol consumption has declined considerably since the 1970s in Italy, traditionally a wine-drinking country, driven primarily by a decline in wine consumption (Simpura 1998). As a result it has been argued that a response from the wine industry has been to switch from the production of cheaper wines (which were a 'necessity' for Italian consumers who used to drink wine with their meals) to the production of more expensive, luxury wines (A. Allamani, personal communication), thus leading to a decrease in the affordability of alcohol.

Overall, however, our analysis indicates that across the EU, 84% of the increase in alcohol affordability was driven by increases in income, and only 16% was driven by changes in alcohol prices.<sup>22</sup> This is primarily because while incomes went up considerably across the EU, the relative price of alcoholic beverages has remained relatively stable – or fallen at a lower rate than the income increases – in most of the EU countries included in this analysis. From a policy perspective this can be seen as an indication that alcohol pricing policies in the EU, such as taxation, have not for the most part been used effectively to keep the price of alcohol high in order to control consumption and reduce harms. To the extent that a public health strategy focuses on alcohol prices alone (e.g. by trying to keep alcohol prices relatively constant) and does not take into account increases in income that drive affordability up, alcohol pricing policies may fall short of the aim of curbing consumption and harms.

It is clear that an examination of alcohol affordability is interesting from a policy perspective. For example, the analysis suggests that should we find that alcohol consumption and harms go up in those countries where changes in affordability were driven primarily by changes in *real disposable income*, governments are unlikely to be able to keep the affordability of alcohol down unless they can exercise a *significant* influence on the price of alcohol. That is, if income goes up the affordability of alcohol will go up as well unless the relative price of alcohol also increases on a par with, or more than, the rate of income growth. Conversely, we may find that consumption and harms did *not* increase in those countries where a growth in real disposable income was the main driver of increases in affordability. This could merely reflect a low income elasticity in the demand for alcohol (whereby prices stay low to reflect this demand). In this case, the use of taxation to reduce consumption and harms from current levels may need to be reconsidered.

### 3.3 Alcohol affordability among young people

Studies have shown that young people are sensitive to alcohol price changes, and that price increases lead not only to reduced frequency of drinking but also to smaller quantities drunk in each drinking event.<sup>23, 24</sup> While there is extremely limited evidence of the impact of alcohol *affordability* on youth drinkers, this extensive body of research on young people's responses to changes in the *price* of alcohol suggest that youth drinkers may also be responsive to changes in the affordability of alcohol. This section examines the change

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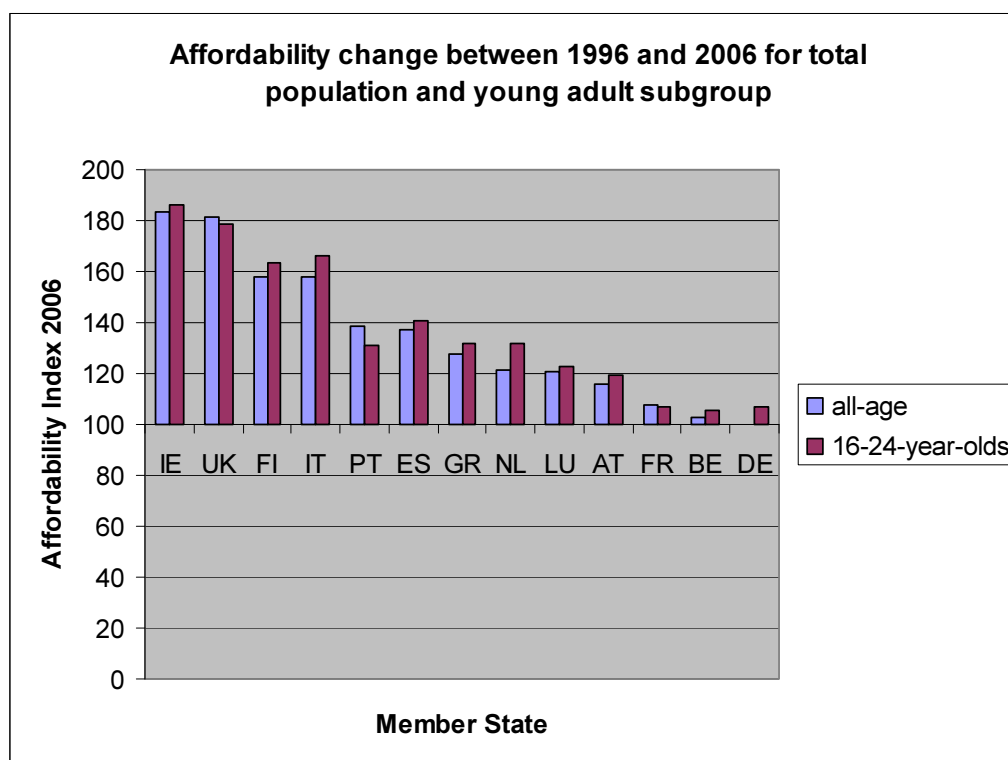
<sup>22</sup> The calculation is based on a double-log regression of the affordability index on the price index and income index – suppressing the constant term.

<sup>23</sup> See for example, Anderson 2007; Meier *et al* 2008a. This is also discussed in greater detail in Chapter 4 of this report.

<sup>24</sup> As discussed in greater detail in Chapter 4, a meta-analysis by Gallet (2007) finds that while teenagers are quite responsive to price changes, they can be less responsive to price than other people. The author suggests that this counter-intuitive result about teenage responsiveness to price may be due to compositions of drinking bundles – a significant proportion of young people's drinking is of beer, for which demand is less elastic across the population than for wine and spirits.

in the affordability of alcohol among young people (i.e. age 16-24), which is plotted in the figure below.<sup>25</sup>

The figure below shows that in almost all countries for which data for the 16-24 age group was available the affordability of alcohol increased more for young consumers (age 16-24) than for all consumers. This difference is most marked in The Netherlands and Italy.



Source: Eurostat, author calculations

**Figure 3-3: Changes in the affordability of alcohol between 1996 and 2006 for total population and young adult sub-group (16-24), selected EU countries**

Assuming that *all* consumers face the same prices, this difference in affordability change reflects purely the difference in income change. What the above figure captures is that the *income* of young people has increased by a greater percentage than that of the general population. What is not captured are changes in the price of drinks that young people particularly like, changes in the price of drinks – in, for example, university bars – or changes in price promotions which, with young people being more price sensitive, are more likely to be taken up by young people.

<sup>25</sup> Please note that the affordability measure here is based on mean equivalized net income, not disposable income as used previously. This leads to significant differences in the results found for particular countries, most notably Italy where mean equivalized net income has increased significantly in real terms but disposable income has fallen. As a result, the affordability changes seen here do not match up exactly with those in the analysis using disposable income-based affordability.

While the difference in the increase in affordability for young consumers on the one hand, and for all consumers on the other is not very significant, its impact on youth alcohol consumption is still unclear. As mentioned above, existing research shows that the income and price elasticity of demand for alcohol is different for young consumers than it is for all consumers – that is, an equal change in the affordability of alcohol tends to lead to a larger change in consumption by young people than by consumers as a whole.

While there is limited evidence comparing the impact of alcohol *affordability* between young people and consumers as a whole, this issue has important implications for alcohol policy especially across the EU, where there is growing recognition of the high incidence of hazardous youth drinking.<sup>26</sup>

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<sup>26</sup> See for example <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/06/1455> (last accessed September 2008), World Health Organization (2001) Declaration on young people and alcohol, 2001 ([http://www.euro.who.int/AboutWHO/Policy/20030204\\_1](http://www.euro.who.int/AboutWHO/Policy/20030204_1), last accessed September 2008).

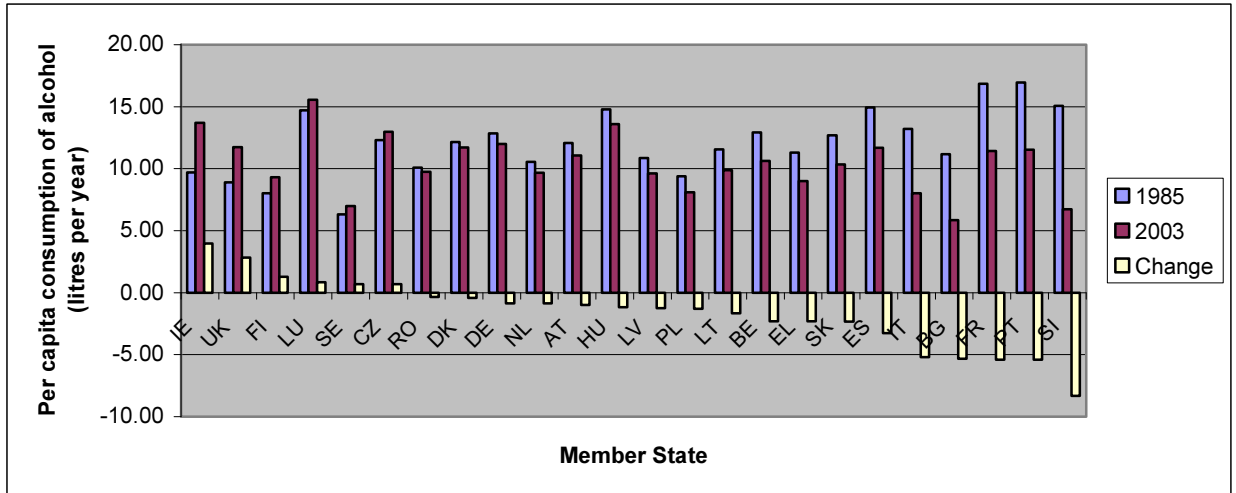
#### 4.1      **Consumption trends in the EU**

Alcohol consumption has been in decline in Europe for a number of years. Between 1985 and 2003, reductions in consumption occurred in eighteen of the twenty four countries for which data are available.<sup>27</sup> Southern European (wine-producing) countries have experienced particularly significant per capita consumption reductions over this period, with France, Italy and Portugal all reducing per capita alcohol consumption by the equivalent of more than 5 litres of pure alcohol per person per year. Although we do not have access to comparable data across the EU for years prior to 1985, other researchers have found that the decline in consumption in southern Europe has been evident over a longer period; consumption in Italy, Portugal and Spain apparently peaked in the 1970s, while consumption in France has been declining since the 1960s (Gual and Colom 1997).

In contrast, between 1985 and 2003, Ireland and the UK experienced increases in consumption, but across Europe as a whole the decreases in consumption clearly outweigh the increases, and the figure below indicates. It is worth noting, however, that these changes in overall consumption across the EU do not imply a convergence in the amounts of alcohol consumed in the different MS.

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<sup>27</sup> Data extracted from the World Health Organization Global Information System on Alcohol and Health, accessed from [http://www.who.int/globalatlas/LoginManagement/autologins/gad\\_login.asp](http://www.who.int/globalatlas/LoginManagement/autologins/gad_login.asp) (July 2008). At the time of analysis data for years after 2003 were available for only a small number of countries, and therefore not suitable for our own use.

**Figure 4-1: Overall alcohol consumption: change between 1985 and 2003**

Source: World Health Organization Global Information System on Alcohol and Health

It is not just overall alcohol consumption that has changed. Consumption patterns for particular alcoholic beverages have also changed within countries over time, with some evidence of convergence in drinking habits across the EU. In 1985, beer, wine and spirits were each the primary vehicle for alcohol consumption in a number of states. However, by 2003 the majority of ‘spirit-drinking’ states (and even some ‘wine-drinking’ states) had become ‘beer-drinking’ states.

Even when the dominant drink in a country does not change, there are some significant developments. For example, France, Italy and Portugal, despite remaining wine-drinking countries, experienced a very large drop in wine consumption. Denmark, the UK and The Netherlands, despite remaining beer-drinking countries, experienced slight declines in beer consumption and larger increases in wine consumption.

**Table 4-1: Alcohol consumption by three main types of beverage (litres of pure alcohol consumed per capita per year via each beverage type)**

1985			Member State	2003		
Spirits	Wine	Beer		Beer	Wine	Spirits
1.78	4.6	6.81	Austria	6.59	3.91	1.62
2.61	3.08	7.45	Belgium	5.81	3.06	1.64
4.08	2.82	4.02	Bulgaria	0.46	2.75	2.45
4.61	2.3	9.16	Czech Republic	9.27	2.18	4.49
1.97	2.79	7.44	Denmark	5.93	4.45	1.38
3.75	0.83	3.48	Finland	4.37	2.41	2.53
2.95	11.1	2.54	France	2.18	6.55	2.89
2.82	3.35	8.66	Germany	6.9	3.05	2.35
3.56	5.21	2.11	Greece	2.36	4.35	1.87
6.95	3.49	5.92	Hungary	4.31	4.91	4.18
2.57	0.55	7.74	Ireland	8.95	2.12	2.53
1.62	10.29	1.37	Italy	1.75	6.08	0.47
6.55	2.34	1.68	Latvia	2.17	0.47	7.24
n/a	n/a	n/a	Lithuania	4.54	1.1	4.25
1.97	7.41	7.32	Luxembourg	6.27	8.98	1.98
2.78	2.05	5.25	Netherlands	4.82	2.64	1.84
6.18	1.17	1.98	Poland	4.77	1.58	1.57
1.03	12.38	2.46	Portugal	3.53	5.55	1.68
2.65	4.09	2.95	Romania	4.03	3.04	2.4
4.5	2.6	6.72	Slovakia	5.38	1.74	4.26
3.15	8.63	3.3	Slovenia	3.77	2.01	0.96
3.64	6.86	3.97	Spain	4.57	3.93	2.8
2.5	1.55	2.85	Sweden	3.3	2.22	1.12
2.13	1.36	6.75	United Kingdom	6.21	2.71	2.2

Source: World Health Organization Global Information System on Alcohol and Health

NOTE: Yellow shading reflects most widely consumed beverage within each country.

Several factors may have influenced the downward trend in alcohol consumption in our data, although it is difficult to disentangle the effects of these factors and assess their relative importance as they are highly interrelated (Leifman 2001). Competition from non-alcoholic beverages may have contributed to reduced consumption of alcoholic beverages, and the more aggressive marketing of beer and spirits may have contributed to the relative decline in wine consumption even in the wine producing countries (Gual and Colom 1997). The table above, for example, shows a change in preference in some countries between 1985 and 2003; for example, whereas in 1985 wine was the preferred beverage in Spain, Slovenia and Romania, by 2003 the largest consumption in those countries was of beer. Population ageing may have had an impact in changing drinking patterns and preferences across the EU. Urbanisation (and related societal changes) may play a role in declining consumption in southern countries, as city dwellers tend to consume less alcohol than rural citizens in those countries<sup>28</sup> (Karlsson and Simpura 2001).

<sup>28</sup> In some other countries, such as Finland, the urbanisation process is associated with increased alcohol intake, as drinking is higher in urban areas in those countries

Public policy may have contributed to the consumption trends, as the number (and strictness) of alcohol policies has generally increased over time, particularly in the southern countries which have traditionally had fewer (and less strict) policies in this area (Karlsson & Österberg 2001; Leifman 2001). As a result of government campaigns and other sources of public health information, the public may also have become more aware of the potential harms associated with excessive alcohol consumption (Gual and Colom 1997).

Chapter 3 demonstrated that the affordability of alcohol has been increasing over time, but the overall per capita consumption of alcohol has fallen. This indicates that if affordability had remained constant, a greater decrease in overall alcohol consumption across the EU would have been expected. That is, even if affordability of alcohol has the typically hypothesised positive relationship with consumption of alcohol *when all other factors are held constant*, the positive correlation might be obscured when other factors are changing at the same time as affordability. The factors described above provide some context for our analysis in this Chapter, where we use econometric techniques to isolate the relationship between affordability and consumption from the other changes taking place over time.

#### 4.1.1 Binge and youth drinking trends in the EU

According to research conducted for the EC, binge drinking across Europe increased in the period 2003-2006, when over 80 million Europeans over 15 reported binge-drinking (defined as having five or more drinks on one occasion) at least once a week (Anderson 2008). Binge drinking is often seen as a problem for young adults, with twenty four per cent of young drinkers (aged 15-24) reporting binge drinking at least once a week in 2006 (*ibid.*). However, binge-drinking is also prevalent among other age groups, including those over 55 (of whom 18% reported binge-drinking) (*ibid.*).

Binge-drinking by young adults is a growing policy concern at MS and EU level, although the levels, and the trends in those levels, vary across the EU. Youth binge drinking appears to be more prevalent in countries such as the UK, Ireland, Scandinavian countries, Portugal and the Czech Republic (in all of which over 15% of youth drinkers reported binge-drinking three times or more during the last month), and less so in Italy, France, Poland and Greece (in which fewer than 14% reported binge-drinking) (Hibell *et al.* 2004).

In terms of trends in binge drinking, the European School Survey Project on Alcohol and Other Drugs (ESPAD) study reports that the proportion of young drinkers who reported binge-drinking increased in many countries between 1999 and 2003, including Sweden, Ukraine, Estonia, Bulgaria and Portugal (Hibell *et al.* 2004). In other countries, including Denmark, Greece, Hungary and Poland, the prevalence of binge-drinking among young people decreased during the same period (*ibid.*).

## 4.2 Affordability and consumption: previous research

As discussed previously, we investigated changes in the affordability of alcohol by examining changes in the relative price of alcohol over time (compared with other goods) and changes in disposable income over time. The affordability index then shows how the



affordability of alcohol has changed compared with a base year. Owing to data limitations, our analysis is confined to changes in affordability between 1996 and 2003.

While some recent alcohol research has used the concept of alcohol *affordability* as a key economic variable (e.g. Meier *et al.* 2008a; NHS Information Service 2008), much previous research in this area has focused on the effect of alcohol price and/or disposable income on alcohol consumption. Due to the large amount of literature published in these areas, in this section we focus on findings from published meta-analyses and reviews, using individual papers for illustration where relevant.<sup>29, 30</sup>

#### Price and income elasticity

Elasticities are used by economists to express the relationship between a change in one variable (often price or income) and the associated change in another variable (often the amount of a good demanded or the amount of a good supplied). In order for elasticities to have comparable meanings in different settings, they are expressed in terms of *percentage changes* – the price elasticity of demand, for example, represents the percentage change in the amount of a good purchased associated with a 1% increase, or decrease, in price.

When the absolute value of elasticity is greater than 1, the demand is considered ‘elastic’ – a 1% change in price produces more than a 1% change in demand; when the absolute value is less than 1, the demand is considered ‘inelastic’ – a 1% change in price produces less than a 1% change in demand; when the absolute value is exactly 1, the demand is described as ‘unit-elastic’.

Elasticities can refer to the short-run or the long-run reaction to a change. Typically, long-run price elasticities are larger than the short-run price-elasticities, because people have more flexibility in the long run. In the short run, some people already have a stock of items to be consumed and do not react immediately to a price change; people are already committed to certain activities and expenditures, and may not be able to change this easily in reaction to a price change. In the long run, people are less constrained and can more easily change their purchasing behaviour to reflect the new prices of goods.

#### 4.2.1 Price elasticity

A significant number of studies have addressed the relationship between the price of alcohol and its consumption: in a recent meta-analysis of alcohol demand, researchers synthesised the results from 112 English-language studies that met their inclusion criteria, and found ‘statistically overwhelming evidence of effects of alcohol pricing on drinking’ (Wagenaar *et al.* 2008). For each beverage increases in price were associated with decreases in consumption, with beer (mean elasticity: -0.46) somewhat less responsive to changes in price than wine (-0.69) and spirits (-0.80). These mean elasticities are similar to the

<sup>29</sup> Large meta-analyses and reviews give a reflection of the balance of evidence in an area of research. There is typically a range of results represented within a meta-analysis, with some papers finding larger effects than the meta-analysis, and others finding smaller effects, no effect or the opposite effect. As results from across the full range of papers are already incorporated within these meta-analyses, it does not make sense to cherry-pick any of those papers in isolation as supporting (or opposing) the basic conclusions of the meta-analyses. However, we do use individual papers as suggestive evidence for nuances not directly addressed by the meta-analyses.

<sup>30</sup> For another recently published ‘review of reviews’, see Meier *et al.* (2008a).

median elasticities reported by Gallet (2007), who found in his meta-analysis that consumption of beer is less responsive (median elasticity: -0.36) to changes in price than wine (-0.70) and spirits (-0.68).<sup>31</sup>

A large-scale modelling exercise performed on English and Welsh data (published too recently to be included in the meta-analyses above) estimates for each type of beverage a range of different own-price and cross-price elasticities for on-trade, off-trade, high-price and low-price drinks. The study finds a consistently negative relationship between own-price and consumption; as in the meta-analyses, the responses are negative but inelastic - a 1% increase in own-price is associated with a less than 1% decrease in consumption (Meier *et al.* 2008b). Unlike in the meta-analyses, there is little difference between the elasticities of beer and wine in the Meier *et al.* study, while consumption of spirits is clearly more sensitive to price than consumption of beer or wine.<sup>32</sup>

An important issue regarding responses to price changes is the extent to which consumers substitute with cheaper drinks rather than reduce their overall levels of drinking when the price/affordability of alcohol increases. A study by Gruenwald *et al.* (2006) shows that in response to alcohol price increases, consumers substitute with cheaper alcoholic beverages, or purchase their drinks in cheaper venues. However, the study also provides evidence that a price increase that resulted in higher prices for lower-quality beverages would lead to a 4.2% drop in alcohol sales. This indicates that while price changes have an important effect in changing what people drink or where they purchase their drinks, increases in the price of the cheapest alcoholic beverages do lead to reductions in consumption levels as consumers have no cheaper alcoholic alternative.

Responses to changes in the price of alcoholic beverages also vary by socio-economic and demographic groups. Given growing concerns across the EU about youth drinking, particularly the increasing incidence of binge drinking among young drinkers, this is an issue of great policy relevance. Gallet (2007) cites the finding that while both older people and teenagers are quite responsive to price changes, teenagers can be less responsive to price than other people. The author suggests that this counter-intuitive result about teenage responsiveness to price may be due to compositions of drinking bundles – a significant proportion of young people's drinking is of beer, for which demand is less elastic across the population than for wine and spirits. In addition, Gallet's analysis is unable to compare young beer drinkers with older beer drinkers, which would presumably allow this issue to be unpicked in more detail.

#### 4.2.2 Income elasticity

Gallet (2007) also includes income elasticities in his meta-analysis. As some alcohol studies focus solely on price effects, and few focus exclusively on income effects, the number of

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<sup>31</sup> Differences between the reported elasticities of these two meta-analyses may be explained a) by the difference between a mean and median result, b) by the selection of papers in each analysis (Gallet uses papers up to 2003, Wagenaar *et al.* use additional papers from 2004-2007), and c) by methodological differences (Wagenaar *et al.* weight the importance of each study estimate according to its precision, Gallet weights all study estimates equally)

<sup>32</sup> This difference may reflect a characteristic of drinking behaviour in the UK, as it is consistent with results from Huang (2003) and Selvanathan and Selvanathan (2005)

published income elasticity estimates used in the meta-analysis is slightly smaller than the number of price elasticity estimates, but it is still substantial.<sup>33</sup> Again, income elasticities appear to vary across beverage types: in the meta-analysis, beer consumption is positive and inelastic (median elasticity: 0.39), wine consumption is elastic (1.10) and spirit consumption is exactly unit-elastic (1.00). This analysis might suggest that beer is a ‘staple’ item for the median person, with consumption not so responsive to income changes, while wine is a ‘luxury’ item to be bought when income is high but something that is cut if income falls.

It is interesting to note that research has found that economic stress and material deprivation can increase alcohol consumption, including binge-drinking (e.g., Kuntsche *et al.* (2004)). There is also evidence that people in low socio-economic groups may be even more responsive than other groups to changes in the affordability of alcohol, most likely because alcohol would take up a greater proportion of their income. That is, decreases in the affordability of alcoholic beverages lead to greater decreases in consumption among these groups than among others (Sutton and Godfrey 1995).

#### 4.2.3 Cross-country differences in price and income elasticities

With both income and price elasticity, it is important to bear in mind that simple reports from aggregate meta-analyses obscure differences across and within countries. It is often difficult to find data that allow detailed breakdowns of elasticities by subgroups within a country; many studies are based on aggregate-level data. Furthermore, in meta-analyses that seek to establish and quantify the basic relationship between alcohol consumption and price or income, cross-country differences are often not a particular subject of interest, and data limitations preclude robust meta-estimates for most countries.<sup>34</sup>

The idea of elasticities being different across different countries is intuitively appealing – given that beer, wine and spirits play different roles in different countries, we might expect price and income changes to produce different results – and receives empirical support from studies such as that by Selvanthanan and Selvanthanan (2005). These studies found that consumption of beer was less responsive to changes in price than wine or spirits in most of the ten countries in their study (but not in Sweden or France), and that wine consumption reacted elastically<sup>35</sup> to income changes in half the countries (Australia,

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<sup>33</sup> For example, from mining 132 studies, Gallet has 1024 short-run price elasticity estimates and 901 short-run income elasticity estimates to use in his meta-analysis.

<sup>34</sup> Gallet (2007) mentions ‘jointly significant’ country variables in his paper, but does not include these in the tables of results; Wagenaar *et al.* (2008) use a random effects model that treats country factors as just one component of study-level effects. Without multiple studies from each country of interest, there is not sufficient variation to separate country effects from other characteristics in a meta-analysis. Fogarty (2006) does examine cross-country variation, but only four of his eighteen countries have five or more elasticity estimates for each beverage, and he does not include any papers published more recently than 1991, making it difficult to establish the accuracy of his claim (in contradiction to Gallet’s more recent analysis) that there is no effect of country-specific ‘tastes’ on own-price elasticities of alcoholic beverages.

<sup>35</sup> i.e. a 1% increase in income is associated with a greater-than-1% increase in consumption.

Canada, Finland, Norway and the US), and inelastically<sup>36</sup> in the others (France, Japan, New Zealand, Sweden and the UK).

Looking specifically at European countries, Leppänen *et al.* (2001) found income elasticity of alcohol to be broadly similar across all European countries, but found price elasticity to vary depending on whether the country was a wine-producing southern country, a Scandinavian country with alcohol monopolies or one of the other countries. Unfortunately, the researchers did not have data by beverage, so it is not possible to compare beverage-specific elasticities from this study with the larger meta-analyses, and the aggregate alcohol results may mask relevant cross-beverage differences. While the study supports the presence of cross-country heterogeneity in price elasticity, the evidence is overwhelmingly that consumption in different countries consistently reacts negatively to price increases and positively to income increases, even though the *extent* of these reactions may vary between countries.

### 4.3 The link between alcohol affordability and consumption in the EU

In this section we report the findings of our data analysis of the relationship between alcohol affordability and consumption. The analysis is based on publicly available data from Eurostat and the WHO (Global Information System on Alcohol and Health). We include twenty EU countries for which data are available (AT, BE, CY, DE, DK, EE, ES, FI, FR, GR, IE, IT, LT, LV, NL, PL, PT, SE, SK, UK) in our analysis. The data spans the years 1996-2003.

We use a first-difference approach to explore the relationship between alcohol affordability and consumption. That is, we look at annual changes in affordability and consumption rather than absolute levels. Our model suggests a short run elasticity of 0.22 (which means a 0.22% increase in consumption following a 1% increase in affordability within one year of a change in affordability) and a long run elasticity of 0.32 (which is, a total response of 0.32% in consumption following a 1% increase in affordability).

#### 4.3.1 Estimation strategy

We use a first-difference approach that allows us to take account of the fact that our variables show significant linear trends over time. This is explained in more detail in the rest of this section.

The first thing to note when estimating the relationship between alcohol affordability and consumption is that a straightforward strategy of simply regressing consumption on affordability is not useful. Both the affordability and consumption series display long term trends (in some cases both increasing over time). In addition, other factors that affect consumption (besides affordability) can be expected to have long-term trends during the period of observation. These trends make it harder to attribute changes in consumption to changes in affordability confidently – since there is a danger of associating independent trends with each other only.

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<sup>36</sup> i.e. a 1% increase in income is associated with a less-than-1% increase in consumption.

### Regression analysis

**Regression analysis** involves identifying the relationship between a dependent variable and one or more independent variables.

The dependent variable in the regression equation is modelled as a function of the independent (or effect) variables, corresponding parameters and an error term. **The error** term is treated as a random variable. It represents unexplained variation in the dependent variable.

A **dummy variable** is a special type of variable – which typically allows for only two possible outcomes. For analysis one of the outcomes is coded a 1 and the other a 0.

What this suggests, in technical terms, as Norström and Skog (2001) point out – is that in the regression model:

$$Consumption_{it} = constant + \beta_1 Affordability_{it} + \varepsilon_{it} \quad (1)$$

(where  $Consumption_{it}$  and  $Affordability_{it}$  refer to consumption and affordability in country i and time t), the error, or noise term  $\varepsilon_{it}$  is non-stationary.

As shown by Box and Jenkins (1976) and Skog (1988), if  $\varepsilon_{it}$  is non-stationary, the resulting estimate of the effect parameter  $Affordability_{it}$  is very unreliable and its standard errors severely biased. One way of dealing with this problem is to include a time trend on the right-hand side of the equation (as below):

$$Consumption_{it} = constant + \beta_1 Affordability_{it} + \beta_2 time + \varepsilon_{it} \quad (2)$$

The time component (t) takes care of linear (or in case of high-order polynomials, curvilinear) trends – preventing the mere association of independent trends. The main problem with this approach is that, besides being ad hoc, it creates a collinearity problem. That is, because of the strong trends in alcohol affordability, we expect a high correlation between the time variable and affordability – which results in inflated standard errors.

### Additional aspects of regression analysis

**(Multi-)Collinearity** arises when two independent variables are closely correlated, creating a situation in which their effects are difficult to separate. The problem does not result in biased coefficient estimates, but does increase the **standard error** (which is a measure of the extent to which the sample mean fluctuates) of the estimates and thus reduces the degree of confidence that one can place in them.

**Statistical significance** provides for the probability that a result is not due to chance alone. Level of significance determines degree of certainty or confidence with which we can rule out chance. Statistical significance does not equate to value.

**R squared** is the relative predictive power of a model. It is a descriptive measure between 0 and 1. The closer it is to 1, the better a model is to predict. A value of R squared equal to 1 (which only occurs in fairy tales and textbook exercises) would imply that your model provides perfect predictions.

An additional problem with the model is that to the extent that trends are non-linear, so that a polynomial in time is needed, this means that we would lose several degrees of freedom – when including trend variables. As the number of observations in our data is relatively small this is a high price to pay.

A better approach to dealing with the problem of non-stationarity is suggested by Norström and Skog (2001). They propose to estimate the relationship of alcohol consumption and affordability in first differences. That is, they suggest looking at annual changes in consumption and affordability rather than absolute levels. Letting  $\Delta$  denote the differencing operator, so that  $\Delta C_{it} = C_{it} - C_{it-1}$ , equation 2 becomes:

$$\Delta Consumption_{it} = \beta_1 \Delta Affordability_{it} + \Delta \varepsilon_{it} \quad (3)$$

(Note that the intercept has disappeared from the equation).

The main advantage of this approach, compared to equation 2, is that the differenced series becomes ‘stationary’ – and so the aforementioned estimation problem disappears. It is worth noting, that the technique works typically, even if the trends are multi-directional – that is, change over the period of observation.

A further advantage concerns the epistemological dimension of the specification: “The concept of causality is defined in terms of changes (or events): a change in a causal factor brings about an effect – i.e. a change in the effect variable” (Norström and Skog, 2001). So, differencing of the series is exactly what is needed in order to see if, and to what extent, a change in alcohol affordability is accompanied by a change in consumption.<sup>37</sup>

Finally, estimating the relationship between alcohol affordability and consumption in first differences provides the advantage of eliminating cross-country, time-invariant effects – such as differences in culture and/or differences due to different recording methods (to the extent that they stay relatively stable over time).

To account for common time effects across all countries we include a full set of time dummies in our model. We estimate equation 3 in natural logarithms (log-differences). This allows interpretation of the coefficients ( $\beta$  s) as elasticities. That is, it gives the percentage change in consumption associated with a 1% change in affordability.<sup>38</sup>

#### 4.3.2 Data

Our analysis is based on publicly available data. Affordability (or more specifically, relative price index and disposable income<sup>39</sup>) data are from Eurostat.<sup>40</sup> Consumption data are

<sup>37</sup> We do not expect further temporal structure in our data.

<sup>38</sup> It is worthwhile bearing in mind that while taking the natural logs makes it easy to interpret coefficients as elasticities, it imposes a functional form – i.e. constant elasticity of demand.

<sup>39</sup> As mentioned in the previous chapter, we also considered using discretionary income, but no appropriate data were available. We would not expect to find significant differences in our estimation results using discretionary income, since we are looking at *changes* over a relatively short time period.

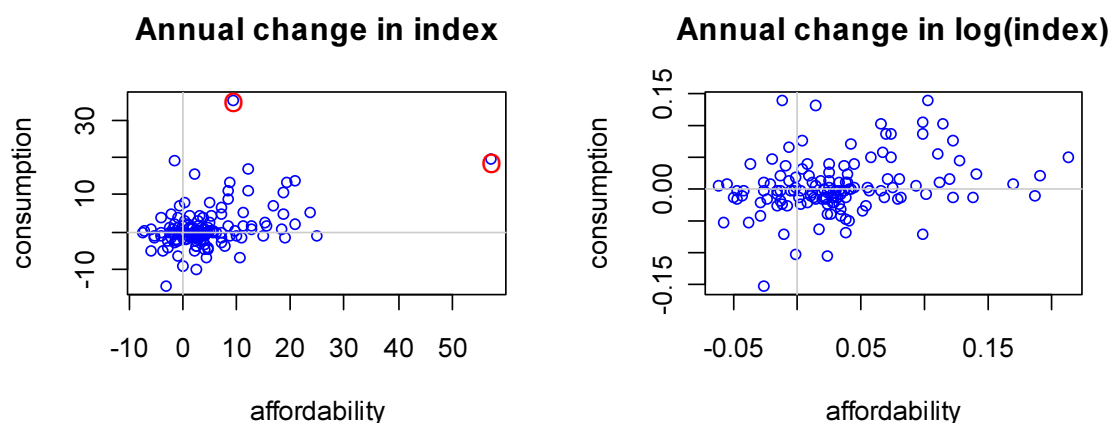
<sup>40</sup>

[http://epp.eurostat.ec.europa.eu/portal/page?\\_pageid=1090,30070682,1090\\_33076576&\\_dad=portal&\\_schema=PORTAL](http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1090,30070682,1090_33076576&_dad=portal&_schema=PORTAL) (accessed August 2008).

drawn from the WHO's Global Information System on Alcohol and Health.<sup>41</sup> The price index data are based on off-trade prices only.<sup>42</sup> The consumption data reflects total recorded adult (15+) alcohol consumption in litres.

As explained above, we calculate the affordability index and consumption index for twenty EU countries (AT, BE, CY, DE, DK, EE, ES, FI, FR, GR, IE, IT, LT, LV, NL, PL, PT, SE, SK, UK) for the years 1996-2003, and set them equal to 100 in 1996 for all countries.

**Figure 4-2: Annual change in affordability and consumption index**



The graph on the left shows the annual changes in the affordability index (horizontal axis) and consumption index (vertical axis). There are two clear outliers (Estonia, change between 2002 and 2003; and Lithuania, change between 1999 and 2000). We decided to remove these from our dataset. They could have a large effect on the outcomes of our analyses, while not being representative for a typical scenario of interest.

#### 4.3.3 Results

The table below shows the estimated parameters of our regression model (column 1), together with their (robust)<sup>43</sup> standard errors. The coefficient of affordability suggests that a 1% increase in affordability can be associated with a (statistically significant) 0.25% increase in consumption on average.

<sup>41</sup> <http://www.who.int/globalatlas/default.asp>

<sup>42</sup> To the extent that on-trade consumption is likely to be more sensitive to changes in affordability, we would expect our estimates to understate the true “affordability elasticity”.

<sup>43</sup> In regression with robust standard errors the estimates of the regression coefficients are the same as in the standard OLS linear regression but the estimates of the standard errors are more robust to failure to meet assumptions concerning normality and homogeneity of variance of the residuals.

**Table 4-2: Estimation results consumption**

Variable	Model 1			Model 2		
	Coefficient	Robust SE	Sign.	Coefficient	Robust SE	Sign.
Affordability	0.245	0.070	*** <sup>44</sup>	0.222	0.094	**
Consumption lagged				0.322	0.085	***
Time dummy 1997	-0.200	0.013		-0.026	0.012	**
Time dummy 1998	0.010	0.010		0.017	0.011	*
Time dummy 1999	-0.020	0.010		-0.004	0.011	
Time dummy 2000	-0.018	0.009	*	-0.023	0.011	**
Time dummy 2001	0.009	0.011		0.012	0.012	
Time dummy 2002	-0.007	0.009		-0.012	0.009	
Adj. R squared	0.167			0.2666		
N	132			112		

We also estimate a slight modification of the model: in order to allow for dynamic effects, we include the lagged dependent variable ( $Consumption_{it-1}$ ) as an explanatory variable. The idea is to test whether and to what extent individuals adjust their behavior with a delay.

$$\Delta Consumption_{it} = \gamma_1 \Delta Consumption_{it-1} + \beta_1 \Delta Affordability_{it} + \Delta \varepsilon_{it} \quad (4)$$

The estimation of a dynamic model makes it possible to distinguish between short-term and long-term effects. In our study, ‘short term’ refers to the effect on consumption occurring within one year of a change in the relevant variable, whereas long-term measures the total response to a change in the independent variable over time.<sup>45</sup>

<sup>44</sup> \*\*\* means statistically significant at the one percent level, \*\* at the 5 percent level and \* at the 10 percent level.

<sup>45</sup> In this specification the lagged dependent variable – by construction – becomes correlated with the error term. We could use an instrumental variable approach to correct for this. Following Katz and Beck (2004), however, we ignore the potential bias because our sample seems long enough.



According to equation 4, the coefficient of the independent variable ( $\beta_1$ ) should be interpreted as short-term elasticity. The long-term elasticity is  $\beta_1 / (1 - \gamma_1)$ ,<sup>46</sup> where  $(1 - \gamma_1)$  is the adjustment factor measuring the speed of adjustment: the greater the value of  $\gamma_1$  the slower the speed of adjustment and the greater the difference between short-term and long-term elasticities.

The results in the table above (column 2) show that the model provides a better overall statistical fit than our initial specification (with an adj. R square of 0.27 compared to 0.17). It suggests a short run elasticity of 0.22 (which is slightly lower than in the first specification) and a long run elasticity of 0.32 (suggesting a total increase of 0.32% following a 1% increase in affordability). Both coefficients are highly statistically significant.<sup>47</sup>

#### 4.3.4 Limitations

Our discussion of affordability and consumption in this and the previous chapter suggests that there is significant variation in these variables 1) across countries and 2) within countries over time. It is therefore perfectly conceivable, and even likely, that the *relationship* between these variables also varies across countries and potentially over time.

Unfortunately, our data do not allow us to estimate the elasticities of affordability and consumption for each country or different time periods separately. This means that we cannot exclude the possibility that our results hide significant differences between countries and/or over time. Nevertheless, our review of existing literature suggests that it is unlikely that the elasticities are negative (i.e. that increases in affordability are associated with decreases in consumption) in any country.

Regressing alcohol consumption on affordability raises the issue of simultaneity (or direction of causality). The best way to think about the problem is in terms of price and consumption. If we run a regression of consumption on prices and find a positive association between the two, what does that mean?

One explanation would be that as prices go up (down), people consume less (more) and so total consumption goes down (up). Another explanation for the finding, however, could be that as consumption goes down (up), retailers start to charge higher (lower) prices.

What this suggests is that, in the case of price and consumption, we cannot be certain in which direction causality runs. To the extent that affordability to some extent is driven by price, we need to ask whether simultaneity is also an issue for our specification (looking at affordability and consumption).

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<sup>46</sup> This follows from a simple transformation – exploiting the properties of ‘geometric series’.

<sup>47</sup> We also estimated the model using lagged differences in (log) prices as an instrument for lagged differences in (log) consumption. Using this approach should mitigate possible problems regarding simultaneity bias and reduce collinearity problems. Our findings are consistent with the findings presented in table 4-2: The coefficient of affordability remains unchanged. The coefficient of lagged differences in (log) prices is -0.25 – suggesting a slightly lower long-run elasticity of 0.3.

The answer to this question is: probably no. The reason is that, as shown earlier, affordability has largely been driven by changes in disposable income (over the time horizon studied). To the extent that there is no obvious reason why changes in consumption should affect disposable income<sup>48</sup> we can be relatively confident that causality does in fact run from affordability to consumption (and not the other way round).

#### Using relative prices instead of affordability

The discussion in this chapter suggests that using the same approach to estimate price and income elasticities (rather than affordability elasticities) is likely to suffer from problems around simultaneity bias.

The list below shows the results from such an estimation exercise. Our intention is to provide a sense of how the two models compare. We do not see this as an alternative model to the one given in the main body of the report but as an extension for those readers who want to get a (rough) sense of how the affordability elasticity can be disaggregated into price and income elasticities:

Variable	Coefficient
Relative price:	-0.460
Disposable income	0.458
Time dummy 1997 <sup>49</sup>	-0.266
Time dummy 1998	0.161
Time dummy 1999	0.159
Time dummy 2000	-0.174
Time dummy 2001	0.100
Time dummy 2002	-0.009
R squared	0.17

#### 4.4 Closing remarks

The balance of evidence presented in the first sections of this chapter indicates that there is a negative relationship between price and consumption, and a positive relationship between income and consumption. In accordance with these findings, our own analysis indicates that there is a statistically significant positive relationship between alcohol *affordability* (a composite measure looking at the effect of price and income) and consumption across the EU. More specifically, we find a short run elasticity of 0.22 and a

<sup>48</sup> Disposable income is defined as total household income, minus payments of income tax and other taxes, social contributions and other current transfers.

<sup>49</sup> As before, we include a full set of time dummies in our regression analysis to account for common time effects across all countries.

long run elasticity of 0.32 (suggesting a total increase of 0.32% following a 1% increase in affordability).

This additional evidence on the positive association between affordability and consumption in Europe contributes to the growing understanding of the way in which drinkers respond to changes in how affordable alcoholic beverages are. The body of research on this issue contributes to an evidence base for alcohol pricing policy. In the next chapter we explore these further by focusing on the association between alcohol consumption and harms.

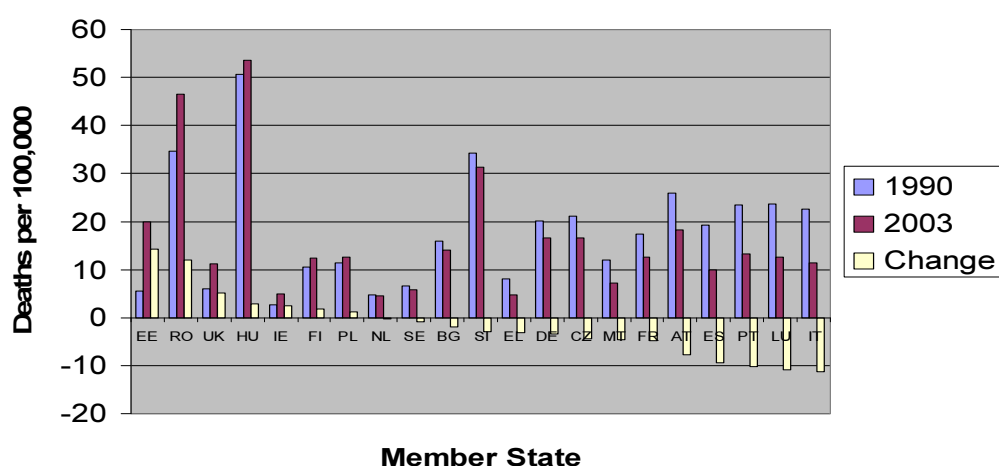


### 5.1 Harms trends in the EU

Alcohol has been linked to a wide range of harms through several different mechanisms. For example, through its direct biological effect, alcohol is associated with liver cirrhosis and other physical damage; through impairment of judgment and motor skills, alcohol is associated with violence, sexually transmitted diseases and accidents (including traffic accidents); through its dependence-forming quality, alcohol is associated with family disruption and other social harm (Rehm *et al.* 2003). Alternatively, harms associated with alcohol can be classified by whether they are related to chronic alcohol consumption or to acute instances of high-risk or high-volume consumption (Chikritzhs *et al.* 2001)

Liver cirrhosis has previously been shown to be closely related to alcohol consumption in Europe and other parts of the world (Single *et al.* 1999; Ramstedt 2001), and is regarded as the ‘classical indicator of alcohol-related problems’ owing to its established relationship with alcohol consumption (Leifman *et al.* 2002). Data on liver cirrhosis have been collected by MS for differing lengths of time; the trend described below is one illustration of harms trends and features all countries for which data were available in 1990 and 2003.

**Figure 5-1: Change in liver cirrhosis deaths per 100,000 in the MS, 1990-2003**



Source: World Health Organisation

Overall, liver cirrhosis has declined between 1990 and 2003, including in fourteen of the twenty-one MS for which we have data for this period, but there is considerable heterogeneity by region: southern European countries have experienced significant reductions in liver cirrhosis over this period, with Spain, Portugal and Italy seeing three of the four biggest reductions across the EU; the largest increases took place in two of the Eastern European countries (Romania and Estonia), while smaller increases were seen in some of the northern countries (Ireland, Finland and the United Kingdom). This geographical variation in liver cirrhosis trends is broadly similar to the geographical variation in alcohol consumption trends described in the previous section.

## 5.2 Alcohol consumption and harms: previous research

As with the link between price/income/affordability and consumption, there is an extensive literature connecting alcohol consumption to a range of negative outcomes; accordingly, as in the previous chapter, this section focuses on findings from published meta-analyses and reviews, using individual papers for illustration where relevant.<sup>50</sup>

Major reviews by Rehm *et al.* (2003) and Gmel and Rehm (2003) identify a full range of outcomes associated with alcohol consumption and review the evidence base for the hypothesised associations. The balance of evidence suggests that increases in the average volume of alcohol consumption '[increase the risk of]: mouth and oropharyngeal cancer; oesophageal cancer; liver cancer; breast cancer; unipolar major depression; epilepsy; alcohol use disorders; hypertensive disease; hemorrhagic stroke; and cirrhosis of the liver' (Rehm *et al.* 2003). Similarly, alcohol consumption is shown to have an effect on coronary heart disease and on injuries (intentional and unintentional), with the additional nuance that it is not only *volume* of consumption but also *patterns* of drinking that are important – e.g. consistent moderate consumption of alcohol might have a different effect from a pattern of irregular heavy drinking episodes, even if the total volume consumed over time were the same in both cases (Rehm *et al.* 2003; Gmel and Rehm 2003). Similarly, a significant body of research has found a strong, causal relationship between alcohol consumption and traffic accidents and fatalities (Babor *et al.* 2003). A peer-review study of this association in fourteen European countries, for example, found a positive, statistically significant relationship between aggregate alcohol consumption and rates of fatal traffic accidents, primarily in central and southern Europe (Skog 2001). Interestingly, the study found that the relationship was not statistically significant in northern Europe, most likely due to stronger compliance in those countries with blood alcohol concentration (BAC) laws (*ibid.*).

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<sup>50</sup> It is worth noting that while the link between alcohol consumption and harms has been extensively studied, there is less understanding of the benefits from (moderate) alcohol consumption aside from a reduced risk of heart disease (over which there is still dispute) – for example, psychological benefits such as mood enhancement, sociability, stress relief, and so forth. In one of the few studies examining this issue in epidemiological terms, the authors argue: 'It is as yet impossible to determine to what extent moderate alcohol consumption causes positive psychological outcomes and to what extent it is part of a complex pattern of mutually reinforcing variables' (Peele and Brodsky 2000).

In addition, alcohol consumption is positively correlated with violent incidents and negatively with measures of workplace productivity, but there are methodological complications that make it difficult to attribute causality<sup>51</sup> (Gmel and Rehm 2003). Nevertheless, in the case of violent incidents in particular, numerous studies have found a clear and strong link between alcohol consumption (to intoxication) and violence (see, e.g., Room and Rossow 2001).<sup>52</sup> In their review of the harms literature, Meier *et al.* (2008a) find that research published since 2001 is broadly consistent with the findings of the earlier reviews: the stronger findings are not substantially challenged by the subsequent research, and the inconclusive findings are not strengthened by the more recent work.

### 5.2.1 Patterns of drinking

Consumption of alcohol can follow a number of different ‘patterns’, both at an individual level and at a national level, for any given level of aggregate consumption. Individuals vary in the intensity, frequency and setting of consumption: while two people may have the same *total* consumption in a week, one might consume 2 glasses of wine with dinner every day in their own home, while the other might concentrate the same amount of alcohol consumption into a single evening in a public bar and not drink on any other day of the week. These different patterns have different implications for some of the harms associated with alcohol consumption; for example, irregular heavy drinking episodes are associated with greater acute risk of accidents (including traffic accidents) and violent altercations; while moderate drinking may be associated with positive myocardial outcomes,<sup>53</sup> heavy drinking episodes, even for those people who have moderate drinking on aggregate, are associated with negative myocardial outcomes (Rehm *et al.* 2003). Studies in various countries also indicate that drinking on licensed premises is associated with violence (see, e.g., Norström 1998; Stockwell *et al.* 1993); and presumably an evening drinking at home is less likely to lead to a traffic accident than drinking that takes place away from home.

At the aggregate level, there are other possible pattern differences: a country’s total alcohol consumption may be spread across the whole population or dominated by a small number of heavy drinkers, be characterised by daily moderate drinking or weekend binge-drinking, or have consumption patterns that vary along age, gender or social class lines. Differences

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<sup>51</sup> E.g. family background may simultaneously influence propensity to violence and propensity to consume alcohol; stress in the workplace may simultaneously lower work productivity and cause people to consume more alcohol as a coping mechanism.

<sup>52</sup> It is worth citing a peer-review study of the link between alcohol consumption and homicide in fourteen European countries (Rossow 2001). The study consisted of a time-series analysis on differenced series of annual aggregate-level data on alcohol sales and homicide rates for the period 1950–1995, performed for each of fourteen European countries, with estimates pooled across countries within three regions: southern Europe, central Europe and northern Europe. The study supports previous hypothesis that total alcohol sales are positively associated with homicide, especially in the northern European countries where drinking is characterized by heavy drinking episodes (*ibid.*).

<sup>53</sup> This is an ongoing subject of academic debate. There have been a number of studies demonstrating a U-shaped relationship between alcohol consumption and myocardial health, with moderate drinkers having better outcomes than both heavy drinkers and non-drinkers (for a review up to 2001, see Rehm *et al.* 2003). However, a number of papers have also pointed out some methodological difficulties with the abstainer group, as some of the self-selection may be related to ill-health, falsely giving the appearance that the abstention from alcohol was causing poor health outcomes (e.g. Fillmore *et al.* 2006).

in drinking patterns are often used to explain cross-national differences in alcohol-related harm that are not explained by aggregate national consumption. Riskier drinking patterns in the northern European countries (the countries of Scandinavia and the British Isles, where binge-drinking and 'drinking to get drunk' are more prevalent) are contrasted with less risky drinking patterns in the wine-producing southern European countries, and used to explain differences in alcohol-related harms (see, e.g., Hemström *et al.* 2001). Risky drinking patterns in Russia have been used to explain Russia's higher prevalence of alcohol-related harm compared with Poland and the Czech Republic, where consumption is higher but drinking patterns are less risky (Bobak *et al.* 2004).

In any case, it has been estimated that across the EU heavy episodic drinking is a contributing factor to 2000 homicides, 17,000 traffic deaths (which account for one in three of all traffic fatalities), 27,000 accidental deaths, 10,000 suicides, and 16% of all child abuse and neglect (Anderson 2008).

Aside from the volume/frequency variations at the national level, the amount of youth drinking in a country may be a matter of particular interest for policy-makers, for a number of reasons. Young people are responsible for a disproportionate amount of certain alcohol-related harms (most prominently, fatal traffic accidents). In addition alcohol consumption at a young age has a strong effect on future alcohol consumption, magnifying the effects of dangerous consumption by youths with future consequences, and potentially making early intervention particularly cost-effective (Chaloupka *et al.* 2002).

### 5.2.2 The prevention paradox

It is important to note, however, that much recent research has shown that most alcohol-related problems are "attributable to the relatively substantial portion of the population that drinks to intoxication at least occasionally" (Babor *et al.* 2003, p.23). That is, most alcohol-related problems occur among a large majority of drinkers rather than among a small proportion of drinkers. This phenomenon is called 'the prevention paradox', a term coined by N. Kreitman in 1986 that refers to the broad range of alcohol-related problems in the drinking population at large. Research providing evidence of this 'prevention paradox' contradicts an often-held assumption that most of the alcohol-related harms are caused by a small proportion of drinkers.

For example, a recently published peer-review study of Norwegian and Swedish drinking has shown that the majority of acute alcohol problems examined (namely fights and hospital admissions for attempted suicide and violence) were found among the majority of drinkers with low or moderate risk by drinking volume (the bottom 90% of drinkers; Rossow and Romelsjo 2006). This provides support for the 'prevention paradox', although it also indicates that '[t]he extent of the prevention paradox with respect to acute alcohol problems may be more prominent in drinking in subpopulations where intoxication is a common part of the drinking pattern compared with those where intoxication occurs less frequently and among a smaller fraction of the drinkers' (*ibid.*).



### 5.3 **Affordability and harms: previous research**

In this section, we discuss some further nuances of the relationship between alcohol affordability, aggregate and individual consumption, and harms. This builds on the previous discussion of the price/income/affordability-consumption and consumption-harm relationships, but examines more closely the *direct* effect of affordability on harmful and hazardous consumption. It is worth noting, however, that existing research has dealt primarily with the link between *price* of alcohol and alcohol-related harms, rather than with the link between *affordability* and harms. This section draws from the literature on price and harms to gain insights into the affordability-harms association.

For linear dose-response harms associated with alcohol consumption, the effect of affordability on alcohol-related harm should be the simple product of the affordability-consumption effect and the consumption-harm effect. However, for harms that are associated with alcohol in a non-linear way, display threshold effects or are related to the drinking context, it is important to know more about how affordability affects different patterns of alcohol consumption and different types of alcohol consumer.

#### 5.3.1 **Is aggregate consumption data useful in for policy analysis?**

A healthy debate exists in the alcohol harms literature concerning the usefulness of aggregate consumption data. If a particular type of harm is related to a particular drinking behaviour (e.g. heavy drinking), then it may not be enough to know that a policy intervention decreases aggregate consumption – an intervention could (theoretically) decrease aggregate consumption while increasing the harmful drinking behaviour, or increase aggregate consumption while decreasing the harmful behaviour.

One school of thought, defending the use of aggregate-level data, has worked from the basis of Skog's theory of collective drinking behaviour, which asserts that populations 'move in concert up and down the scale of consumption' (Skog 1985; Norström and Skog 2001). If Skog's theory is correct, interventions that reduce the average level of alcohol consumption in a population should lead to a reduction in heavy drinking and other harmful behaviours. However, other researchers dispute the basis of Skog's theory, finding little convincing research in favour of Skog's position and citing contradictory results that cast doubt on the theory's applicability to the real world (Gmel and Rehm 2000). Skog's theory might be 'close enough' if drinking patterns change very slowly over time – Simpura and Karlsson (2001) suggest that the relevant time frame for patterns to change is 'decades or even generations' – but in evaluating the possible effects of changes in alcohol affordability, it is sensible to consider whether people with different patterns of consumption might react differently to the changes. If, for example, changes in affordability are found to have large effects on moderate drinkers and little effect on heavy drinkers, this has different implications for alcohol-related harm, and for policy, compared with a scenario in which changes in affordability have large effects on heavy drinkers and negligible effects on moderate drinkers. For this reason, we examined the literature on micro-level responses of different groups in order to complement our own aggregate-level analysis.

### 5.3.2 Effects of price on harmful and hazardous drinking

A recent review of literature on the link between alcohol tax/price and consumption found that of the twenty-four methodologically robust studies included in the review, most found a clear association between tax/price and alcohol-related harm (Meier *et al.* 2008). These harms include traffic accidents and deaths (particularly among young drinkers), liver cirrhosis, certain types of crimes, violence and domestic abuse (*ibid.*).

Price (or affordability) changes might be expected to affect different types of drinker in different ways. Of particular interest to policy, given the fact that young binge- and heavy drinkers incur a significant proportion of the costs of harmful and hazardous alcohol consumption, is whether heavy drinkers and binge drinkers react in the same way as moderate drinkers. Moderate drinkers might be less addicted to alcohol, and thus be more willing to reduce consumption if price/affordability decreased, but heavy drinkers spend a greater amount of their budget on alcohol and so might be particularly hard hit by any reduction in price/affordability. Young binge drinkers may be motivated by social pressure, decreasing their ability to adapt to price/affordability changes, but if a whole peer-group is affected by this change its effect may be amplified. While individual-level data that can be used to answer these questions are difficult to obtain, some literature has been published that addresses these different effects.

#### Heavy drinking

Wagenaar *et al.* (2008) reviewed ten papers that addressed the response of heavy drinkers to changes in price, of which eight had statistically significant results indicating that heavy drinkers do modify their alcohol consumption when prices change. The mean elasticity across the ten papers was -0.28. While the evidence strongly rejects the hypothesis that heavy drinkers are too addicted to reduce their consumption of alcohol, the effect of price on consumption does appear to be smaller for heavy drinkers than for more moderate drinkers. Reviewing the complete group of papers (not restricted to heavy drinkers) Wagenaar reports the mean elasticity as -0.51, a substantially larger effect. It is possible that measurement error plays a role in the difference: individual-level studies that use local retail prices as proxy for the price paid by the individual may obscure the true effect of price if the proxy is not accurate<sup>54</sup> (Chaloupka *et al.* 2002). Gallet (2007) reports that individual level studies tend to have slightly less elastic price effects (difference: 0.02) which would account for only a small part of the difference between Wagenaar *et al.*'s general estimate and heavy drinker estimate.<sup>55</sup> Wagenaar *et al.*'s estimates also receive

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<sup>54</sup> Some of the studies cited focus on college students, who may consume a significant amount of their alcohol for free at parties (for which bulk purchase prices may not correlate perfectly with local retail prices), or seek out drinks specials at local bars or college bars, whose price information is not accurately gathered by researchers.

<sup>55</sup> There may also be a difference in short-run vs. long-run elasticities pertaining to heavy drinkers, and issues relating to the type of model used to account for addiction. Heavy drinkers may be more addicted than moderate drinkers; as consumption in the next time period is strongly tied to consumption in this time period for addicts, a change in consumption in this period has 'ripple' effects through future consumption, changing the whole trajectory of consumption and making the long-run effect much larger than the short-run effect. Furthermore, models that do not account correctly for the interdependence of past and future consumption may report price effects much smaller than the effects seen in more nuanced models of addiction (see Pacula and Chaloupka 2001)

support from a recent simulation based on British data, which gives comparable values of -0.21 for heavy drinkers and -0.47 for moderate drinkers (Meier *et al.* 2008b).

### Youth drinking

It is difficult to make general statements about youth drinking across the EU due to heterogeneity: youth consumption is much more significant in some countries than in others, and trends in youth consumption also vary between countries. Due to the difficulty of obtaining high-quality data, few studies are able to address the relationship between economic factors and youth drinking and, while youth drinking has been shown to be responsive to price changes, it is unclear whether youth drinkers are more or less affected than the general population.

Youths tend to have smaller budgets and less physical dependence on alcohol than older drinkers, which might be expected to make youths more responsive to price changes in alcohol. Writing in 2001, Pacula and Chaloupka assert that ‘analyses by economists consistently find that the consumption of addictive substances by youths and young adults is more sensitive to changes in price than consumption by adults’. However, the more recent meta-analysis by Gallet (2007) finds that price elasticities for youth drinking tend to be less elastic, on average. Gallet himself speculates that this may be an artefact of the youth beverage of choice: older people tend to consume more wine and spirits than young people do, and wine and spirits tend to have more elastic demand than beer. Studies of youth drinking are also likely to be particularly susceptible to measurement error in the price of alcohol, as young people may consume large amounts of their alcohol for ‘free’ at parties<sup>56</sup>, or at bars offering competitive drinks specials to attract customers (Chaloupka *et al.* 2002). A recent simulation based on British data supported the hypothesis that youth consumption of alcohol is more sensitive to price than consumption by the population at large: the study estimated that a price increase of 10% across all beverages would decrease mean consumption for 11-18 year olds by 5.3%, compared with 4.4% for the general population (Meier *et al.* 2008b).

Much more limited evidence is available on the effect of income changes on youth drinking. Lintonen *et al.* (2000) cite results from their study that used detailed data on ‘pocket money’ for 14-year-old Finnish children over time, which found that increasing pocket money increased alcohol consumption. Similarly, a cross-national study found that family affluence significantly increased the risk of drunkenness among male children in nine out of twenty-eight countries in the study, but only found a significant effect for female children in one country (Richter *et al.* 2006). However, family affluence may be correlated with other factors that affect attitudes towards alcohol, rather than producing a pure income effect, which makes it difficult to determine the effect of income on consumption in cross-sectional studies of this type.

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<sup>56</sup> This is particularly true for 18-20 year-olds in the United States, where most studies of youth drinking take place; in Europe, young people may consume more alcohol from their household, and may thus be similarly somewhat insulated from the effect of price changes.

## 5.4 The link between alcohol consumption and harms in the EU

In this section we report the findings of our data analysis of the relationship between alcohol consumption and harm. The analysis is based on publicly available data from the WHO's Global Information System on Alcohol and Health and European Mortality Database. We include data for the same twenty EU countries (AT, BE, CY, DE, DK, EE, ES, FI, FR, GR, IE, IT, LT, LV, NL, PL, PT, SE, SK, UK) as before. The data spans the years 1996-2003.<sup>57</sup>

Our model (following the same estimation strategy as for estimating the relation between alcohol affordability and consumption) suggest positive, statistically significant associations between alcohol consumption and two indicators of harm: fatal traffic accidents and (non-fatal) traffic injuries. More specifically, we find that a 1% increase in per capita alcohol consumption can be associated with an increase of 0.85% in fatal traffic accidents and 0.61% in traffic injuries.

We also find a positive, statistically significant association between alcohol consumption and the incidence of chronic liver cirrhosis, with a 1% increase in consumption followed by a 0.37% increase in cirrhosis incidences within the same year.<sup>58</sup> We do not find a statistically significant association between alcohol consumption and homicide at the aggregate level.

Whereas the overall fit of our model specifications for fatal traffic accidents and traffic injuries is good, we have less confidence in our models for chronic liver cirrhosis and homicide. We suspect that part of the low overall fit of the liver cirrhosis model stems from the fact that our data does not allow us also to study the long-term effect of changes in alcohol consumption (and not only the short-term effects). More details on this analysis are provided in the following sections.

### 5.4.1 Aggregate data and estimation strategy

In order to obtain a more comprehensive assessment of the impact of population drinking on harm, we have selected a range of harm indicators. More specifically, we looked at fatal traffic accidents and non-fatal traffic injuries – for which there is extensive evidence (as discussed earlier in this chapter) of an association with alcohol consumption. We also looked at instances of chronic liver cirrhosis as a strong indicator of harmful effects of chronic heavy consumption.

Finally, we explored the relationship between alcohol consumption and homicide – which, according to Edwards *et al.* (1994) '[...] can be regarded as extreme expressions of, respectively, self-destructive and aggressive behaviours which are either unrecorded or

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<sup>57</sup> Our data does not allow us to explore the relationship between affordability and harms directly. Instead, we draw on existing literature to discuss the direct link between these two variables.

<sup>58</sup> Although liver cirrhosis is typically associated with alcohol consumption over a long period of time, it is possible to find an association between alcohol consumption and liver cirrhosis within shorter time frames. At the beginning of a given year, there are individuals who are near the critical threshold value for chronic liver cirrhosis due to a long career of excessive drinking. If the consumption of these people increases during the year (which will be reflected in per capita consumption), the rate of liver cirrhosis that year will increase by more than if the consumption of alcohol had remained fixed.

poorly recorded, and thus not amendable to statistical analyses, but which are nevertheless likely to be influenced by drinking’.

The question we are exploring in this section is to what extent changes in overall alcohol consumption have an effect on harm rates. It is important to note that, even though closely related, this is a different question from whether alcohol consumption affects an *individual’s* harm risk. The main reason is that changes in harm rates depend not only on changes in individual risk (when consumption increases) but also on whether and to what extent heavy drinking increases when per capita consumption increases.

To the extent that we do find such a positive association, one important contribution of this study is that it allows triangulating evidence on the relationship between alcohol consumption and harm. Norström and Skog (2001) make the point that a relationship that is corroborated by various kinds of data, analysed by different methods, is more credible than a relationship that has been replicated several times, but by one method only.

In terms of estimation strategy we follow the same approach (for the same reasons) as before. That is, we estimate the relationship of alcohol consumption and harm in first differences rather than absolute levels. Letting  $\Delta$  denote the differencing operator our base equation becomes:

$$\Delta Harm_{it} = \beta_1 \Delta Consumption_{it} + \beta_2 \Delta Control_{it} + \Delta \varepsilon_{it} \quad (5)$$

(where  $Harm_{it}$  and  $Consumption_{it}$  refer to harm and consumption in country  $i$  at time  $t$ .  $\varepsilon_{it}$  represents the corresponding error term, or noise).

This modelling approach has a similar set of advantages to those discussed earlier – both in a statistical sense (in terms of stationarity) and an epistemological sense (in the sense of being non-ad-hoc). In addition, estimating the relationship between alcohol consumption and harm in first differences provides the advantage of eliminating cross-country, time-invariant effects.

To account for common time effects (across all countries) we include a full set of time dummies in our model. We estimate equation 5, as before, in natural logarithms (log-differences). This allows us to interpret the coefficients ( $\beta$  s) as elasticities.<sup>59</sup> That is, the coefficients give the associated response (in percentage terms) in harm to a 1% change in overall consumption.

#### 5.4.2 Data

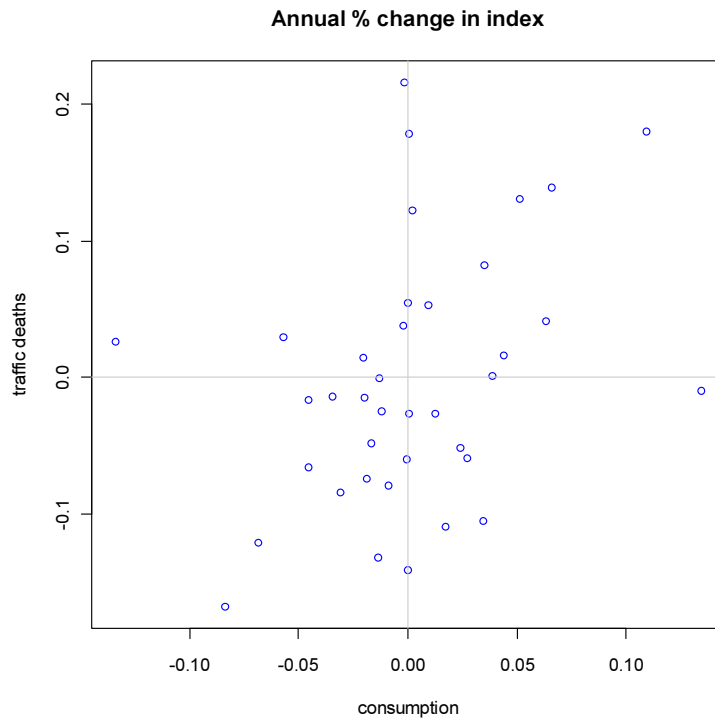
Our analysis is based on publicly available data. Consumption data are drawn from the WHO’s Global Information System on Alcohol and Health. The harm data are from the WHO’s European Mortality Database. The data on fatal traffic accidents, non-fatal traffic

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<sup>59</sup> It is worthwhile bearing in mind that while taking the natural logs makes it easy to interpret coefficients as elasticities, it imposes a functional form – i.e. constant elasticity of demand.

accidents and liver cirrhosis comprises both alcohol related cases and non-alcohol related cases.<sup>60</sup>

As explained above, we calculated the consumption index and harm indices for twenty EU countries (AT, BE, CY, DE, DK, EE, ES, FI, FR, GR, IE, IT, LT, LV, NL, PL, PT, SE, SK, UK) for the years 1996-2003 – and set them equal to 100 in 1996 for all countries.



**Figure 5-2: Annual change in consumption and traffic deaths**

As an illustration, the figure above shows the annual changes in the consumption index (horizontal axis) and fatal traffic accidents (vertical axis).

### 5.4.3 Results

The table below shows the estimated parameters of this regression model, together with the corresponding (robust)<sup>61</sup> standard errors. We find a positive, statistically significant relationship between alcohol consumption and fatal traffic accidents. More specifically, we find that a 1% increase in alcohol consumption can be associated with a 0.85% increase in fatal traffic accidents.

<sup>60</sup> We do not have (suitable) data on alcohol-related harms. An advantage of including (also) non-alcohol related traffic accidents and deaths is that it includes traffic accidents that were not specifically attributed to drunk drivers, but may none the less have been caused by them.

<sup>61</sup> In regression with robust standard errors the estimates of the regression coefficients are the same as in the standard OLS linear regression but the estimates of the standard errors are more robust to failure to meet assumptions concerning normality and homogeneity of variance of the residuals.

In order to control for the possibility that changes in traffic density could bias our result (whereby increases in overall consumption go hand in hand with increases in traffic density), we include a ‘density variable’ (measuring the volume of passenger transport) in our model. We do not find a statistically significant effect for traffic density with regard to fatal car accidents.

**Table 5-1: Estimation results harms 1/2**

	Traffic deaths			Traffic injuries		
	Coefficient	Robust SE	Sign.	Coefficient	Robust SE	Sign.
Consumption	0.855	0.3049889	***	0.610	0.291	**
Traffic Density	-0.143	0.415844		1.525	0.694	**
Time dummy 1997						
Time dummy 1998						
Time dummy 1999						
Time dummy 2000	-0.033	0.014	**	-0.035	0.017	**
Time dummy 2001	-0.036	0.016	**	-0.027	0.017	
Time dummy 2002	-0.049	0.012	***	-0.017	0.017	
Adj R squared	0.46			0.24		
N	112			112		

Notes: \*\*\* means statistically significant at the 1% level, \*\* at the 5% level and \* at the 10% level.

We find a positive association between alcohol consumption and (non-fatal) traffic injuries. A 1% increase in consumption in our model comes with a 0.61% increase in traffic injuries. We control for traffic density again and find a statistically significant effect.

Whereas the overall fit of the two models (looking at fatal traffic injuries and traffic injuries) – with Adj R squares of 0.46 and 0.24 – is good, we have slightly less confidence in the two models looking at the effects of liver cirrhosis and homicide (both with Adj. R squares below 0.1).

In case of chronic liver cirrhosis we do find a statistically significant positive association between alcohol consumption and the incidence of liver cirrhosis, with a 1% increase in consumption followed by a 0.39% increase in cirrhosis incidences within one year of change.

The reason for the low fit of our model is likely to be associated with the fact that our data allow us to take into account only the short-term response of liver cirrhosis incidences to changes in alcohol consumption, while clinical evidence indicates that there is also a long-term effect due to the considerable latency period for liver cirrhosis of 15-20 years (Sheron *et al.* 2008).

The short-term response we find can be best explained by means of a water reservoir analogy. At the beginning of a given year, there exists a reservoir of individuals who are near the critical threshold value for chronic liver cirrhosis due to a long career of excessive drinking. If the consumption of these people increases during the year (which will be reflected in per capita consumption), more people will exceed the threshold value than if the consumption had remained fixed.

**Table 5-2: Estimation results harms 2/2**

	Cirrhosis			Homicide		
	Coefficient	Robust SE	Sign.	Coefficient	Robust SE	Sign.
Consumption	0.397	0.208	*	-0.369	0.356	
Time dummy 1997	0.045	0.029		-0.046	0.039	
Time dummy 1998	-0.026	0.018		0.000	0.032	
Time dummy 1999	-0.024	0.023		-0.035	0.037	
Time dummy 2000	0.020	0.022		-0.066	0.059	
Time dummy 2001	-0.041	0.015	***	-0.028	0.039	
Time dummy 2002	-0.015	0.023		-0.041	0.048	
Adj R squared	0.08			0.05		
N	121			121		

Note: \*\*\* means statistically significant at the 1% level, \*\* at the 5% level and \* at the 10% level.

We do not find a positive statistically significant association between homicide and alcohol consumption. Still, in the absence of controls for other possible causal factors influencing homicide, the fit of our model for this outcome is too low to draw any inferences from this finding.



#### 5.4.4 Limitations

As with our discussion of affordability and consumption, it is possible that our results on the association between consumption and harms hide important differences between countries and/or over time. Unfortunately, our data do not allow us to estimate this association for each country or for different time periods separately. The results presented here only provide an average on the association drawn from data from across the EU.

We do not have data on alcohol-related harms specifically; rather, we use data on harm indicators for which there is strong evidence of an association with alcohol consumption. This increases the set of possible explanations for these harms. It is beyond the scope of this report to control for all other variables. We therefore cannot exclude problems of omitted variable bias (i.e. distortions of our estimated coefficients).

At the same time, it is important to note that the omission of (other) drivers is a necessary, but not sufficient condition for omitted variable bias. Only to the extent that the omitted variables are (also) correlated with the (included) explanatory variable, do we expect to encounter biased results.

#### 5.5 Closing remarks

Our findings support those of existing research on the link between alcohol consumption and certain types of harms. We find a statistically significant association between alcohol consumption and the incidence of traffic deaths, traffic injuries and liver cirrhosis. As discussed in this chapter, there is substantial and robust evidence of this association, to which our own analysis contributes.

This evidence, in combination with the existing body of research on the link between alcohol price/income/affordability and consumption, and on the direct link between alcohol price/income and harms, provides strong support for the use of alcohol pricing policies as a potentially effective measure to curb hazardous and harmful drinking in Europe.



## CHAPTER 6 **Cross-border alcohol consumption in the EU: three case studies**

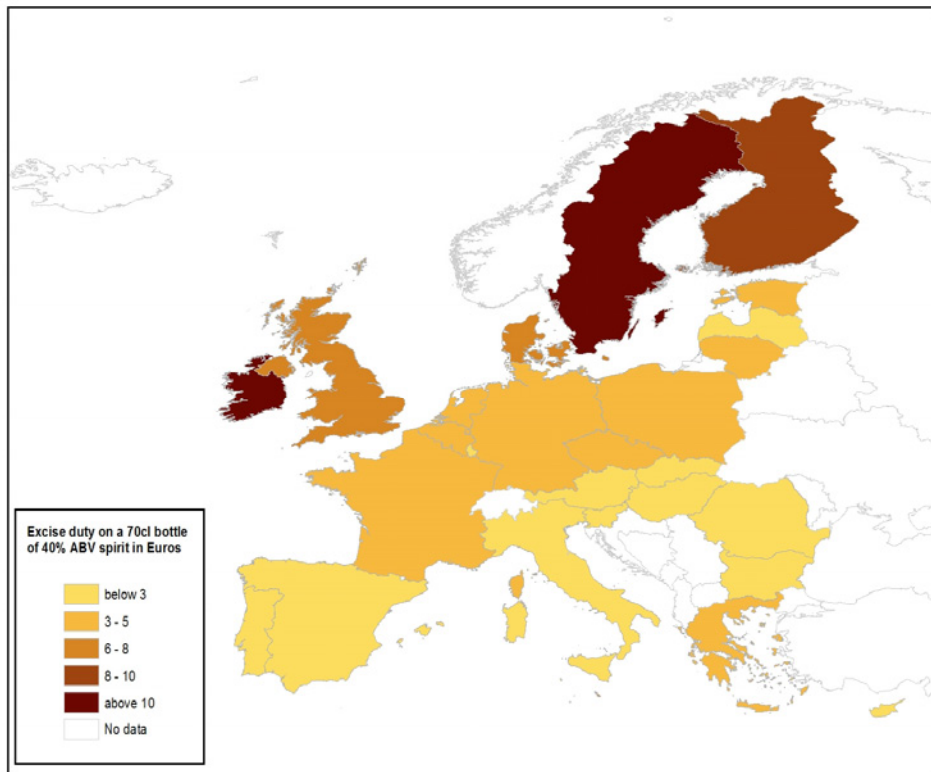
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In the integrated single European market the analysis of affordability of alcoholic beverages in a single MS provides only an incomplete picture, as people are able to, and often do, take advantage of lower alcohol prices in neighbouring countries. In this chapter we present the findings from three case studies on cross-border purchasing of alcohol, namely: Sweden-Germany-Denmark, Finland-Estonia and UK-France.

### 6.1 **Cross border purchase of alcoholic beverages**

The three case studies examined in this chapter were selected for two main reasons. First, there is a significant difference in the alcohol excise duty rates of the neighbouring countries in each case study. As an illustration of the differences in the excise duty rates for alcohol in the countries examined here, Figure 6-1 below shows the excise duty on a 70cl bottle of 40% ABV spirit in Euros across the twenty-seven Member States. These significant differences in taxation are, in the countries examined here, reflected in differences in the retail price of alcohol (especially in the off-trade).

Second, there is an existing body of literature and data on cross-border alcohol consumption for each of the case studies. The second point was crucial as the collection of primary data was not within the scope of this research. These reasons also determined that the three case studies examined here are of countries sharing sea rather than land borders; as we mention later in this chapter, research on cross-border alcohol consumption between countries sharing land borders could yield different results to what is presented here.



**Figure 6-1: Excise duty on a 70cl bottle of 40% ABV spirit in Euros**

As the Figure above shows, most of the high-taxation countries can be found in northern Europe and in particular in Scandinavia, which somewhat limits the geographical spread of the possible case studies. To get a certain variation nevertheless, we included along side the Scandinavian countries (Sweden, Finland, Denmark), a new MS (Estonia), as well as a western European example. The three selected case studies in cross-border purchase of alcoholic beverages are:

1. Sweden, Denmark and Germany;
2. Finland and Estonia;
3. United Kingdom and France.

For each combination of countries, current cross-border sales volumes and trends are analysed, regulation on limits in cross-border purchase is presented and evidence of the consumption in the countries with higher taxation is presented.

In analysing these cases, the following general limitations apply. First, our analysis will very much focus on the 'importing' rather than the 'exporting' country, as we are primarily interested in the impact of cross-border purchase on the alcohol market of the high price/high-taxation country. Thus we are leaving aside questions such as problems with

binge drinking in border towns and so on. Second, we are only concerned with a specific type of cross-border purchasing, namely the legal import of alcoholic beverages for own, personal use and, to a lesser extent, small-scale smuggling, consisting of legal purchase in the country with lower prices and illegal reselling in the country with higher prices (see e.g. SOU, 2004). Finally, it is worth noting that all the cases studied involve sea borders, which might in general have a lower degree of cross-border purchasing, as travelling across sea borders often requires more effort and involves higher expenses.<sup>62</sup>

## 6.2 Sweden, Denmark and Germany

This first case study concentrates on cross-border purchasing of alcohol in Sweden, with the two main source countries Denmark and Germany.<sup>63</sup> However, Denmark both generates cross-border purchasing (to Germany), and attracts cross-border shopping (from Sweden). Although Denmark and Sweden do not share a land border, traffic connections between the two countries are good, the metropolitan regions of Copenhagen and Malmö are linked through road and railway across Öresund bridge and additional ferry services link the two countries. Germany and Sweden are linked through various ferry services from north-east Germany across the Baltic to south Sweden. Finally, Denmark and Germany share a land border and are connected through frequent ferry services across the Fehmarn Belt.

### 6.2.1 Alcohol political context

Sweden is a country with a very long tradition of having a distinct, strict alcohol policy, with the roots of a restrictive alcohol policy going as far aback as into the middle of the 19<sup>th</sup> century and running throughout the 20<sup>th</sup> century Sweden always had one of the strictest alcohol policies in the Europe (Holder *et al.* 2008).

Prior to the joining the EU in Sweden's alcohol policy was still very much defined by the alcohol law of 1977 (*Alkohollagen*). Back then, the alcohol policy had been revised and put on a strong public health footing by moving responsibilities from the ministry of finance to the ministry of health and social affairs. From then, Swedish alcohol policy was based on three main pillars:

1. limiting the private profit motive, by creating a production and wholesale monopoly as well as an off-trade retail monopoly;

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<sup>62</sup> Cross-border purchases of alcoholic beverages over the internet are also an interesting phenomenon within the EU, although there is little research on this. While an examination of this is outside the scope of the present study, it is worth noting that, unlike the situation with cross-border shopping by travellers, internet purchases of alcohol and other excise products are subject to excise duties (and VAT) *in the Member State where the purchaser received their goods*, with the obligation to pay excise duties in the MS of the purchaser resting upon the vendor (see: European Commission Taxation and Customs Union, available at: [http://ec.europa.eu/taxation\\_customs/common/travellers/within\\_eu/faq\\_1179\\_en.htm#17](http://ec.europa.eu/taxation_customs/common/travellers/within_eu/faq_1179_en.htm#17), accessed January 2008).

<sup>63</sup> For a wider and more detailed discussion of cross border purchasing of alcoholic beverages in the Nordic countries see Karlsson and Österberg (forthcoming).

2. strict control of the physical availability of alcohol, through the alcohol retail monopoly with restricted opening hours (e.g. no Saturday opening) and by banning the selling of light beers in super markets as well as a high legal drinking age;
3. increasing the price of alcohol through high taxes – the taxes were progressive within each drink category strictly taxing for content of pure alcohol.

After joining the EU in 1995, these arrangements had to be changed to comply with European rules. First, the production and wholesale monopoly of the state enterprise Vin & Sprit AB was abolished. Then, after a period of working on a purely commercial basis, the company was finally sold to Pernod Ricard's for €5.69 billion in 2008.<sup>64</sup> The off-trade retail monopoly by Systembolaget could however be retained, although the opening hours have seen a liberalisation recently and the shops have been transformed from counter stores to modern self-service stores.

Second, the previous progressive calculation of alcohol taxes within a drink category had to be brought in line with European regulations, which are based on fixed tax rates for specific product categories. As the Swedish government aimed to maintain the revenues from alcohol taxes, this effectively led to a reduction of taxes for beverages with higher alcohol levels, and an increase for beverages with lower alcohol levels within a product category.

Finally, Sweden had initially secured a temporary derogation on a lower traveller allowance for the private import of alcoholic beverages, which was twice renegotiated in 1996 and 2000, but by 2003 Sweden had to phase out allowances and follow European practice of unlimited travellers import of alcohol for personal use.<sup>65</sup>

The opening of the borders to the neighbouring lower-tax countries Germany and Denmark led however to further pressures on the tax rates in Sweden. In particular as Denmark had witnessed a series of tax cuts, with the taxes on beer and wine cut by half in 1991-1992 and the tax for distilled spirits cut by 45 per cent in 2003.

After the replacement of travellers' quotas with indicative levels for personal use had led to a marked increase in the cross-border purchase of beer, the taxes for strong beer were reduced by 39% resulting in a price drop of around 20%. This in turn led to pressures in 2001 to also reduce the tax on wines also, as the EC held that the low taxes for (domestically produced) beer as compared to (imported) wine constituted discrimination against foreign producers (Holder *et al.* 2008).

### 6.2.2 Alcohol taxation and prices

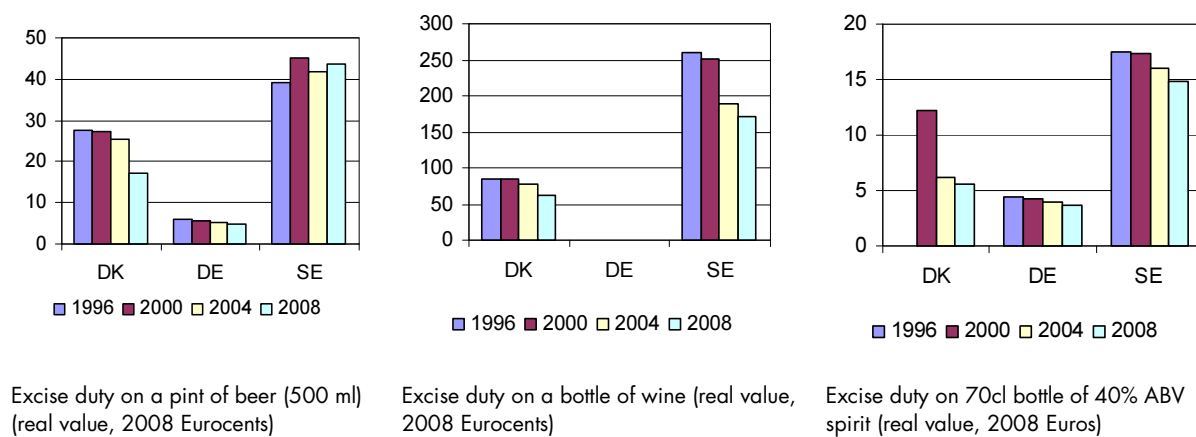
A look at the level and trends in the real value of excise duty for different alcoholic beverages in Denmark, Germany and Sweden (figure 6-2) allows several observations to be made:

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<sup>64</sup> See Pernod Ricard's press release of 28 July 2008.

<sup>65</sup> However, working with guidance what levels of alcohol imports can still be considered for personal use.

1. There is a downward trend in the real value of taxes for all beverages in all countries, except for beer in Sweden, which has increased since the reductions in the mid-1990s.
2. The differences in excise duty rates between the countries are very substantial. There is, for example, no excise duty on wine in Germany, while consumers have to pay €1.70 in excise duty for a bottle of wine in Sweden. Similarly, the duty on beer is nearly ten times as high in Sweden (€0.43 per 500ml), as in Germany (€0.04). Denmark has a position somewhere in between. The same holds true for spirits. Cross-border purchasers pay around €11 less in excise duty for a bottle of spirit in Germany than in Sweden.
3. These differences are exacerbated by the different VAT rates in the three countries. Both Denmark and Sweden currently charge 25% VAT on alcoholic beverages, while the German VAT rate is currently 19%.



SOURCE: DG TAXUD (2008)

**Figure 6-2: Levels and trends in excise duties (real value, 2008 Eurocents)**

Given the high level of excise duties and VAT in the two Nordic countries, taxes constitute a very substantial element of the final price. Despite price data being notoriously patchy, a study from 1999 breaks down the final retail price into its main components for the five Nordic countries. Figure 6-3 below shows that in Denmark, Sweden and Finland, taxes constitute the most important factor influencing the price of spirits. In 1999, 71% of the average retail price of a 0.7 l bottle of spirits was due to taxes in Sweden, 57% in Denmark and 65% in Finland. The least taxed alcoholic beverage in all three countries was wine (Horverak and Österberg 2002).



SOURCE: Horverak and Österberg (2002)

**Figure 6-3: Taxes and duties as share of the final retail price of alcoholic beverages, Denmark, Sweden, Finland in 1999**

### 6.2.3 Regulations: limits of volumes to be transported

Since Sweden fully harmonised their legislation with the EU requirements, traveller allowances have been abolished. Since 2004 travellers from Germany, Denmark and other EU countries are allowed to import as much alcohol as they like for personal use from abroad. There remains, however, guidance on which amounts of alcohol can still be considered for personal use (and which are thus not subject to the destinations tax rules). Table 6.1 provides an overview of how traveller allowances were adapted in steps to meet the European standard between 1995 and 2004.

**Table 6.1: Traveller allowances in Sweden**

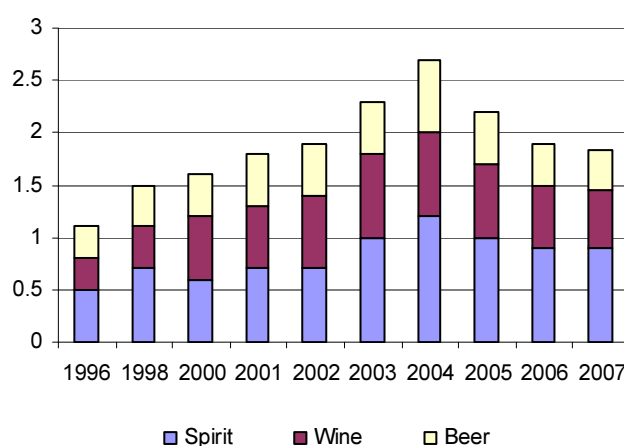
Period	Spirit (l)	Fortified wine (l)	Wine (l)	Beer (l)
1 January 1995	1l of spirits or 3l of fortified wine		5	15
1 July 2000	1	3	20	24
1 January 2001	1	6	26	32
1 January 2002	2	6	26	32
1 January 2003	5	6	52	64
1 January 2004	Free, definition of personal use: 10	Free, definition of personal use: 20	Free, definition of personal use: 90	Free, definition of personal use: 110

Source: SOU 2004

### 6.2.4 Cross-border sales volume

The Swedish Centre for Social Research on Alcohol and Drugs (SoRAD) monitors alcohol consumption as well as alcohol imports for personal use and smuggling in Sweden. Figure 6-4 shows recent trends in the cross-border purchasing of alcoholic beverages in Sweden. These follow closely the increase in travellers' allowances, but trail off after 2004.





Source: Boman et al. (2007)

**Figure 6-4: Cross-border purchase of alcohol by beverage type in litres of pure alcohol per inhabitant, 1996-2006**

After 1996 the volume of cross-border purchasing as measured in litres of pure alcohol per inhabitant had more than doubled by 2004; then there was a slight decrease to a level that in 2007 (last year with data) was still around 70% higher than it was in 1996. This equalled a total cross-border purchase of 18.3 million litres of spirit, 30.7 million litres of wine and 58.1 million litres of beer in 2006.

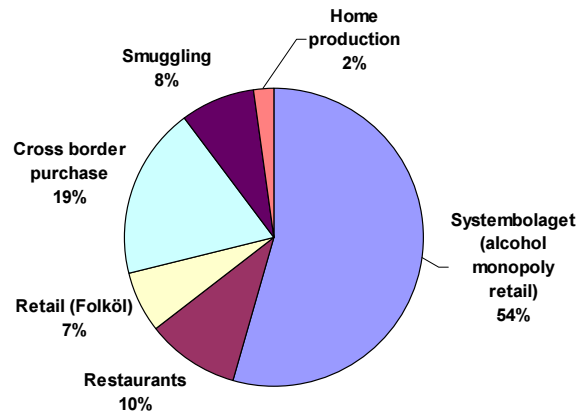
As expected, the main sources of imported alcoholic beverages in Sweden were Germany and Denmark in 2006 (Table 6.2), with almost half the beer and wine and almost a third of the spirits originating in Germany. This is somewhat surprising as it is more convenient to travel to Denmark than it is to travel to Germany.

**Table 6.2: Country of origin for alcoholic beverages purchased abroad in 2006 (in% of total cross-border purchasing)**

Country	Pure alcohol	Spirits	Wine	Beer
Germany	41	31	49	51
Denmark	21	15	26	26
Finland	6	8	3	6
Other EU	23	32	16	14
Outside EU	9	14	5	3

Source: Boman et al. (2007)

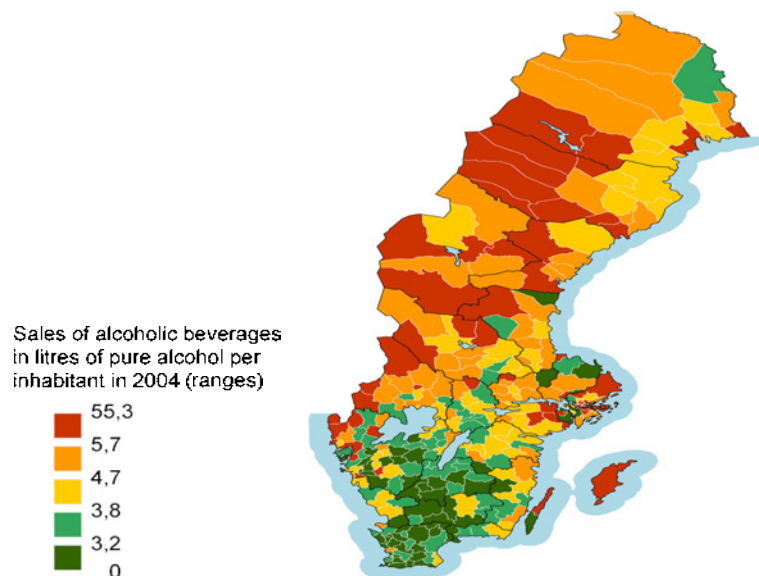
A look at the total amount of alcohol consumed in Sweden demonstrates that cross-border purchasing contributes a very substantial amount of overall alcohol consumption. In 2007, cross-border purchases of alcoholic beverages were the source of almost a fifth of all alcohol consumption in Sweden.



Source: SoRAD (2008)

**Figure 6-5: Sources of alcohol consumption in Sweden (2007)**

Data both on sales from the local alcohol monopoly stores Systembolaget as well as the sources of alcohol consumption show strong regional variations in sales and the share of alcohol purchased abroad. Systembolaget report the lowest sales in southern Sweden, while at the same time consumption from cross-border purchasing is strongest there (SoRAD 2007). Figure 6-6 also shows higher sales in the border regions to Norway, where alcohol taxes are even higher than in Sweden.



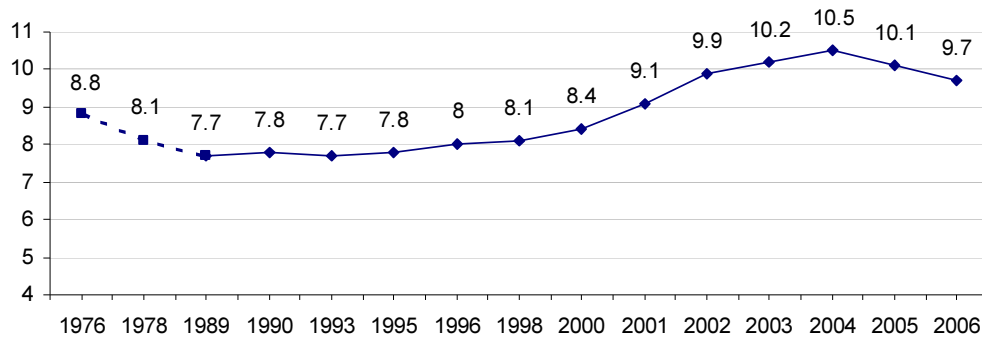
SOURCE: FHI (2008)

**Figure 6-6: Sales of alcohol in litres of pure alcohol in state monopoly stores per inhabitant in 2004, Sweden<sup>66</sup>**

<sup>66</sup> In each range there is the same number of 58 local authorities. The very value of 55.3 litres of pure alcohol per person is due to the very high sales in the Strömstad region, bordering to Southern Norway.

### 6.2.5 Consequences for consumption and harms

Total alcohol consumption (recorded and unrecorded) in Sweden has risen over the last decades from 1989 until 2004; from then until 2007 there was a slight drop in consumption to the estimated 9.7 litres of pure alcohol per person aged 15 or older (Boman *et al.* 2007).



Source: Boman *et al.* 2007; data for 1976 and 1978. SOU (2004)

**Figure 6-7: Total alcohol consumption in litres of pure alcohol per population above 15**

Comparing the overall consumption trends in Figure 6-7 with the consumption of alcohol purchased abroad shown in Figure 6-4, a very similar pattern can be observed. Alcohol consumption peaked in 2004 and decreased slightly since then.

Within Sweden there are however regional differences in the level of alcohol consumption. These differences widened during the 1990s but levelled off somewhat since 2004. Starting from a slightly below average consumption, the southern Swedish counties, in particular Skåne considerably increased their alcohol consumption until around 2003, while the northern counties experienced only a slight increase (SOU 2004). Both the increase until 2004 and the subsequent slump in consumption in the southern counties in 2005 were largely driven by the cross-border purchase (and smuggling) of alcohol from Denmark and Germany (Boman *et al.* 2007).

As part of its review of cross border purchasing of alcohol in 2005, the Swedish government commission on alcohol imports (*Alkoholinförselutredningen*), commissioned an analysis into regional differences in the development of alcohol-related morbidity and mortality. In this study the southern Swedish counties showed an increase in alcohol-related deaths in the period from 1987 to 2002. This trend started, however, before the EU membership and it is therefore more difficult to relate those observations to the changes in the legal framework. The negative changes observed in southern Sweden since EU membership were however slightly higher than what would have been expected if the negative trend from 1987 to 1992 had simply continued. This points towards the increased consumption of imported alcoholic beverages as one driver of increased morbidity and mortality (SOU 2005). The government commission on alcohol imports expressed its concern about several indicators of alcohol-related harms increasing in the 1990s and into the 2000s in parallel to the increase in overall consumption – however, with the alcohol-related mortality being rather stable (SOU 2005).

In another recent study the relationship between alcohol related harms and alcohol purchased abroad is addressed more explicitly. This study, entitled in translation ‘Is Denmark a Swedish health risk?’ shows that (for 2003) costs for alcohol-related in-patient treatment in Skåne county varied with the distance to the Danish border. The closer a hospital to the Danish border, the higher the costs for alcohol related diagnosis were for in-patient treatment (Jarl *et al.* 2007).

#### 6.2.6 Implications

This short case study of cross-border purchasing between Sweden, and Denmark and Germany allows some interesting observation to be made.

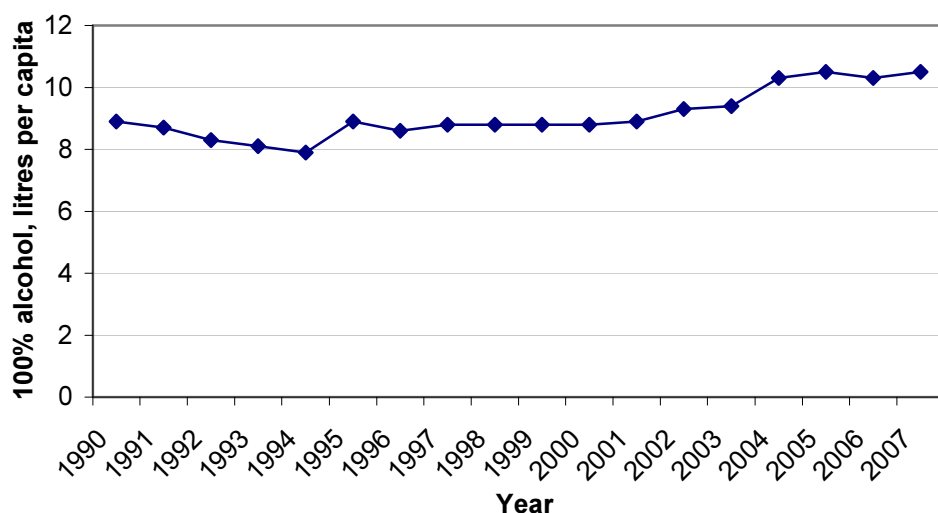
First, tax differentials between neighbouring countries do have a substantial effect on the purchasing behaviour for alcoholic beverages. A recent, more systematic analysis of the cross-border purchasing between Sweden and Denmark showed, for example, that sales at state monopoly shops several hundred kilometres away from the border were responsive to price changes in Denmark (Asplund *et al.* 2007).

Second, alcohol purchased abroad constitutes a very substantial part of the total alcohol consumption in Sweden, and may be suspected to be one of the drivers of the increase in alcohol consumption until around 2004. However, we see also a drop in the sales after 2004, which may suggest that many shoppers might have tried out the new liberal rules in the first year of liberalisation, but did not adjust their more long-term purchasing patterns.

Third, there is no pattern clearly emerging yet on the impacts that cross-border purchasing have on alcohol related harms in the border regions. Southern Sweden experienced a disproportionate increase in alcohol consumption until 2004, and there is some, still preliminary, evidence that this led to an increase in related harms.

### 6.3 Finland and Estonia

The case of Finland and Estonia offers additional interesting insights into the effects of travellers’ cross-border alcohol imports for personal use. Unlike many other European countries, but like its Scandinavian counterparts, alcohol consumption in Finland has increased over the last decades, with the early 1990s seeing a temporary fall in consumption in the context of an economic recession in the country (Finish Ministry of Social Affairs and Health 2006). The figure below shows this trend. Over this time period, research shows that harms attributable to alcohol – such as traffic accidents, violence and deaths due to alcohol-related diseases and alcohol poisoning – have increased, and that the association between changes in consumption and changes in harms is strong (*ibid*; Mäkelä and Österberg 2009). In fact, one study suggests that for the period 1980-1990, alcohol harms such as alcohol-related diseases and alcohol-related damages due to offences grew even faster than alcohol consumption, as did alcohol-related social welfare (Salooma 1995).

**Figure 6-8: Total consumption of alcoholic beverages, 100% alcohol per capita, Finland 1990-2007**

Source: National Institute of Health and Welfare, Finland

Since the 1930s Finland had developed a comprehensive alcohol control policy that aimed to reduce the level of alcohol harms (Karlsson and Österberg 2002). Until 1995, alcohol policy in Finland was based on three main pillars:

- The commerce of alcoholic sales was ‘disinterested’ (i.e. private profits from alcohol sales and production were minimised) – this was achieved through the Finnish state’s monopoly (Finnish State Alcohol – Alko) on the rights to produce, import, export, wholesale and retail alcohol products; Alko had the right to set on- and off-trade alcohol prices until 1995;<sup>67</sup>
- The physical availability of alcohol was strongly restricted – the alcohol retail monopoly was a key instrument in the achievement of this aim, and;
- The economic availability of alcohol was regulated through high taxes and prices, which were higher than those of most other European countries.

However, as early as the 1960s, Finland began a gradual process of liberalisation of its alcohol policy, which continued over the following decades. In the early 1990s, Finland substantially revised its alcohol policy as required by the country’s participation in the European Economic Area (EEA) agreement and membership of the EU. For example, after the Alcohol Act of 1994, Finland only retained a monopoly on off-trade alcohol retailing and alleviated bans on alcohol advertising for beverages below 22% ethyl alcohol by

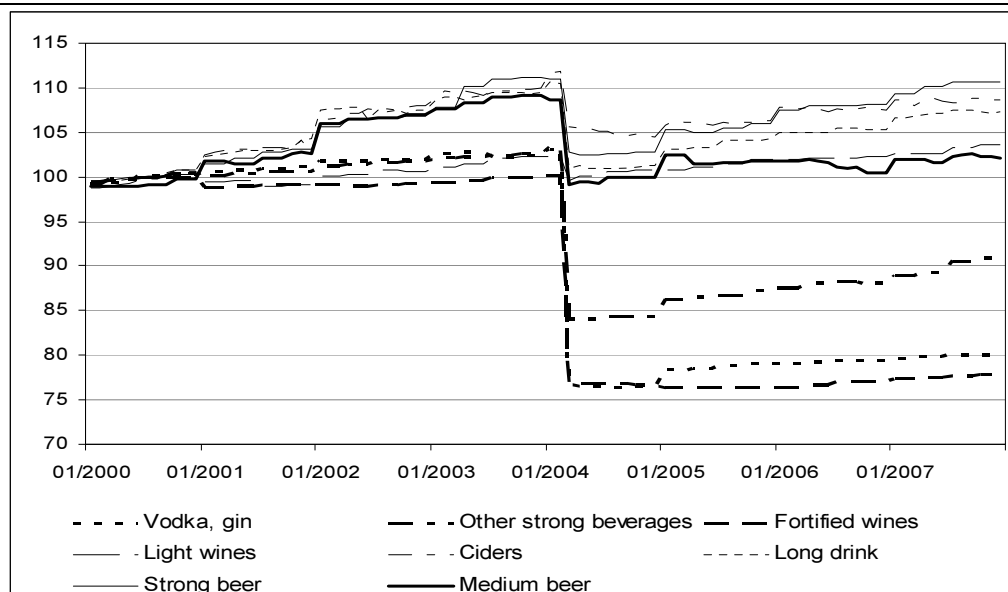
<sup>67</sup> Some deviations occurred in the system, for example Alko was allowed to entrust the on-trade sale of alcoholic beverages to private business, such as restaurants and bars. The brewing of beer was entrusted to private breweries, and medium-strength beer was also sold in ordinary grocery stores after 1968 (Alavaikko and Österberg 2000; Karlsson and Österberg 2003. See also: Tigerstedt *et al.* 2006).

volume, although – in spite of pressure from various quarters within the country – there was no significant reduction on alcohol excise duties at that time (Alavaikko and Österberg 2000). A further change was the abandonment of time limits on travellers' tax free alcohol allowances on 15 February 1995. Until then, travellers returning to Finland could bring alcohol free of tax into the country only if they had stayed away for twenty-four hours or more – time limits were reintroduced in May 1996 for travel between Finland and non-EU countries (Karlsson and Österberg 2003).

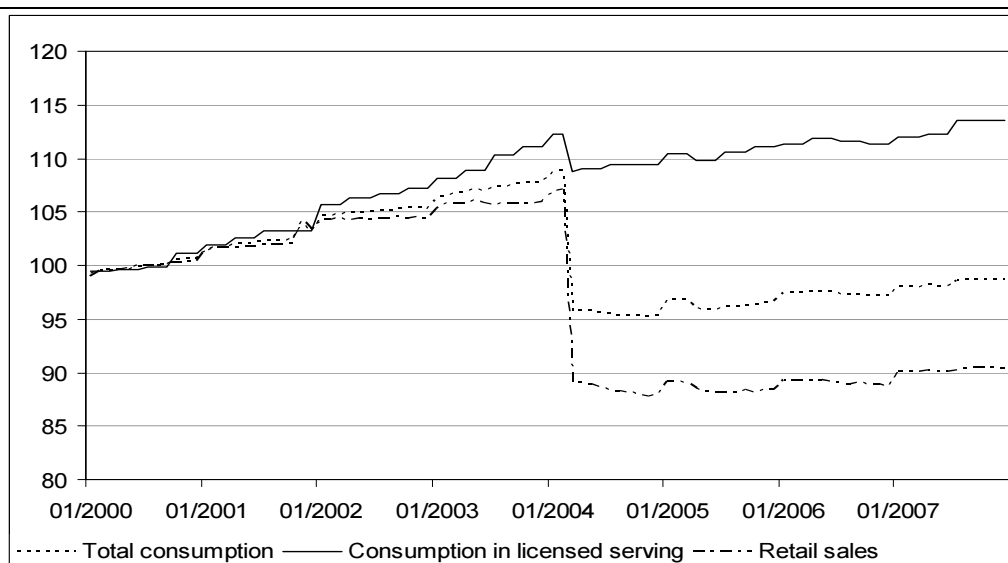
#### 6.3.1 Changes since 2004

In May 2004, Estonia, a traditionally low tax country for alcoholic beverages, became an EU member. From that date, intra-EU regulations on cross-border purchases of alcoholic beverages came into effect for travellers between the two countries (Mäkelä *et al.* 2007; Mäkelä & Österberg 2009). With Tallinn only two hours away by ferry from Helsinki, and its significantly lower alcohol taxation and prices, it was expected that cross-border consumption of alcohol would increase in Finland, which would entail a significant loss of the alcohol tax base for the country. There were also concerns that a black market and a grey economy on mass imports by intermediate third parties could be established following the 2004 changes (Koski *et al.* 2007). None of these had been concerns before, when Finland's closest EU neighbours were Sweden and Denmark, also high-taxation countries. All these factors together were predicted to lead to an increase in aggregate alcohol consumption in Finland.

As a response to this, Finland implemented a significant reduction in its alcohol excise duty rates ahead of the accession of Estonia to the EU in March 2004; taxes on spirits were lowered by 44%, on fortified wine by 40%, on table wine by 10% and on beer by 32% – an average of 33% for all alcoholic beverages (Mäkelä 2007). The prices of alcohol in government-owned stores also experienced a sharp reduction: spirits by 28-36%, fortified wine by 25%, wine by 3% and beer by 13% (*ibid.*; Mäkelä and Österberg 2009). The figures below provide an overview of the price changes experienced in Finland from 2000 to 2007 by type of beverage and by type of venue (off- and on-trade).

**Figure 6-9: Nominal price indexes by type of beverage, Finland 2000-2007**

Source: National Institute of Health and Welfare, Finland.

**Figure 6-10: Nominal price indexes for licensed serving and retail sales of alcoholic beverages, 2000-2007**

Source: National Institute of Health and Welfare, Finland.

### 6.3.2 Effects of Estonia's EU accession and decreases in Finland's alcohol taxation and prices

#### Consumption

Even before the developments outlined above took place, policy and academic interest in their effects was mounting (see, e.g., Mäkelä 2002). In particular, government, public

health and other stakeholders were concerned with the question of to what extent the 2004 changes would affect alcohol consumption (in particular cross-border consumption) and alcohol-related harms.

Research following the 2004 changes was conducted to provide answers to these questions. It was estimated that overall alcohol consumption increased by 10% following the abolition of traveller tax-free import quotas from other EU countries, the reduction of alcohol taxes in Finland and the accession of Estonia to the EU. Recorded consumption increased by 6,5% and unrecorded consumption was estimated to have increased by about one-fourth (Mäkelä and Österberg 2009).<sup>68</sup> Recorded consumption, which was on a slow but steady increase since the mid 1990s and had hit a record high of 9 litres of pure alcohol per capita in 2001, reached 10.5 litres in 2005 (Mäkelä and Österberg 2009). Unrecorded consumption of alcohol consists of alcohol brought into the country by tourists for personal consumption, alcohol consumed abroad, alcohol produced illicitly, smuggled alcohol and beer and wine produced legally in private homes. While unrecorded consumption was around 15% before Finland's accession into the EU, estimates suggest that it increased after 1995, and particularly in 2004, mostly driven by increases in the amounts of alcohol imported by travellers from Estonia and from Russia (Finnish Ministry of Social Affairs and Health 2006).

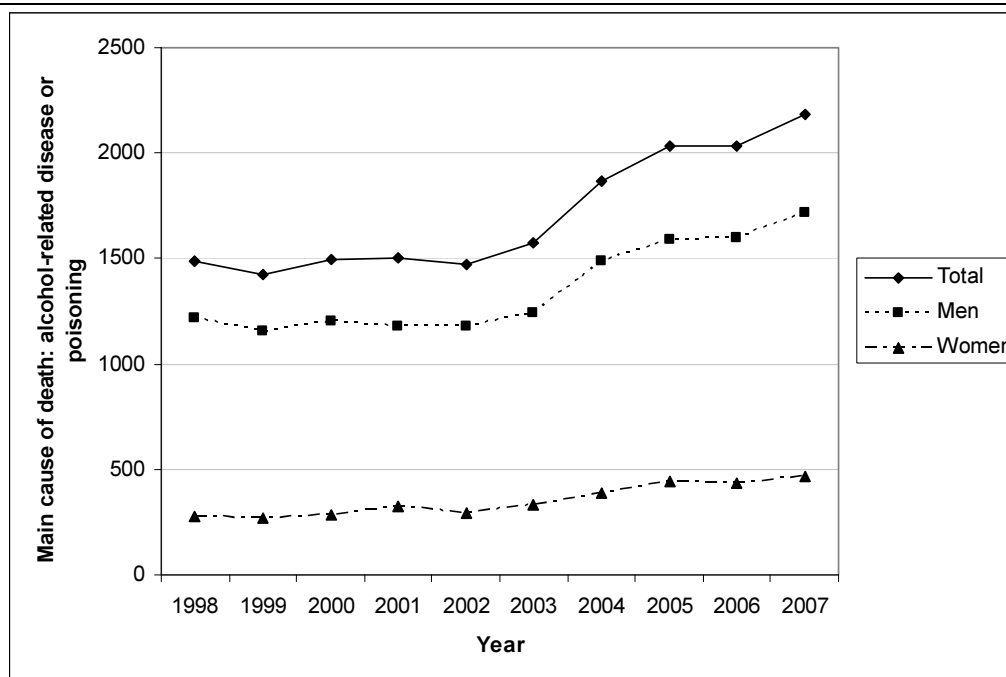
### Harms

Following the 2004 changes, government and independent studies indicate that there were significant increases in alcohol-related harms in Finland. The National Research and Development Centre for Welfare and Health (STAKES) in Helsinki reported that death from liver diseases increased in Finland by 30% in 2004 and a further 20% in 2005, a very significant amount (STAKES 2007; Mäkelä and Österberg 2009). Although there was an upward trend in many of these kinds of harms for some time prior to the 2004 changes, the developments that year exacerbated these harms, causing a more abrupt increase. The figure below shows the increase in deaths due to alcohol-related diseases and poisoning from 1998 to 2007.

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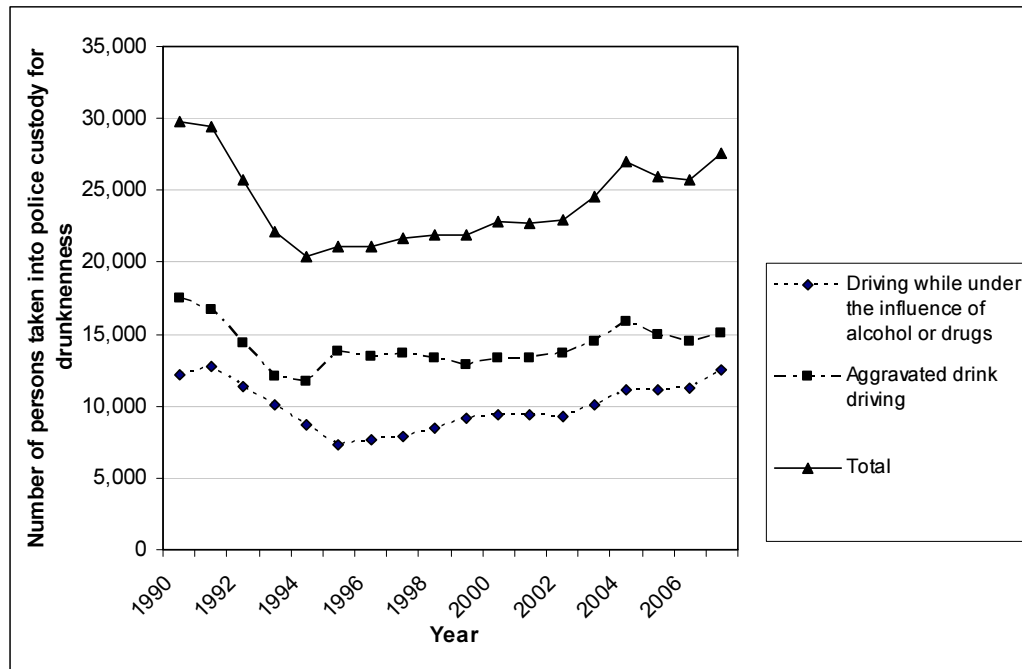
<sup>68</sup> A previous study by Mäkelä *et al* (2008) based on population surveys conducted before and after the 2004 changes found that there was no increase in the total volume of alcohol consumption. However, as the authors themselves suggest, the discrepancy between the findings from this study and those of other research may be partly explained by a group of respondents either dropping out of the survey or concealing the increase in their consumption when responding to the survey.



**Figure 6-11: Deaths due to alcohol-related diseases and poisoning, Finland 1998-2007**

Source: National Institute of Health and Welfare, Finland.

It has been found that in 2004, hospitalisations with alcohol-related diagnoses increased by 9%, the number of people taken into custody due to drunkenness by 11%, accidents involving drunk drivers by 7% (by 18% in the case of drivers between the ages of 18 and 24), and alcohol-related assaults by 3% (Tigerstedt *et al.* 2006; see also Finnish Ministry of Social Affairs and Health 2006; Mäkelä & Österberg 2009). Another peer review study also provides evidence of a substantial increase in alcohol-related mortality after the reduction in prices in 2004, particularly among those aged 50-69, those in lower educational and socio-economic groups, and heavy drinkers (Herttua *et al.* 2008). The figure below provides another example of these effects, showing the changes in recorded drink-driving offences.

**Figure 6-12: Drink-driving offences recorded by the police, Finland 1990-2007**

Source: National Institute of Health and Welfare, Finland.

A recent peer-review study conducted a more in-depth analysis of the effects of the changes by assessing the *differential* impact of the abolition of travellers' quotas and of a decrease in taxation and alcohol retail prices. The study found that following the 2004 changes there was a statistically significant increase in alcohol-positive sudden deaths in Finland, but that this effect was primarily the result of the decrease in retail prices rather than of the abolition of travellers' quotas (Koski et al 2007). That is, the abolition of travelers' quotas did not, by itself, lead to an increase in consumption sufficient to stimulate higher alcohol-positive sudden deaths in Finland (Holder 2007). Tax cuts, on the other hand, were found to have a 'significant and abrupt impact on the number of alcohol-positive deaths' starting in March 2004 (the month the tax cuts came into force), which was 'completely in line with the fact that there was a sharp increase in domestic alcohol sales after this date, suggesting that the increase in alcohol consumption has led to more sudden deaths' (Koski et al. 2007).

### 6.3.3 Implications

The findings from Finland present very robust evidence that the changes in 2004, in particular the decreases in alcohol taxation, have had increased consumption and on some alcohol-related harms (especially, as we have seen, alcohol-positive sudden deaths). The evidence indicates that most of this impact was primarily due to the reductions in alcohol taxation and not the increase in the amount of alcohol people were allowed to import for personal use. This is particularly interesting as it raises a number of questions about how policies work together, and what their unintended consequences might be. What is clear from the evidence is that while in themselves the abolition of travellers' quotas and their replacement with indicative levels for personal use may not have led to a significant increase in alcohol harms, they did stimulate a 'domestic response which lowered alcohol

prices and thus increased alcohol-related deaths' (Holder 2007, p. 347). It is possible that without such a decrease in taxation the change from quotas to (the much higher) indicative levels would, in the longer term, have had a more significant negative impact; and that the lowering of taxes not only prevented greater fiscal revenue losses for Finland, but also retained some of the protective effects of the retail monopoly by retaining sales in the country. The interesting question this case study raises, however, is: what is the optimum level of taxation (and of alcohol prices) that would reduce travellers' imports, retain the protective factors of the retail monopoly, and minimise the associated harms? (*ibid.*).

## 6.4 UK and France

Cross-border shopping from France to the UK offers a particularly interesting case study when analysing the affordability of alcohol in Europe. Alcohol is sold at significantly lower prices in France than in the UK, providing an incentive for cross-border shopping (EC, 2001; Smith, Z. 1999). A report commissioned by the EC states that 'in absolute terms, the UK is [the MS] losing the most amounts of revenue each year in cross border traffic' (EC, 2001, p4).<sup>69</sup>

Cross-border shopping is mainly carried out using private transportation (cars and vans) on ferries and through the Channel Tunnel. The south-east of England is the main area of concern with regards to cross-border shopping, because it has the most plentiful and convenient links to France (Crawford and Tanner, 1995; Hammond, 1998).

### 6.4.1 Alcohol context in the UK

The UK is one of the European countries where alcohol consumption is most problematic. Around half of all homicides and nearly three-quarters of incidents of domestic violence, sexual assault and rape are found to be affected by alcohol consumption (Prime Minister Strategy Unit 2003). In 2004 it was estimated that harmful alcohol consumption cost the UK health services between £1.4 billion and £1.7 billion per year. It was also estimated that alcohol misuse costs the UK government up to an additional £7.3 billion a year from the impacts of alcohol-related crime and anti-social behaviour, and £6.4 billion as a result of lost productivity in the workplace (Alcohol Harm Reduction Strategy Unit 2004).

Binge-drinking has been identified as the main driver of harmful alcohol consumption in the UK (Institute for Alcohol Studies 2008, p. 9). The government is attempting to deal with the extent of binge-drinking by implementing a range of measures, most notably awareness and education campaigns. It is also considering, amongst other strategies, whether to increase excise duties on alcohol in order to reduce problematic consumption as well as discussing how to tackle pre-loading and how to confront the increase in under-age binge drinking (Alcohol Concern 2007).

Problematic alcohol consumption in the UK is tied to the drinking culture, but it also results from the 45% increase in alcohol consumption since 1970 (Sheron *et al.*, 2008). In 2003, alcohol was in fact 50% more affordable than in 1980 (IAS, 2007). Similarly, the

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<sup>69</sup> The reports clarifies that 'in terms of market share, the problem is more acute in Denmark and Sweden, where about one quarter of spirits consumed are bought outside the consumers' own member state' (*ibid.*).

strength of alcohol drinks has been rising over time while alcohol measures served in pubs have been increasing (Sheron *et al*, 2008). Sheron and his colleagues explain that this evidence suggests it is possible to mitigate the harmful alcohol consumption trend the UK is currently experiencing through policy, as it is not inherent to the population (*ibid.*).

Cross-border shopping has had an impact on the UK's alcohol-related policies. For example, Österberg and Karlsson (2002) argue that the phenomenon has kept excise duties and VAT on alcohol lower than they would otherwise have been. The government has to balance its need to mitigate harmful alcohol consumption with its need to retain revenues on alcohol (*ibid.*).

#### 6.4.2 Alcohol taxation

The excise duty rates for alcoholic beverages in the UK and in France are indicated in Table 6.3. A comparison of these data shows that UK alcohol taxation is overall much higher than in France. Specifically, excise duty rates are seventy-two times higher in the UK than in France for most still wine, thirty-seven times as high for most sparkling wine, seven times greater for most beer, just under twice as high for most distilled spirits, and 1.5 times higher for most intermediate products (Crawford and Tanner, 1995; Hammond, 1998). Nevertheless, this incentive differs between regions and socio-demographic groups as purchasing alcohol in France entails transport costs to and from continental Europe (*ibid.*).<sup>70</sup>

**Table 6.3: Excise duty rates for alcoholic beverages in the UK and France in 2008 (eurocents)**

EU Member State	Beer (50cl of 5% ABV/12.5 degree Plato beer)	Distilled spirits (70cl of 40% ABV)	Still intermediate products (70cl of 20% ABV)	Still wine (750ml bottle of 12% ABV)	Sparkling wine (750ml of 12% ABV)
France	6.50	4.06	1.50	2.55	6.30
UK	47.21	7.55	2.29	183.92	235.58

Source: European Commission Directorate General Taxation and Customs Union

#### 6.4.3 Cross-border sales volume

HM Revenue and Customs (2008a) estimated in 2007 that cross-border shopping had resulted in over £150 million lost in revenues. Data on cross-border spirits shopping in fact found that it reflected 4% of the UK market share, or 15 million litres. No estimates were available for other alcoholic drinks but in 1998 HM Customs and Excise estimated that cross-border beer purchases were similar to those of spirits, while those of wine were triple this amount. Hence, it is likely that the total loss in revenues due to cross-border alcohol shopping is much higher than the £150 million estimate for cross-border spirits shopping.

These figures need to be considered alongside those relating to cross-border smuggling and tax fraud in order to get a more accurate picture of UK revenue losses, French profits, and the volumes of alcohol that reach England unaccounted for. Seely explains that '[cross

<sup>70</sup> This point is detailed later.

border shopping] has been accompanied by a substantial growth in excise fraud, from shoppers reselling goods they had bought on the Continent' (Seely 2002). The fraud occurs mostly through the diversion of goods into or out of the UK while still under duty suspension, and it applies mostly to beer (Serious Organised Crime Agency, 2008: 50; EC, 2001: 4). In 1998 HM Customs and Excise estimated that cross-border smuggling cost the UK economy £535 million annually, of which £305 million are revenue evaded.

In February 2006, a duty stamp regime was established to make it harder for fraudsters to engage in such excise duty fraud (Serious Organised Crime Agency 2008, p. 50). Bottles containing 35cl or more of spirits, wine, or made wine of 30% alcohol by volume and above need to be associated with a duty stamp that indicates that tax has been paid on those goods, or that it is due to be paid (HM Revenue and Customs 2008b).'

#### 6.4.4 Regulations: limits to volumes of cross-border shopping

As mentioned earlier in this chapter, changes in EU legislation have replaced quotas for cross-border alcohol purchases with indicative levels for personal use, which basically allow consumers to purchase large quantities of alcohol in one country for personal consumption in another, without having to pay extra duties (Seely 2002).<sup>71</sup>

It is legal to cross the border with a greater volume of alcohol, but *Excise Duties (Personal Reliefs) Order SI 1992/3155* states that the traveller will need to prove that the purchase was for personal use.<sup>72</sup>

It was reported in 2002 that out of the 14 million people who had crossed the Channel in the previous year, only 0.2% were stopped and questioned by Customs. The majority of these travellers were able to convince officials that the goods they were carrying, whether alcohol or tobacco, were for personal use, and therefore were allowed to continue travelling (*ibid.*).

#### 6.4.5 Influence of cross-border alcohol shopping on consumption

It is particularly difficult to measure the impact of cross-border alcohol shopping and smuggling on the UK population. However, some preliminary findings can be derived from looking at the differences in consumption patterns between the South East of England, which is a key UK gateway to France, and in other UK regions (Crawford and Tanner, 1995; Hammond, 1998).

Phillip Hammond, chief secretary to the UK Treasury, explains that the trip to Calais costs a set, relatively high, amount of money, making it most efficient to buy alcohol in France in bulk. Bulk buying and going away to France are 'not open to low-income households, [or] to households without a car...' (*ibid.*); it is mainly a middle-class phenomenon (*ibid.*). As the NHS (2008, p. 14) states, those in middle-income households are also 'more likely

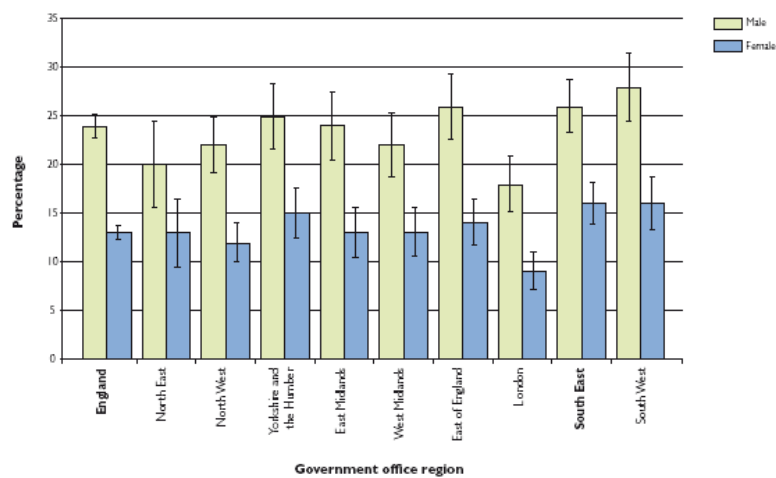
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<sup>71</sup> As discussed elsewhere in this report, the volume of alcohol that travellers can carry while crossing the border without being questioned was determined on January 1st 1993 as follows: 10 litres of spirits, 20 litres of fortified wines, 90 litres of wine (of which, no more than 60 litres of sparkling wine), and 110 litres of beer. These are the indicative levels for personal use.

<sup>72</sup> See: [http://www.opsi.gov.uk/SI/si1992/Uksi\\_19923155\\_en\\_1.htm](http://www.opsi.gov.uk/SI/si1992/Uksi_19923155_en_1.htm) (last accessed January 2009).

to drink more frequently and to drink above the daily recommendations' than lower-income households, but they are less likely to binge-drink.<sup>73</sup> It is worth noting, however, that there is likely to be some cross-border alcohol consumption by lower income households, who often vacation in the continent as well.

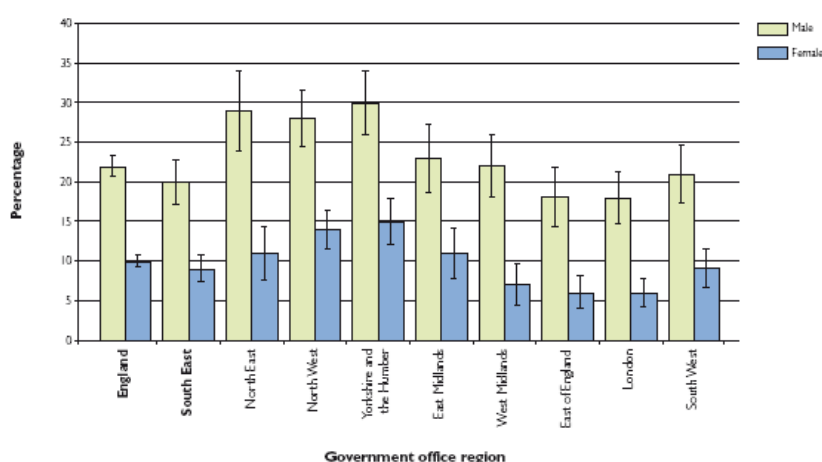
Precisely such a pattern of drinking has been found in the South East of England. The South East of England Public Health Observatory reports that in 2007, this region's adult population was the most likely to drink five days a week, along with the South West and the East of England (Figure 6-13). Binge drinking was however most prevalent in the North East and North West of England as well as Yorkshire and the Humber (cfr. Figure 6-14).



SOURCE: General Household Survey, Office for National Statistics (2004), cited in the South East Public Health Observatory (2007).

**Figure 6-13: Percentage of adults drinking on five or more days in the last week, by gender and region, in England in 2004 (95% confidence limits)**

<sup>73</sup> The NHS refers to managerial and professional, not middle-class households, and to routine and manual, rather than lower-income households.



SOURCE: General Household Survey, Office for National Statistics (2004), cited in the South East Public Health Observatory (2007).

**Figure 6-14: Percentage of adults binge-drinking on at least one day in the last week, by gender and region, in England and Wales in 2004**

It is unlikely that cross-border shopping explains all the difference in the rates of weekly and binge-drinking between the South East of England and elsewhere in the UK. Part of this difference is likely to be due, for example, to the fact that the former is one of the most affluent regions in the UK. It is also possible that the south-eastern population's socio-demographic characteristics combined with proximity to facilities for travel to the continent explain at least some of the difference. Nevertheless, further research would be needed to ascertain the extent to which cross-border alcohol purchases influence consumption patterns in the UK.

#### 6.4.6 Alcohol harms

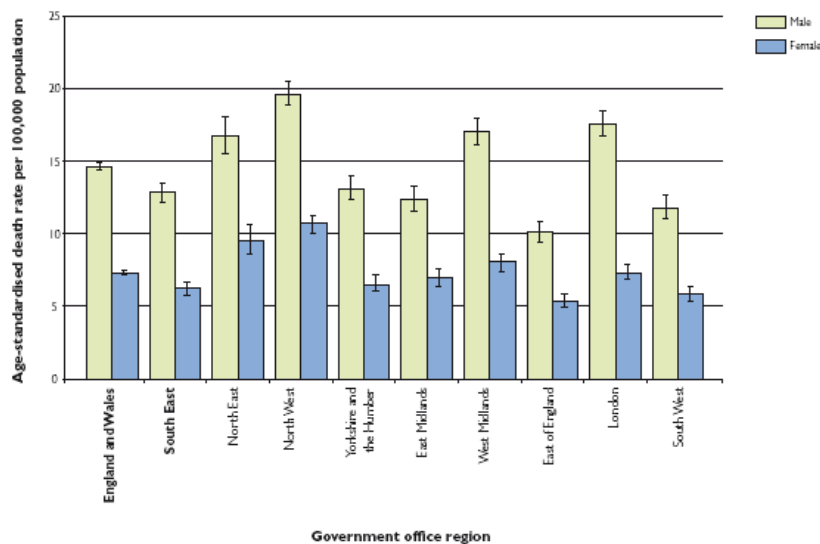
The consumption pattern described above is associated with long-term excessive alcohol-use morbidity and chronic mortality, rather than with intoxication-generated morbidity and acute mortality.<sup>74</sup> Although alcohol-specific mortality rates are below the national average in the South East of England (see Figure 6-15), the Public Health Observatory reports that this region is amongst the four that exceed the national average of incapacity benefit and severe disablement allowance claimants with a main diagnosis of alcoholism.<sup>75</sup>

<sup>74</sup> The mortality effects of alcohol may be separated into two categories: acute mortality and chronic mortality. Acute mortality involves a wide array of direct incidents such as traffic accidents and poisoning, and is often the result of, or mediated by, intoxication. Chronic mortality stems from diseases associated with the adverse effects of (excessive) alcohol use, e.g. liver cirrhosis, and the effects are thereby less direct than in acute mortality cases. Acute mortality includes for example falls, intentional injuries, traffic casualties, and accidental poisoning, whereas chronic mortality refers to alcohol-use disorders, liver cirrhosis, mouth and oropharynx cancer, ischaemic heart disease among others (Rabinovich *et al.* 2008).

<sup>75</sup> Alcohol-specific mortality includes, stroke, alcoholic liver disease, cancer of other digestive organs, cancer of the oesophagus, pneumonia and influenza, road accidents, intentional self-harm, chronic hepatitis, fibrosis, and

It is also a region in which alcohol has a particularly great impact on the workforce. There is, in this region, the greatest need in the country after London for alcohol intervention due to alcohol dependence. These outcomes are associated with long-term alcohol abuse, such as high rates of weekly drinking, rather than occasional intoxications caused by binge-drinking, for example.

Figure 6-16 below shows that the local authorities bordering the Channel Tunnel and cross-Channel ferry ports – namely, Shepway, Canterbury, Thanet and Dover – also have particularly high alcohol-specific hospital admission rates compared to the other local authorities in the region. While there is not enough evidence to establish a definitive relationship between the two, the higher alcohol-specific hospital admission rates in these areas could be associated with the higher cross-border shopping opportunity (i.e. people living closer to these are more likely to engage in the opportunity to shop cross-border). As before, though, this hypothesis requires further research.

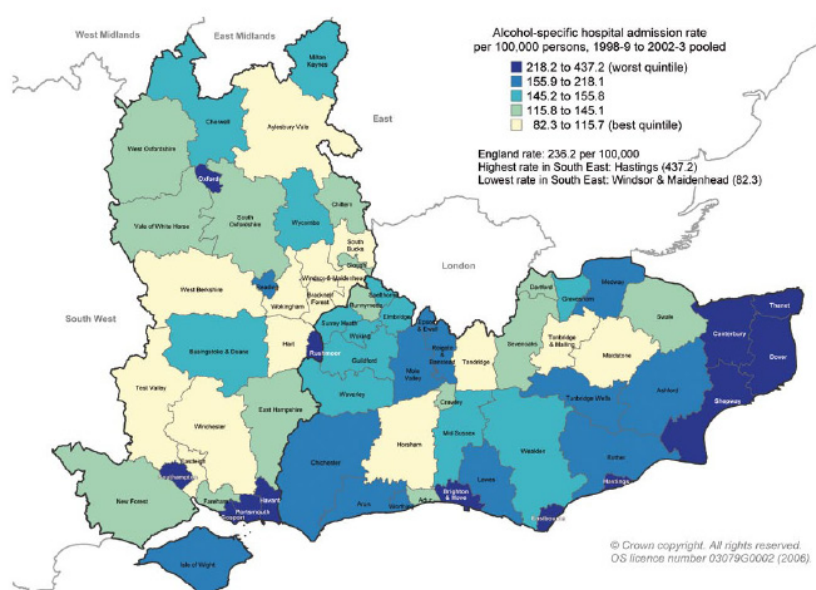


Source: Office for National Statistics (2003), cited in the South East Public Health Observatory (2007).

**Figure 6-15: Alcohol-specific mortality rates by gender and region in England from 2001 to 2003**

cirrhosis of liver, stomach cancer, fall injuries, lip cancer, ischemic heart disease, event of undetermined intent, breast cancer, mental and behavioural disorders due to use of alcohol, cancer of the liver and intrahepatic bile ducts, gastric ulcer, and other causes (South East of England Public Health Observatory, 2007: 18).





Source: Goldacre *et al.* (2005), cited in the South East of England Public Health Observatory (2007).

**Figure 6-16: Alcohol-specific hospital admissions rate by local authority in the South East of England from 1998 to 1999 and 2002 to 2003**

Nevertheless, the South East of England has a lower than national average on alcohol-related crime offences and sexual violence, and is at the national average of negative or refused breath tests for drink-driving offences (South East of England Public Health Observatory, 2007). Unlike with health risks, other indicators of alcohol harms are not higher in local authorities bordering the Channel Tunnel and cross-Channel ferry ports than in other areas of the region.

#### 6.4.7 Implications

Cross-border shopping (and smuggling) seems to pose a problem to the UK from a financial perspective. The loss of excise revenue represents a loss equivalent to 5% of annual alcohol revenues a year, while cross-border smuggling reflects almost twice that loss.

Some experts suggest that this has had an impact on the UK fiscal system, keeping excise duties on alcohol lower than they might otherwise have been. They argue that this can come into conflict with the UK's intention to use excise duty rates as a public health instrument, which they believe is in the country's interest. In this view the single market has had wider ramifications than affecting competition, and thereby welfare and efficiency, as well as transport and consumer confidence (Allen *et al.* 1998).

The impact that cross-border shopping (and smuggling) has had on consumption and harms in the UK is less clear. The data on consumption and harms is very weak but could be interpreted to suggest that there may be a link between cross-border shopping, consumption and harms. The data available and the possible scale of the harms involved

(particularly when looked at in the context of the other case studies) suggest this is an important area for research.

## 6.5 Closing remarks

Some common themes emerge from the case studies. First, the Swedish case study in particular showed that alcohol purchased abroad can be a large fraction of total alcohol consumption. In Sweden as a whole, nearly a fifth of the alcohol consumed has been purchased abroad. In border regions, this percentage is even higher. In Finland the volume of alcohol purchased abroad is also significant, amounting to approximately 14% of total alcohol consumption.

Second, cross-border purchases affect the tax revenues that can be collected by national tax authorities. In the UK it is estimated that £150 million of tax revenues are lost due to cross-border purchases. In several countries, including Finland and Denmark, this has also triggered a reduction in domestic taxes, to protect the tax basis and trade.

Third, we see a strong effect between the reduction of controls on imports for personal use and an increase in cross-border purchasing. All three countries we studied had to adjust travellers' allowances to apply the standard guidance on what constitutes personal use of alcoholic beverages. In the gradual adoption process, particularly in Sweden, we see an increase in purchasing in line with the increase of limits on imports for personal use.

Fourth, there is strong evidence that increased cross-border purchasing led to an increase in consumption in Finland and Sweden; thus consumers have not just replaced their existing alcohol consumption with cheaper alcohol, but also increased their total alcohol consumption levels. What still needs to be explained however is the levelling off of or even drop in consumption once consumers adjusted to the availability of cheap alcohol in neighbouring countries, a phenomenon witnessed in Sweden and to a lesser extent in Finland after 2004.

Fifth, there is some evidence of a relationship between changes in travellers' quotas and alcohol-related harms in the countries examined here. The evidence for this is robust in Finland, suggestive in Sweden, but still inconclusive in the UK.

Finally, the evidence clearly shows the difficulties facing MS that have traditionally used high levels of alcohol taxation as a tool to curb harmful and hazardous alcohol consumption. From these case studies it is evident that lower taxation in neighbouring countries, typically reflected in lower prices, attracts cross-border shoppers and effectively reduces the average price of alcohol in a country. This effect is reinforced when countries reduce their excise duty rates to protect their tax base, which further reduces the price of alcoholic beverages.

It is worth noting that the findings presented in this chapter refer to three case studies of cross-border alcohol consumption between countries sharing sea borders. It is unclear from this analysis whether these findings would be replicated in studies of cross-border consumption between other neighbouring EU countries with significant alcohol tax differentials. As suggested earlier in this chapter, it is possible that countries with

significant tax or price differentials sharing land borders experience even higher levels of cross-border alcohol shopping, although further research would be needed to ascertain this. In addition, these case studies raise other interesting research questions. For example, are there any observable patterns in the demographic and socio-economic characteristics of those who cross borders to purchase alcohol? Finally, further research would be necessary, in particular in the cases of the UK (and Sweden to a lesser extent) on the links between cross-border alcohol consumption and alcohol-related harms. Further research would be necessary to shed light on these and other aspects of cross-border shopping between other EU neighbouring countries with significant alcohol tax differentials.



## CHAPTER 7 **EU and national legislation affecting alcohol pricing**

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Chapter 3 provided an overview of taxation and retail of alcoholic beverages across the EU. Like taxation, legislation and regulations affecting the production, distribution and sale of alcoholic beverages are other key determinant of alcohol prices. This chapter explores the current status of legislation affecting the price of alcohol in the region at the EU level and in individual MS.<sup>76</sup> In particular, this chapter examines: alcohol taxation at the MS and EU-level; legislation on discriminatory taxation and on monopolies; regulations on minimum pricing; regulations on sales below cost and other sales promotions; indicative levels for cross-border alcohol shopping for personal use, and; EU agricultural policy.

### **7.1 National taxation and EU minimum excise duty rates**

Excise duty rates on alcoholic beverages vary across EU Member States. However, harmonization of excise duties is a long-standing goal of the European Union, particularly because the single European market means that variation in excise duty rates leads to lost tax revenue from increasing cross-border trade for the higher-taxation countries (Anderson and Baumberg 2006). In the case of alcohol, the extent of cross-border shopping – and the resulting revenue loss for the higher-tax countries – is increased by the recent replacement of travellers' quotas with indicative levels for personal use for cross-border alcohol purchases. As a result of these pressures, the Commission has made several proposals for the harmonisation of excise duties on alcoholic beverages in the EU since the early 1970s. The 1992 proposal was finally accepted, although as the adoption of fiscal policy in the EU requires unanimous agreement, this proposal was limited to the introduction of minimum excise duty rates rather than full harmonisation.

The proposal included Directive 92/84/EEC, which instructs MS on how to define the products and product categories to be taxed, and the principles of how to set the excise duty rates for these products. The Directive also sets a minimum excise duty rate for distilled spirits, beer and intermediate products (such as fortified wines and liqueur wines), but not for wine and fermented beverages other than wine and beer (Cnossen 2006).

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<sup>76</sup> Unless referenced, the information in this chapter was taken from a survey conducted by RAND among members of the European Health and Alcohol Forum and the Committee on National Alcohol Policy and Action. Because this chapter relies on survey responses for information on legislation at MS level, the chapter includes information only on those countries for which responses were received.

Above these minimum rates, the directive states that EU MS retain sovereignty to set excise duty rates at the levels they consider appropriate given each country's particular circumstances. The Directive also includes provisions for small distilleries and breweries, as well as for wine and beer of low alcohol content (less than 8.5% and 2.8% respectively), which benefit from reduced rates (Kischel 2003).<sup>77</sup> Details on the minimum excise duty rates set by this directive are provided in Chapter 2.

The Directive requires that the Commission review these minimum rates periodically. However, the rates were not modified after they were originally set in 1992, representing a reduction in their real value of almost 30% (Cnossen 2006). In 2006, the Commission adopted a proposal to increase the minimum excise duty rates on alcoholic beverages, increasing the rates in line with inflation between 1993 and 2005 (around 31%).<sup>78</sup> This revalorisation of the rates was expected to have a very small impact on national excise duty rates, as most are already set at levels that exceed the requirements of the revised Directive. Nonetheless, a small number of countries would have been required to increase their national rates on some alcoholic beverages, which are currently set at a lower level than the minimum after revalorisation.<sup>79</sup> This proposal was rejected in July 2007, and no further action on this proposal appears to have been taken since (although it is technically still on the table).<sup>80</sup>

#### 7.1.1 Taxation of alcopops

The taxation of alcopops has received particular attention in recent years in the EU. Alcopops are highly sweetened, pre-mixed spirit-based drinks, typically designed and marketed for adolescents and young adults (Metzner and Kraus 2007). Their high level of consumption among this population group has led to concerns that alcopops are a main contributor to alcohol-related harm among young people, including under-age groups. In view of this, a number of MS and other European countries have increased taxes on alcopops, with the explicit aim of reducing alcohol consumption and harms among young and under-age drinkers.

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<sup>77</sup> Council Directive 92/83/EEC on the harmonization of the structure of excise duties on alcohol and alcoholic beverages makes additional specifications regarding alcohol taxation in the EU. It sets out definitions of the different types of alcoholic beverages, describes how alcohol excise duties levied by MS should be fixed, and outlines a number of exemptions from the harmonized excise duty. These exemptions include alcohol that has been completely denatured; alcohol that is completely denatured and used for the manufacture of products not for human consumption; alcohol used in the production of certain types of vinegar, medicines and flavours for the preparation of foodstuffs and non-alcoholic beverages, and; alcohol used directly or as a constituent of semi-finished products for the production of foodstuffs. (provided the alcoholic content of these foodstuffs does not exceed a specified amount) (available at: <http://www.legaltext.ee/text/en/T41022.htm>, accessed November 2008).

<sup>78</sup> Please see: European Commission Directorate General for Agriculture and Rural Development: [http://ec.europa.eu/taxation\\_customs/taxation/excise\\_duties/alcoholic\\_beverages/index\\_en.htm](http://ec.europa.eu/taxation_customs/taxation/excise_duties/alcoholic_beverages/index_en.htm) (accessed July 2008).

<sup>79</sup> See: Europa press releases: Alcohol taxation: Commission proposes increases in minimum rates: <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/06/1165&format=HTML&aged=0&language=en&guiLanguage=en> (accessed July 2008).

<sup>80</sup> See: PRELEX database: [http://ec.europa.eu/prelex/detail\\_dossier\\_real.cfm?CL=en&DosId=194633](http://ec.europa.eu/prelex/detail_dossier_real.cfm?CL=en&DosId=194633) (accessed July 2008).

In the UK, alcopops were classified as distilled spirits in 2002, which made alcopops subject to spirits excise duty leading to an increase in their price. Germany also re-classified alcopops, in 2004, leading to an increase in alcopop taxation to levels higher than those of spirits taxation. In 1996, France also increased taxation on alcopops, later committing to using the revenue from this tax on programmes to combat alcoholism. Luxembourg and Denmark also levy special taxes on alcopops. Finally, the Swiss government also re-classified alcopops and created a special tax on this type of beverage, which was four times higher than that for distilled spirits.

While opinion is to some extent split regarding the effectiveness of these special alcopop taxes in reducing alcohol consumption and harms especially among young drinkers, there is as yet little reliable research on this issue (Metzner and Kraus 2007). Even where reductions on alcopop sales have been reported, it is unclear whether drinkers reduced their overall alcohol consumption, or merely replace alcopops with other types of alcoholic beverages. Research from Switzerland, for example, indicates that alcopops are consumed *in addition* to conventional alcoholic beverages instead of replacing them (Wicki *et al.* 2006), which could suggest that at least in this country, a reduction in the consumption of alcopops would lead to a reduction in the overall level of alcohol consumption.

## 7.2 **Legislation on discriminatory taxation and monopolies**

Discriminatory taxation is prohibited in the EU by Article 90 of the EC Treaty. This article specifies that no Member State shall impose, directly or indirectly, internal taxation of any kind on the products of other Member States in excess of that imposed directly or indirectly on similar domestic products. The Article also states that no Member State shall impose any internal taxation that would afford indirect protection to other products, on the product of other Member State (*ibid.*).

Since the 1970s, on the basis of this Article, the European Court of Justice (ECJ) ruled against a number of EU Member States that had in place what were considered discriminatory tax practices on alcohol. Examples include the banning of lower excise duty rates on Aquavit relative to foreign spirits in Denmark, of the relatively heavier taxation by alcohol content of wine versus beer in the UK, and exclusive alcohol import rights by the Swedish government (Cnossen 2006; Baumberg and Anderson 2008).<sup>81</sup>

Following their accession to the EU, significant elements of the alcohol monopolies of Finland and Sweden were removed by the European courts (production, wholesale, import and export). However, these countries were allowed to retain the off-premise alcohol retail monopoly (of alcoholic beverages of greater than 4.7% and 3.5% alcohol by volume in Finland and Sweden respectively), following a case brought by Swedish shopkeeper Harry Franzen, who sold wine in a regular retail outlet. The ECJ ruled in this case that the operations of the Swedish off-premise retail alcohol monopoly, Systembolaget, were not discriminatory or in conflict with the EC Treaty. In this way, the ECJ ruling ‘guaranteed

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<sup>81</sup> For a comprehensive review of ECJ and European Free Trade Association (EFTA) case law on alcohol, see Baumberg and Anderson (2008).

the existence not only of the Swedish off-premise state alcohol retail monopoly but also of the Finnish, Icelandic and Norwegian corresponding monopolies' (Tigerstedt *et al.* 2006).

### 7.3 Minimum pricing

Minimum prices for alcoholic beverages, also sometimes called Social Reference Prices, are used in different ways in a number of areas outside the EU, including several Canadian provinces (Saskatchewan, Ontario, Newfoundland, New Brunswick, etc) where the regulation applies to licensed on-trade premises (Strang 2008). But while a recent Scottish expert consultation concluded that minimum pricing is possible under EU competition law, 'provided that minimum prices are imposed on licensees by law or at the sole instigation of a public authority' (SHAAP 2007, minimum pricing practices have tended to be seen as trade-distorting by the European courts (as setting an artificial price floor amounts to resale price maintenance, limiting and distorting price competition), and therefore not typically put in place in the EU (Baumberg and Anderson 2008).<sup>82, 83</sup>

Nevertheless, there are regulations in a small number of European countries (both EU and other European states) that act as 'proxies' for minimum price regulations. For example, in Germany the so-called Apple Juice law states that in the on-premise trade, at least one alcohol-free beverage must be cheaper than the cheapest alcoholic beverage available. In Switzerland in some cantons (provinces) all restaurants are obliged by law to offer *at least three* non-alcoholic drinks cheaper than the cheapest alcoholic beverage for the same quantity.

The debate about minimum pricing as a policy measure to counteract very low alcohol prices is gaining pace in Europe. In the UK, for example, certain sectors of the media speculated that minimum pricing might be introduced by bypassing UK competition law through a special legal clause that allows ministers to overturn rules in cases of "exceptional public policy".<sup>84</sup> In a House of Commons report on policing in the 21<sup>st</sup> Century (UK Home Affairs Committee 2008), UK parliamentarians also recently argued that minimum prices for on- and off-premise alcohol sales could be an effective measure against alcohol problems such as nuisance behaviour and violence in city centres, although the legal

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<sup>82</sup> Also, personal communication from European Commission Directorate General Competition official, January 2009.

<sup>83</sup> Minimum prices had also been considered, and even introduced through legislation in a few Member States such as Austria and Ireland, for cigarettes as a public health measure, but these moves were contested by the European Commission. This was in line with the jurisprudence of the European Court of Justice, which considers that minimum prices infringe Community law, distort competition and benefit manufacturers by safeguarding their profit margins. Council Directive 95/59/EC states that manufacturers and importers of tobacco products have the right to determine the retail selling price of their products; according to ECJ jurisprudence minimum prices impair this right and are therefore not compatible with this Directive. The ECJ also stated that minimum prices are not necessary since their health objectives can be achieved through increases in taxation (Swedish National Institute of Public Health (2006) *Alcohol and the EU*, Sweden (available at: [http://www.fhi.se/upload/ar2006/Ovrigt/Alkohol\\_EU\\_news/News12.pdf](http://www.fhi.se/upload/ar2006/Ovrigt/Alkohol_EU_news/News12.pdf), accessed January 2008).

<sup>84</sup> See for example: <http://www.offlicencenews.co.uk/articles/59808/Experts-cast-doubt-on-minimum-prices-for-alcohol.aspx?categoryid=9059> (last accessed October 2008).



opportunities for such a measure remain ambiguous.<sup>85</sup> Scottish ministers recently proposed to force all licensed premises to charge a minimum price for alcoholic drinks (based on ABV rather than on type of drink). This minimum price would be set by government.

#### 7.4 Sales below cost and other sales promotions

There is evidence that alcohol sales promotions such as ‘happy hours’ (temporary price cuts), ‘two for one’ and others increase alcohol consumption among youth as well as increasing the likelihood that they will binge drink (Meier *et al.* 2008). Alcohol sales below cost and other alcohol sales promotions are common in many countries across the EU (Baumberg and Anderson 2008). Different countries, however, have different approaches to these; while some countries ban sales below cost and/or alcohol sales promotions, in others there are no regulations applying to these, or only self-regulation is in place.<sup>86</sup>

In Belgium, Luxembourg and Poland, for example, laws on commercial practices and consumer protection ban alcohol sales below cost. Some Spanish provinces, such as Castilla y Leon and Cataluña, have banned alcohol promotions that ‘directly incite’ excessive alcohol consumption. In Ireland, there was a ban on sales below cost, but this was removed in 2006, although bans on ‘happy hours’ and ‘two for one’ promotions in on-trade premises are still in place. In addition, a code of practice is being developed between retailers and the Irish government on the placement and promotion of alcohol in stores. In other countries, including the England and Latvia, interest in legislating on these issues has become more prominent in the policy arena. In England, there were recent calls from parliamentarians to ban both pub “happy hours” and supermarkets selling alcohol as a loss leader.<sup>87</sup>

In an example of comprehensive regulation on alcohol promotions, the Scottish Licensing Act 2005, which will come fully into force on 1 September 2009, stipulates that a number of price promotions will be banned, including, among others: promotions that involve the supply of an alcoholic drink at a reduced price on the purchase of one or more drinks, whether alcoholic or not (in on-sales premises only); promotions that involve the supply of unlimited amounts of alcohol for a fixed charge, including any charge for entry to the premises (in on-sales premises only); promotions that encourage, or seek to encourage, a person to buy or consume a larger measure of alcohol than the person had otherwise intended to buy or consume (in on-sales and off-sales premises); promotions that reward or encourage, or seek to reward or encourage, drinking alcohol quickly (in on-sales and off-sales premises).

Other measures being considered for inclusion in the Act are: a ban on off-sales premises supplying alcohol free of charge or at a reduced price on the purchase of one or more of

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<sup>85</sup> See: [http://news.bbc.co.uk/2/hi/uk\\_news/7718950.stm](http://news.bbc.co.uk/2/hi/uk_news/7718950.stm) (last accessed November 2008).

<sup>86</sup> Many countries have developed regulations to control the promotion of alcohol in terms of advertising, the provision of alcohol in fairs, exhibitions, and similar events, the supply of alcohol free of charge in different types of venues, and the use of alcohol as prizes in competitions, etc.

<sup>87</sup> See: [http://news.bbc.co.uk/2/hi/uk\\_news/7718950.stm](http://news.bbc.co.uk/2/hi/uk_news/7718950.stm) (last accessed November 2008).

any product, whether alcohol or not (which would end “3 for 2” promotions and other quantity discounts); a ban on the sale of alcohol as a loss-leader, and a minimum retail pricing based on the strength of the product (i.e. drinks could not be sold at less than X pence per unit of alcohol). In addition, the Scottish legislation bans “happy hours” by preventing the variation of a price within seventy-two hours of it last being varied.

Within Scandinavia, differences between the countries are evident in their approach to alcohol promotions. In Finland, while sales below cost are not banned, quantity discounts are, both in on- and of-premise sales, as well as advertising of alcohol discount prices outside on-trade premises unless the prices advertised are valid for two months or more. The scope of this regulation, however, is limited: ‘happy hours’ are still allowed, but *advertising* of ‘happy hours’ outside a bar or restaurant is not. In Sweden, national legislation stipulates that the price of alcohol cannot be lower than the cost price plus a ‘reasonable addition’. The Swedish Institute of Public Health recommends that this addition should be of 25% or over the cost price. Norway, like Sweden, has a ban on the use of alcohol as a loss-leader in off-premise sales, as well as on ‘happy hours’ and other price promotions.

Finally, alcohol promotions are subject only to self-regulation only in a number of countries. In The Netherlands, for example, the Dutch Foundation for the Responsible Use of Alcohol (STIVA) – an industry organisation – developed an advertising code containing rules for alcohol promotions. For example, according to the code premises are not allowed to sell alcohol for less than half its normal price, or to offer it free of charge, or to offer more than one alcohol discount promotion per customer (Van Hoof *et al.* 2008). Another industry body, the Royal Dutch Catering Industry, also developed its own code of good practice in alcohol sales, and supports a ban on alcohol discounts as a measure to prevent nuisance behaviour and violence (*ibid.*). In many Spanish provinces, only self-regulation is in place to control alcohol sales promotions. In the UK, the British Beer and Pub Association (BBPA), an industry body, had developed a self-regulation code banning alcohol promotions that encourage irresponsible drinking, such as ‘two for one’ promotions, but it was revoked in June 2008; according to the BBPA this was in response to concerns about the potential conflict between this code and European competition law. However, media reports indicate that the British Department for Business and Enterprise stated that the code was unlikely to contravene competition rules.<sup>88</sup>

## 7.5 Indicative levels of cross-border alcohol purchases for personal use

As discussed elsewhere in this report, since the 1980s the Commission had made several proposals for the harmonisation of alcohol excise duties across the EU. The 1992 proposal, which was accepted, fell far short of full harmonisation. In part due to the inability of the 1992 Directive to fully harmonize alcohol duty rates, the Commission significantly increased quotas on travellers’ alcohol imports between EU Member States in 1993.<sup>89</sup> The

<sup>88</sup> See: [http://news.bbc.co.uk/2/hi/uk\\_news/7528858.stm](http://news.bbc.co.uk/2/hi/uk_news/7528858.stm) (last accessed January 2009).

<sup>89</sup> Travellers entering the EU from a non-EU country were allowed to bring with them up to 1 litre of alcohol and alcoholic beverages of an alcoholic strength exceeding 22% vol, or undenatured ethyl alcohol of 80% vol.

aim of this measure was to facilitate cross-border shopping of alcohol (where travellers from high-taxation countries would purchase alcohol in low-taxation ones) thus creating a market incentive for increased excise duty harmonisation to curtail the loss of fiscal revenue (Tigerstedt *et al.* 2006).

According to current EU legislation, there are no limits on what individuals can buy and move from country to country within the EU as long as the goods are for personal use and not for resale. Some restrictions, however, apply to goods subject to excise duty, most notably alcohol and tobacco. As with other goods, those subject to excise duty must be for personal use only, and in order to determine this, Member States must take into account a number of factors, which includes, among others, the quantity of the product brought from another MS. Each MS can develop guidelines on specific levels considered for personal use, but these cannot be below the levels set by EU law.<sup>90</sup> For alcohol, these indicative levels for personal use are:

- spirit drinks: 10 litres
- intermediate products: 20 litres
- wine (including a maximum of 60 litres of sparkling wines): 90 litres
- beer: 110 litres

A few temporary exceptions and derogations applied, most notably that travellers returning to Finland and Sweden from other EU MS were allowed to bring in only 1 litre of distilled spirits or 3 litres of intermediate products, 5 litres of wine and 15 litres of beer (these derogations were originally meant to end in 1996, but following renegotiations the deadline was pushed back to 2003 for Finland and 2004 for Sweden, during which time quotas were to be gradually adjusted) (Tigerstedt *et al.* 2006). Denmark also had an exception on the quotas regulation applying only to distilled spirits, which expired in 2003.

## 7.6 Alcoholic beverages and agricultural policy

The EU's agricultural policy pertaining to alcohol is most developed in the area of wine production. Wine makes a significant contribution to the total value of agricultural output in several EU Member States, including Portugal, Spain, Italy and France. The EU is the world's largest exporter of wine, accounting for 70% of global exports, and 54% of global

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and over; or up to 2 litres of alcoholic beverages of an alcoholic strength not exceeding 22% vol.; up to 4 litres of still wine, and 16 litres of beer (only for VAT and excise duty), as goods having no commercial character (i.e. only for private consumption or as gifts) (See [http://ec.europa.eu/taxation\\_customs/common/travellers/enter\\_eu/index\\_en.htm](http://ec.europa.eu/taxation_customs/common/travellers/enter_eu/index_en.htm), last accessed November 2008).

<sup>90</sup> See: [http://ec.europa.eu/taxation\\_customs/common/travellers/within\\_eu/index\\_en.htm](http://ec.europa.eu/taxation_customs/common/travellers/within_eu/index_en.htm) (last accessed November 2008).

consumption.<sup>91</sup> The common market organisation of the EU in the wine sector has a twofold aim: to secure the survival and good standard of living of small family wine farmers, and to guarantee the supply of wine to consumers at competitive prices. The policy has been subject to a number of reforms since its inception in the 1960s and its aims have also evolved; reforms undertaken in 1999/2000, for example, aimed to improve competitiveness in the world market (Österberg and Karlsson 2003). In 2008, new regulations were again put in place, which also aimed to increase competitiveness in the wine market, for example by bolstering wine promotion in third countries.<sup>92</sup> The production of wine is supported through the Common Agricultural Policy (CAP) by more than €1.5 billion per year (Österberg and Karlsson 2003).

Wine is the only alcoholic beverage that is included in the common agricultural policy. However, other alcohol-related agricultural products also feature, including hops, a product used almost exclusively in the production of beer (*ibid.*).

## 7.7 Closing remarks

As the place of alcohol in economic, social and cultural life varies considerably across EU Member States, so do their interests with regard to alcoholic beverages. This chapter shows that the extent and nature of alcohol pricing and marketing policies varies across Member States.

In addition, MS priorities and policies with regards to alcohol, in turn, do not always fully coincide with those of the EU as a whole. For decades the EU's interest in alcohol was largely based on economic considerations, primarily in connection with the region's agenda for the common development of agriculture. This interest has also concerned alcohol production and trade, including trade with third countries. In contrast, in a few Member States – most notably in Scandinavia – alcohol taxation has traditionally had a strong public health focus and aimed to reduce hazardous and harmful alcohol consumption. As mentioned in previous chapters, EU policies on alcohol (notably high travellers' quotas for cross-border alcohol purchases) can infringe on a MS's ability to set their own alcohol policies independently. While there is growing concern at the EU level about the public health impact of policies bearing on alcohol prices, the use of pricing policies as a tool to curb harmful and hazardous alcohol consumption is still primarily at the MS, and even local, level.

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<sup>91</sup> See: European Commission Directorate General for Agriculture and Rural Development: [http://ec.europa.eu/agriculture/markets/wine/index\\_en.htm](http://ec.europa.eu/agriculture/markets/wine/index_en.htm) (accessed July 2008). Also: Österberg and Karlsson 2003.

<sup>92</sup> See: European Commission Directorate General for Agriculture and Rural Development: [http://ec.europa.eu/agriculture/capreform/wine/index\\_en.htm](http://ec.europa.eu/agriculture/capreform/wine/index_en.htm) (accessed July 2008).

The present analysis of alcohol affordability in the EU contributes to extensive previous research that demonstrates that alcohol price can be a very important policy lever for governments aiming to curb harmful and hazardous alcohol consumption. Policies affecting prices – most notably taxation but also retail monopolies and other measures that directly or indirectly affect the price of alcohol – have been shown to be effective instruments for reducing alcohol consumption and alcohol-related harms (WHO 2004; Chisholm *et al.* 2004; Babor *et al.* 2003). As shown in the previous chapter, there are a range of measures available to governments, as well as to economic operators, that can influence the price and therefore the consumption of alcoholic beverages. Many of these are already used in some places across the EU.

Nevertheless, a number of questions remain regarding how, or even whether, these different measures should be used uniformly across Europe. For example, there are questions around the issue of subsidiarity: is there a case for EU-level action on alcohol affordability/pricing, and if so, what is it? And, when it comes to alcohol, to what extent are European single market goals in tension with public health objectives, and with individual MS's ability to set their own alcohol policies and strategies? How can we ensure that policies are implemented that will reduce alcohol-related harms while minimising the costs to responsible drinkers and to the alcohol industry?

While this study cannot provide answers to these questions, it can inform a more focused, evidence-based debate on the use of pricing policies to reduce alcohol-related harms. Indeed, the study's findings that across the EU there is a positive relationship between alcohol affordability and consumption, and between alcohol consumption and certain types of alcohol-related harms, supports the inclusion of pricing policy in the centre of debates about alcohol and public health in the region. By examining current pricing policy and consulting experts and stakeholders, this study highlights some of the challenges of and opportunities for pricing policy.<sup>93</sup> Building primarily on the discussion on the previous chapter of this report, these challenges and opportunities are briefly described in what follows.

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<sup>93</sup> As part of this study, a workshop was organised whereby Europe-wide experts and stakeholders in the alcohol field discussed the implications of the study's findings for pricing policy (details of participants are provided in appendix B). The discussion and messages of this workshop aimed to inform the study team's enquiry on alcohol pricing policies in Europe, and fed into the development of this chapter.

## 8.1 Alcohol taxation

As detailed above, there is extensive evidence, built over decades of scientific research, that alcohol taxation can be an effective policy measures to curb harmful and hazardous alcohol consumption. However, as this study indicates, the real value of alcohol taxation, and of the minimum excise duty rates set by the EU, has decreased in most EU Member States. In many cases, this reduction has been attributed to downward pressures experienced by the expansion of the single European market and the replacement of travellers' quotas with indicative levels for personal use for cross-border purchases of alcohol, which were discussed in detail in Chapter 6. As our analysis of cross-border alcohol consumption indicates, certain EU-level priorities and regulations may undermine the ability of some Member States (most notably in Scandinavia) to set their own alcohol taxation within the context of their specific alcohol strategies.

It is not possible to develop specific recommendations on what the most appropriate level of alcohol taxation should be in individual MS in the absence of clear impact assessments and/or cost-benefit analyses of the effect of changes in taxation both on alcohol-related harm and on responsible drinkers and the alcohol industry. Nevertheless, the balance of research and our own enquiry into these issues do shed light on the necessary conditions for alcohol taxation to be an effective tool in reducing harmful and hazardous alcohol consumption.

First, alcohol excise duty rates should rise *at least* at the level of inflation and income growth. As previous chapters show, there has been erosion in the inflation-adjusted values of the taxes of alcoholic beverages, including in traditionally high-taxation countries such as Sweden and the UK. This significantly undermines the ability of alcohol taxation to act as an effective tool to reduce alcohol consumption and harms. Coupled with this erosion in the inflation-adjusted value of alcohol taxation is the fact that, as discussed in Chapter 3, incomes have gone up across the EU, compounding the effect of decreases in the real value of alcohol tax and making alcohol more affordable.

Second, as discussed in previous chapters (most notably Chapter 6 on cross-border alcohol consumption), most of the economic and social costs of alcohol tax differentials across the EU are currently born by high-taxation countries. This suggests that greater *upward* convergence on alcohol taxation across the EU (or lower indicative levels for personal use, discussed below) appears to be necessary to reduce disparities while at the same time reducing alcohol-related harms. However, market-driven convergence has led to a downward, rather than upward, trend in alcohol taxation (and prices). It is therefore possible that, in order to ensure higher and therefore more effective alcohol taxation, coordinated tax rates set at the EU level rather than the MS level may be an effective approach (Cnossen 2005). The feasibility and acceptability of this measure, however, remains doubtful.

Finally, it is possible that raising the EU minimum excise duty rates (which have not been adjusted since 1992) could increase alcohol taxation levels in many countries, as well as narrowing the tax and price differentials between countries and thus reducing the problems associated with cross-border alcohol purchases. While a strong public health case can be made in favour of this measure, it is doubtful, and possibly unlikely, that it would be

found feasible and acceptable, in particular given that unanimous agreement among all MS is necessary to introduce legislative changes in this field.

It is worth noting, however, that the implementation of substantial tax increases could present a number of challenges. Not only could substantial alcohol tax increases face significant opposition from different quarters (most notably the alcohol industry but also important sectors of the public). Tax increases could also contribute to the creation of an illegal market in alcoholic beverages (Kenkel 1996). A calculation of the optimal tax increase would have to take this into account.

#### Summary of key issues: alcohol taxation

- Alcohol excise duty rates should rise at least at the level of inflation and income growth
- Greater *upward* convergence on alcohol taxation across the EU appears to be necessary to reduce the problems relating to cross-border consumption – but the feasibility and acceptability of this measure remains doubtful
- Raising the EU minimum excise duty rates (not adjusted since 1992) could increase alcohol taxation levels in many countries, and narrow the tax and price differentials between countries, thus reducing the problems associated with cross-border alcohol purchases – but it is unlikely that agreement on this could be reached in the short term.

## 8.2 Minimum prices and bans on sales below cost

As mentioned in the previous chapter, policy-makers and public health advocates across the EU are increasingly interested in a minimum price for alcoholic beverages as a strategy to reduce harmful and hazardous alcohol consumption. While extensive evidence, discussed earlier in this report, suggests that raising the minimum prices of alcohol would be an effective policy to reduce alcohol consumption and harms (especially among young and heavy drinkers who are more likely than others to purchase cheaper drinks), there is much debate across the EU regarding the adequacy and acceptability of this measure, in particular given EU competition priorities and regulations.

Advocates of alcohol minimum prices argue that this approach can achieve health goals that taxation alone cannot reach. This is because a minimum price approach would circumvent the off-trade sector's ability to absorb increases in alcohol taxation, and to use deep discounting and below cost sales (e.g., SHAAP 2007). It is possible, however, that a minimum price regime would be considered trade-restrictive and not acceptable under EU law, as it would set an artificial floor price which could be considered problematic from an EU competition perspective. From an EU competition perspective, minimum pricing would probably only be acceptable if the measure were deemed proportional to the expected benefit (which in this case is primarily the gains that would be incurred from a reduction in alcohol consumption), or if there were other measures which are considered less trade-restrictive and which could achieve similar gains.

It can also be argued that minimum prices are a regressive policy measure, which would transfer welfare and any additional revenue to the alcohol industry and retailers (unlike taxes which lead to a transfer of additional revenue to public authorities that can be redistributed through public initiatives).<sup>94</sup> Finally, industry self-regulation is an unlikely option in this field, in particular given that anti-cartel laws may make industry-determined minimum prices illegal.

Given these concerns, it is possible that alternative regulations could be put in place that could go some way to achieving what minimum prices aim to do. One alternative could be a ban on sales below cost in the off- and on-trade (although sales below cost are particularly prevalent in the off-trade).

Bans on sale below cost are not considered trade-restrictive, which should enable MS to implement this policy without necessarily being in contravention of EU law. Equally, from a legal perspective, bans on sale below cost could be part of industry self-regulatory codes of practice, although they are not yet widespread in current self-regulation initiatives. In fact, bans on sales below cost are in place in many EU Member States, although their coverage varies widely from country to country; for example, the ban variously applies to all or some retail sectors, to particular products, to certain firms, and so forth (Commission of the European Communities 2008). Bans on sales below cost typically aim to deter predatory behaviour by large firms, which is understood to lead to smaller firms being driven out of the market. While there are indications that restrictions on sales below cost are not effective in protecting smaller firms (*ibid.*), their public health impact when applied to alcohol sales remains unexplored.

Bans of the sale below cost of alcoholic beverages in particular are not yet widespread across the EU, although they have been put in place in some countries such as Belgium. Given the feasibility of this as a measure to increase the price of the cheapest alcohol, there may be a role for the European Commission to provide legal and practical guidance and support to MS wishing to implement and enforce bans on sales below cost. Restrictions on alcohol sales below cost could also, potentially, be implemented through industry self-regulation.

**Summary of key issues: minimum prices and bans on sales below cost**

- Minimum prices could be effective in reducing harmful and hazardous drinking, especially among youth and heavy drinkers
- This measure could potentially be considered to be in contravention of EU competition regulations
- A possible effective alternative would be bans on sales below cost, which are not trade-restrictive
- There is legal scope for statutory and self-regulation in restricting alcohol sales below cost

<sup>94</sup> Russell Bennetts, personal communication, December 2008.



- The EC could have a role in providing legal and practical guidance and support to MS in the use of restrictions on sales below cost as an alcohol policy

### 8.3 Bans/restrictions on promotions

Various types of restrictions on alcohol sales promotions, including bans on promotions like “two for one” and “happy hour” are in place in a number of EU MS, such as Ireland, Scotland and Sweden. These can apply to either off- or on-trade alcohol sales, or to both. While there is limited robust research assessing the effectiveness of these measures, the balance of available research seems to indicate that initiatives that reduce the availability, or increase the price of alcoholic beverages can be effective in curbing hazardous alcohol consumption, especially among young drinkers.

While national policy in this area is possible, and in fact in place in many MS, there could be an important role for industry self-regulation with respect to alcohol price promotions, both in the on- and off-trade. Industry self-regulatory codes intended to reduce alcohol-related harms are a flexible and responsible approach to the problems associated with harmful and hazardous alcohol consumption. Indeed, companies and sectors across the EU already have industry-led agreements and codes of conduct in place to help reduce alcohol-related harms. Restrictions in alcohol price promotions have been variously part of industry self-regulation codes across Europe, and there is no indication that these codes are likely to be deemed to contravene European competition law.

However, it is worth noting that there is no scientific evidence regarding the effectiveness of non-statutory regulation (Anderson 2007). In fact, some evidence seems to suggest that self-regulation is subject to important weaknesses including patchy enforcement and lack of penalties for breaches (Meier *et al.* 2008). The case of the British Beer and Pub Association revoking its voluntary code banning alcohol sales promotions such as ‘two for one’ provides an illustration of one important limitation of the self-regulatory approach; it can be easily revoked and its sustainability cannot be guaranteed. While acknowledging that industry has an important role to play in enforcing restrictions and bans on alcohol price promotions, it is also important to note that self-regulation alone (at least in its current form) is unlikely to make an important contribution to reducing aggregate harmful and hazardous alcohol consumption. It is possible that improvements in the way self-regulatory codes are developed, implemented and monitored could increase their effectiveness. Potentially, there is scope for both governments and the European Commission to support self-regulation initiatives towards this aim.

#### Summary of key issues: bans and restrictions on sales promotions

- Some measures restricting sales promotions are already used in many EU MS
- Bans and restrictions on sales promotions in off- and on-trade can make a contribution to reducing harmful and hazardous drinking, especially among young drinkers
- Industry self-regulation is in place in many areas, and does not typically contravene European competition law

- However, self-regulation alone, in its current form, is unlikely to contribute to aggregate reductions in harmful and hazardous alcohol consumption
- More robust processes for the development, implementation and monitoring of self-regulation could, in theory, help improve their contribution to reducing alcohol-related harms.

#### 8.4 **Changes to indicative levels for personal use in cross-border alcohol shopping**

Indicative levels for personal use for cross-border alcohol purchases may not have a significant impact in those EU MS that do not experience high levels of cross-border shopping. However, as discussed in the Chapter 6, the substitution of indicative levels for personal use for the more restrictive travellers' quotas previously in place has contributed to an increase in alcohol consumption in two traditionally high-taxation MS: Finland and Sweden. There is also evidence that this increase was associated with an increase in alcohol-related harms, particularly in Finland. This occurred as a result of the combined effect of the higher quotas themselves, and the decrease in alcohol taxation in traditionally high-taxation countries to prevent significant fiscal revenue losses from increased purchases of alcohol abroad.

An unintended consequence of these outcomes of the revised regulation on cross-border alcohol purchases for personal use, therefore, is that they infringe upon the ability of individual MS to set their own alcohol policies on the basis of their own priorities and agendas. In particular, the traditionally high-taxation countries are subject to intense downward pressure on the level of alcohol taxation, reducing taxation's effectiveness as a tool to curb harmful and hazardous drinking.

What a feasible and acceptable response to these developments could be is unclear at this stage. One option would be another revision at the EU-level of the guidelines on what constitutes 'personal use' – that is, lower maximum quantities of alcohol as indicative levels for personal use. Lowering the amount of alcohol that travellers are allowed to move within the EU could potentially have the desired effect of reducing (but probably not completely eliminating) the negative outcomes of cross-border alcohol consumption. This reduction would (indirectly) increase the average cost of alcoholic beverages for intra-EU travellers (as the cost of the journey would be spread across a smaller quantity of alcohol); and given what this and many other studies show about consumers' responses to increases in price, a reduction of indicative levels for personal use – even if not to pre-1993 levels – could potentially lead to a reduction in alcohol harms. A downward revision of indicative levels for cross-border alcohol purchases for personal use may also have the indirect effect of (at least partially) restoring MS autonomy in setting alcohol taxation levels according to their own public health priorities.

Importantly, however, any such reduction would require an understanding of the quantities of alcohol that people currently transport across borders for personal use. This is because it is possible that most travellers do not actually import the full amount possible under the EU regulation. So for any reduction to have an impact, the revised guideline on

‘personal use’ would have to be lower than the average quantity of alcohol currently imported across EU borders (and the guideline’s enforcement would have to be effective).

It is important to note, however, that such a revision could be seen to undermine the EU’s priorities of reducing tax differentials between Member States and strengthening the single market, thus making this an unacceptable response to the issues around cross-border alcohol consumption.

**Key issues: indicative levels for personal use in cross-border alcohol shopping**

- Costs of high indicative levels for personal use in cross-border alcohol shopping borne by high-taxation countries
- High indicative levels indirectly infringe on MS’s ability to set their own alcohol taxation
- Revised guidelines on cross-border alcohol purchases for ‘personal use’ setting lower maximums would be relatively easy to implement and could reduce some of the harms experienced by ‘importing’ (traditionally high-taxation) countries
- Revisions would require an understanding of the quantities of alcohol that people currently transport across borders for personal use; for a reduction in maximum travellers’ quotas to have an impact, the revised guideline on ‘personal use’ would have to be lower than the average quantity of alcohol currently imported across EU borders.
- However, revisions to indicative levels are could be seen to undermine the EU’s priorities of reducing tax differentials between Member States and strengthening the single market, reducing their acceptability as a policy option.

## 8.5 Areas for further research

This study raises a host of questions that merit further examination. While we cannot list all of these, we shall comment briefly on what we consider to be the most policy relevant and urgent ones.

In spite of great interest in pricing as a possible policy lever to reduce alcohol-related harms, there is a dearth of research on the actual costs and benefits of different pricing policies. Much of the existing research has a somewhat one-sided approach, which is to interrogate the effectiveness (and occasionally the cost-effectiveness) of pricing policies (mostly taxation) in reducing harms. The limited cost-benefit analyses that are available focus on the balance between the costs of alcohol and the benefits of a particular policy. This, however, only gives a partial insight into their true outcomes.

As mentioned in various places throughout the report, there are not only costs but also some benefits associated with alcohol consumption. These include, but are not limited to, benefits in the form of job creation, revenues from trade and taxation, and even health benefits from the cardio-protective effects of alcohol at low levels of consumption (although these are still disputed). Benefits such as increased sociability and reduced stress that have been (mostly anecdotally) associated with alcohol consumption have not yet been

thoroughly investigated or measured, but deserve attention also. While there is a clear social perception that alcohol consumption has these kinds of benefits, not much research has been done in this area; i.e. there is an absence of evidence about this link, rather than evidence of absence.

Similarly, alcohol policies have costs and not only benefits. The implementation of policies themselves can be highly resource-intensive. They may also have implications for some of the beneficial elements of alcohol consumption. In order to fully understand the *net* costs and benefits of alcohol policies all of these should be taken into account in future research.

But the net costs and benefits from *individual* measures should not be the only area of interest in alcohol policy. There is an extensive body of research conducted over many decades on the effectiveness of individual policies – or, at most, combinations or a small set of them such as minimum legal drinking ages with zero BAC tolerance laws for under-age drivers. However, there is still very little understanding of what an optimal *mix of policies* would be.<sup>95</sup> We still do not fully understand how different interventions affect each other, and how to optimise their mix to obtain improved outcomes. A question, then, that merits further examination is: what is the composition of the most effective policy mix – that is, the policy mix that achieves the greatest reductions in alcohol harms?

## 8.6 Closing remarks

Increasingly, there has been growing concern in the EU about the public health implications of alcohol consumption. The Community's legal remit in the public health arena is limited, however, precluding the possibility of harmonization of alcohol policy across the EU (see Österberg and Karlsson 2003; Baumberg and Anderson 2008).

This chapter, however, suggests that there is an important role for MS and the EU in developing and adopting pricing policies that could contribute to a reduction in harmful and hazardous alcohol consumption. The role of economic operators in alcohol pricing measures, however, is less clear. This is primarily because of the nature of competition and profit interest. In addition, as mentioned above, while recognising that industry codes of conduct and agreements are important, there is little robust evidence that self-regulation (at least in its current form) is effective in helping to reduce harmful and hazardous alcohol consumption at the aggregate level.

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<sup>95</sup> Rabinovich *et al.* (2008).

As discussed in the introduction to this report, the persistence of alcohol-related harms in the EU (such as high rates of liver cirrhosis and traffic accidents and deaths) and the high social and economic costs of these, have led to growing public and policy interest in how to reduce them. While there is agreement among various sectors within the alcohol field (policy-makers, public health advocates and practitioners, the alcohol industry, and other groups) on the need to reduce alcohol-related harms, there is also debate about the implications of policies designed to curb harmful and hazardous drinking on those who drink alcohol responsibly and on the alcohol industry.

Decades of research have produced a very significant body of robust findings regarding the effectiveness of different alcohol policies. This study focussed on summarising current understanding and providing additional analysis relevant to the European situation that can help inform decision-making specifically around the *pricing* of alcoholic beverages. Although there are various other policy options, this study has focused only on pricing policies.

In order to do this, the preceding chapters examine the link between alcohol prices, affordability, consumption and harms in the EU, and provide a snapshot of some of the policy and legislative measures influencing alcohol prices at national and EU-level. Overall, our findings from the analysis of European data are consistent with the balance of research in the alcohol field demonstrating that the price of alcoholic beverages is negatively correlated with consumption, that income is positively correlated with consumption, and that alcohol consumption is positively correlated with the incidence of certain types of harms. That is, across the EU increases in the affordability of alcohol are associated with increases in its consumption, and increases in alcohol consumption tend to lead to increases in the incidence of alcohol harms, and vice versa. Interestingly, our analysis also indicates that alcoholic beverages have become more affordable over the past decade in virtually all the countries examined here.

The analysis also shows, however, that, as many other studies indicated before, overall alcohol consumption across the EU exhibits a decreasing trend. This overall trend hides important differences at Member State level; in many countries, overall alcohol consumption is actually going up. Nevertheless, at an aggregate EU level, the decreases in consumption outweigh the increases. While it is difficult to assess the extent to which different factors influenced this overall downward trend, research suggests that developments such as urbanisation, growing competition from non-alcoholic beverages, and more stringent alcohol policy may have played important roles. In any case, even with

this overall decrease in consumption of alcohol in Europe, alcohol-related harms are still deemed to be unacceptably high, and are therefore the focus on much public and policy attention.

The finding that overall alcohol consumption is decreasing at the same time as there is a positive relationship between affordability and consumption is *not* contradictory. Alcohol consumption and alcohol-related harms are multi-factorial issues; they are influenced by a large number of factors, which include but are not limited to how affordable alcoholic beverages are. As acknowledged throughout this report, and extensively examined in other research, macro-economic and social factors such as national development trends (e.g. urbanisation), competition from other types of beverages, and the nature and strictness of public policy influence levels of alcohol consumption and the incidence of harms in any given country. Equally, micro-level factors such as education socio-economic background, age and gender are also important influences.

These ‘unplanned’ (i.e. non-policy) social and economic changes may account for some of the upward trend in alcohol consumption in the Scandinavian countries, which have traditionally been considered the ‘gold standard’ in alcohol policy (with high taxation, production and retail monopolies, and other controls). Equally, as discussed elsewhere in this report, unplanned social and economic changes may also contribute to understanding the downward trend in alcohol consumption in southern European countries such as Spain and Italy, which have traditionally have much less strict alcohol control policies than their northern European counterparts. Analysis combining examinations of these two broad variables (policy and unplanned socio-economic developments) may help better explain alcohol consumption and alcohol-related harms than merely examining one or the other. It is important to note, however, that this kind of research is very complex.

Nevertheless, in the development of policies to address a public health concern such as harmful and hazardous alcohol consumption, understanding the influence of individual factors such as price or affordability can provide policy-makers with a variety of tools to achieve their aims. If, as this study indicates, the affordability of alcohol *does* impact on levels of harmful and hazardous alcohol consumption, then it makes sense for policy-makers to consider the appropriate policy levers available (in this case, measures affecting the price of alcohol, and therefore its affordability) to help curb this phenomenon.

As harmful and hazardous alcohol consumption *is* a multi-factorial problem, approaches to influence the price/affordability of alcohol are not the only elements of most countries’ alcohol strategies. Other policies have been shown to be effective in reducing harmful and hazardous alcohol consumption, such as reducing alcohol outlet density, increasing minimum legal drinking ages, and enforcing drink-driving counter-measures. An effective alcohol strategy is a policy mix that includes evidence-based interventions in all these fields.

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## **APPENDICES**

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## Appendix A: Excise duty tables

Table 9-1: Beer excise duty rates in EU 27, selected years

Member State	Excise duty on half a litre of 5% ABV/12.5 degree Plato beer (2008 Eurocents)			
	1996	2000	2004	2008
BE	11.73	12.89	11.99	10.69
BG			4.58	4.79
CZ			7.14	6.28
DK	27.51	27.32	25.35	17.06
DE	5.94	5.72	5.36	4.92
EE			11.22	12.30
EL	10.85	9.37	8.18	7.06
ES	6.67	6.29	5.84	5.69
FR	5.90	7.68	7.11	6.50
IE	71.86	64.37	55.56	49.68
IT	11.59	10.71	11.01	14.69
CY			13.35	11.95
LV			6.27	4.61
LT			6.34	5.58
LU	6.77	6.29	5.71	4.96
HU			13.82	14.34
MT			5.16	4.69
NL	14.06	12.99	13.54	12.56
AT	11.22	15.44	14.30	12.50
PL			14.17	12.79
PT	9.61	8.98	8.64	8.44
RO			10.10	4.31
SI			19.87	17.15
SK			11.73	10.35
FI	87.69	81.95	52.48	53.50
SE	39.06	45.30	41.87	43.82
UK	41.97	42.21	43.90	47.21

**Notes:** Data from 1996 is reported here as this is the earliest year for which we have EU-consistent measures of inflation. Data is reported only for Member States; thus, excise duty rates for countries which joined the EU in 2004 are only reported for the years subsequent to accession.

For purposes of comparability we assume that degrees Plato and % ABV are related by a ratio of 5:2; i.e. 12.5 degrees Plato = 5% ABV. The choice of ratio was based on historical beer data from <http://hbd.org/ensminger/beer-data-1999.pdf> and is in line with the EC directive for minimum excise duty, where a 5:2 ratio is implied. An additional simplification is made in this table - calculating the excise duty on a representative half litre of 5%ABV / 12.5 Degree Plato beer.

SOURCE: European Commission Directorate General Taxation and Customs Union.

**Table 9-2: Distilled spirits excise duty rates in EU 27, selected years**

Member State	Excise duty on a 70cl bottle of 40% ABV spirit (2008 Euros)			
	1996	2000	2004	2008
BE	5.66	5.61	5.22	4.91
BG			0.98	1.57
CZ			3.53	3.11
DK	*	12.17	6.16	5.63
DE	4.41	4.23	3.98	3.65
EE			3.31	3.61
EL	2.98	3.26	2.95	3.05
ES	2.19	2.51	2.39	2.32
FR	4.79	4.82	4.44	4.06
IE	11.23	10.02	12.29	10.99
IT	2.39**	2.21	2.27	2.24
CY			1.87	1.67
LV			3.16	2.50
LT			3.25	3.11
LU	3.98	3.71	3.36	2.92
HU			2.83	2.81
MT			7.22	6.44
NL	5.56	5.14	5.36	4.21
AT	2.51	3.32	3.08	2.80
PL			4.07	3.80
PT	2.92	2.91	2.80	2.74
RO			0.58	1.94
SI			2.25	1.95
SK			2.63	2.62
FI	17.33	16.20	8.54	9.10
SE	17.54	17.31	16.00	14.82
UK	8.59	8.04	7.64	7.55

\* in 1996, Denmark's excise duty on spirits included a fixed duty (6.85 €2008), + 37.5% of the pre-tax wholesale price

\*\* in 1996, Italy had two rates for spirits, depending on production method. The figure in the table represents the higher rate, which nominally remained closer to the consolidated rate later introduced.

**Notes:** Data from 1996 is reported here as this is the earliest year for which we have EU-consistent measures of inflation. Data is reported only for Member States; thus, excise duty rates for countries which joined the EU in 2004 in only reported for the years subsequent to accession.

SOURCE: European Commission Directorate General Taxation and Customs Union.

**Table 9-3: Intermediate products excise duty rates in EU 27, selected years**

Member State	Excise duty on a 70cl, 20%ABV Still Intermediate Product (2008 Euros)			
	1996	2000	2004	2008
BE	0.60	0.84	0.78	0.69
BG			0.44	0.32
CZ			0.78	0.69
DK	1.18	1.17	1.08	0.86
DE	0.43	1.24	1.17	1.07
EE			0.91	0.99
EL	0.44	0.40	0.36	0.32
ES	0.45	0.42	0.30	0.39
FR	1.85	1.77	1.64	1.50
IE	4.01	3.59	3.10	2.77
IT	0.46	0.42	0.44	0.48
CY			0.35	0.32
LV			1.01	0.70
LT			0.58	0.56
LU	0.64	0.60	0.54	0.47
HU			0.49	0.56
MT			0.36	0.33
NL	0.78	0.72	0.78	0.83
AT	0.44	0.60	0.56	0.51
PL			0.63	0.57
PT	0.44	0.42	0.41	0.40
RO			0.44	0.33
SI			0.51	0.44
SK			0.63	0.58
FI	7.22	5.67	3.20	3.27
SE	4.02	3.90	3.60	3.34
UK	2.03	2.12	2.13	2.29

**Notes:** Data from 1996 is reported here as this is the earliest year for which we have EU-consistent measures of inflation. Data is reported only for Member States; thus, excise duty rates for countries which joined the EU in 2004 in only reported for the years subsequent to accession.

SOURCE: European Commission Directorate General Taxation and Customs Union

**Table 9-4: Still wine excise duty rates in EU 27, selected years**

Member State	Excise duty per 750ml bottle, 12% ABV (2008 Eurocents)			
	1996	2000	2004	2008
BE	35.09	42.62	39.62	35.32
BG			0.00	0.00
CZ			0.00	0.00
DK	84.00	83.57	77.53	61.75
DE	0.00	0.00	0.00	0.00
EE			63.66	49.85
EL	0.00	0.00	0.00	0.00
ES	0.00	0.00	0.00	0.00
FR	3.12	2.98	2.79	2.55
IE	296.22	263.34	229.01	204.75
IT	0.00	0.00	0.00	0.00
CY			0.00	0.00
LV			46.22	31.93
LT			40.76	39.10
LU	0.00	0.00	0.00	0.00
HU			3.16	0.00
MT			0.00	0.00
NL	48.33	44.65	47.74	51.41
AT	0.00	0.00	0.00	0.00
PL			33.70	30.44
PT	0.00	0.00	0.00	0.00
RO			0.00	0.00
SI			0.00	0.00
SK			0.00	0.00
FI	216.65	202.48	171.59	174.75
SE	259.63	251.46	188.67	170.90
UK	179.64	170.00	171.02	183.92

**Notes:** Data from 1996 is reported here as this is the earliest year for which we have EU-consistent measures of inflation. Data is reported only for Member States; thus, excise duty rates for countries which joined the EU in 2004 in only reported for the years subsequent to accession.

SOURCE: European Commission Directorate General Taxation and Customs Union

**Table 9-5: Sparkling wine excise duty rates in EU 27, selected years**

Member State	Excise duty per 750ml bottle, 12% ABV (2008 Eurocents)			
	1996	2000	2004	2008
BE	122.84	145.80	135.54	120.85
BG			0.00	0.00
CZ			83.53	0.00
DK	126.32	125.06	116.03	92.52
DE	123.19	118.12	111.25	102.00
EE			63.66	49.85
EL	0.00	0.00	0.00	0.00
ES	0.00	0.00	0.00	0.00
FR	7.76	7.42	6.89	6.30
IE	592.36	530.66	458.03	409.51
IT	0.00	0.00	0.00	0.00
CY			0.00	0.00
LV			46.22	31.93
LT			40.76	39.10
LU	0.00	0.00	0.00	0.00
HU			36.02	38.87
MT			0.00	0.00
NL	164.78	752.23	162.77	175.28
AT	134.65	128.82	118.78	0.00
PL			33.70	30.44
PT	0.00	0.00	0.00	0.00
RO			43.54	23.54
SI			0.00	0.00
SK			67.55	59.59
FI	263.08	202.48	171.59	174.75
SE	259.63	251.46	188.67	170.90
UK	233.49	242.87	230.72	235.58

**Notes:** Data from 1996 is reported here as this is the earliest year for which we have EU-consistent measures of inflation. Data is reported only for Member States; thus, excise duty rates for countries which joined the EU in 2004 in only reported for the years subsequent to accession.

SOURCE: European Commission Directorate General Taxation and Customs Union





## Appendix B: Workshop participants

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The workshop was held in Brussels on 11 November 2008. Participants were selected and invited by the European Commission, in consultation with RAND Europe. In addition to the RAND Europe study team and the European Commission project Steering Committee, the workshop participants were:

### **Committee on National Alcohol Policy and Action**

- Crispin Acton (UK)
- Vesna-Kerstin Petric (Slovenia)
- Maria Renström (Sweden)

### **European Alcohol and Health Forum**

- Nathalie Rodriguez (APYN)
- Petra Meier (University of Sheffield)
- Hugo Byrnes (EuroCommerce)
- Gregor Zwiern (European Forum for Responsible Drinking)
- Martin Rees (DLA Piper)
- Nick Sheron (University of Southampton)

### **European Alcohol and Health Forum Science Group**

- Katrin Lang
- Marjana Martinic
- Alicia Rodriguez-Martos
- Anders Rommelsjö

### **Other**

- Ben Baumberg (London School of Economics)