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ECONOMICS

# **Review of Rand Europe’s “The affordability of alcoholic beverages in the European Union”**

March 2009

*This review was requested by The Brewers of Europe*

## EXECUTIVE SUMMARY

This report evaluates Rand Europe's publication "The affordability of alcoholic beverages in the European Union".

### The main points are:

General:

- The report does not take an independent unbiased approach to evaluating the link between alcohol affordability, consumption and harm. It focuses heavily on the literature which is supportive of a link between alcohol taxes, consumption and alcohol-related harms. It ignores or gives little time to any study that suggests there is no link or it is weak. A more balanced evaluation would have been a more useful contribution to the debate.
- The report makes many assertions that cannot be substantiated.

On methodology are:

- The paper argues there is a positive relationship between alcohol consumption and three types of harms, namely traffic injuries, traffic deaths and liver cirrhosis. However, there are problems with the data and methodology used.
  1. The report does not have data on the number of alcohol-related traffic accidents/deaths in each member state. Instead it uses data on all traffic accidents/deaths. It is difficult to see how traffic accidents/deaths in which neither party had been drinking can be explained by changes in national alcohol consumption. Similarly, the data used on liver cirrhosis is from all causes.
  2. The clinical evidence suggests liver cirrhosis can be brought about by long-term excessive alcohol consumption. Yet the regression analysis tries to explain the annual change in the incidence of liver cirrhosis by the annual change in alcohol consumption in the same year.
  3. The regression analysis is too simple. It tries to explain the annual change in the incidence of a harm in a member state by the annual change in its alcohol consumption. In practice, many other factors will play a role. For example, the number of traffic accidents is likely to be a function of population size, the average speed at which cars drive, the level of driving tuition required to pass the driving test and many other factors.
- The affordability index used in the paper is constructed using the change in real disposable income of the entire population in each member state. Ideally, it should be calculated with real disposable income per capita of those who do and potentially may drink. Changes in population due to migration or income growth of those who never drink will distort the index.

### Interpretation of the academic literature

- The consensus in the academic evidence is that heavy drinkers' demand for alcohol is very price insensitive, particularly when compared to the rest of consumers. Some studies (for example Manning et al (1995)) find the heaviest 5% of drinkers have a price elasticity not significantly different from zero. If so, any form of price based policy will not affect those it is targeting. Instead, it will hit the rest of the consumers who enjoy alcoholic drinks responsibly, which in turn will affect an important industry.
- The report cites evidence (Gallet (2007)) that young drinkers' demand for alcohol is less price sensitive than older drinkers. Again, raising alcohol prices will affect older drinkers demand far more than the group the policy is designed to affect.
- The report presents data on average real alcohol excise duty in the EU between 1996 and 2006. When the EU members duty rates are weighted by countries' consumption of alcohol, the real duty rate price has not fallen much, if at all. This isn't reflected in the claims about the falling rate of the real value of excise duty in the EU.
- The report makes a very limited effort to quantify the benefits of the alcohol industry.

## Chapter 1: Introduction

This chapter (and the whole paper) contains statements that are very bold and not supported by any evidence. For example: "a significant proportion of alcohol consumption is problematic and generates harms for individuals and societies". If there was robust evidence behind this statement we would expect it to read 'around X% of alcohol consumption has been shown to cause...'

On page 2, the paper states "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". No evidence is provided to support this and what is the relevant comparator? When you buy alcohol you pay VAT and excise duty. Excise duty is not charged on virtually all goods other than alcohol, petrol and tobacco. Similarly, VAT is not charged on some goods.

The costs versus benefits figures of alcohol production/consumption that Rand quote are clearly NOT comparable. The economic benefits figure Rand quote is just a figure for exports – which is only a subset of the economic benefit of alcohol production and distribution. Rand should also measure:

- the economic impact of alcohol produced and sold in the same country.
- the economic activity alcohol production generates in its' supply chain and through induced effects from its staff and those directly employed in its supply chains consumer spending out of their wages.
- the economic activity and jobs created by the retailing of alcohol in the on-trade and off-trade.
- metrics such as consumer surplus. This is the benefit drinkers gain from drinking in excess of what they have paid for the product.

In short, the paper has made a very weak and inappropriate effort to quantify the economic benefits the alcohol industry produces. There are many economic impact studies on drink production (for example, the Ernst & Young study conducted in 2006 for The Brewers of Europe), why haven't these been used to quantify the benefits of the industry better?

There is considerable debate in the field of economics about the appropriate values to use when assessing social cost. No information is given about how DG SANCO came up with the figure of around €125 billion in costs of alcohol misuse in the EU in 2003. Any estimate must be subject to considerable uncertainty.

## Chapter 2: The price of alcohol

The chapter opens with a list of factors that are supposed to determine the retail price of alcohol. A minor point is that producer's willingness to supply any product (including alcoholic drinks) is partly a function of their costs. So why do we need the first two bullets and then the mention of supply?

The study talks about over pass through of tax changes to prices (this occurs when price increases by more than the initial rise in tax). Our reading of this literature is that there is no consensus. Depending on the market structure (i.e. how competitive it is), you can find numerous studies that support under pass-through, full- pass through or over pass-through. The authors are being a bit selective in only citing the ones which find over-pass through (also known as over-shifting).

There are no details of Rand's own analysis of how changes in excise duty affect price on page 9. Rand should be more transparent about how they have generated these results if they want to cite them.

The weighted lines in Charts 2-9 to 2-11 on page 17-18 show for the most part real alcohol duty has remained broadly unchanged between 1996 and 2006. So across Europe as a whole, the drinker has not faced a fall in the real excise duties they pay.

Second paragraph of Section 2.5 on page 20, again the claims here that "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 related harms" are unsubstantiated.

### **Chapter 3: Affordability of alcoholic beverages in the EU**

The construction of the affordability index is liable to lead to misleading results. The numerator is real disposable income of the entire population. It is therefore sensitive to changes in population, as well as income. Over time most countries population grows. For countries in Western Europe that have seen significant immigration, real disposable income will rise very significantly because of the higher population, but this says nothing about each individual's disposable income levels. The affordability index should use real disposable income per person as the numerator.

This has been a big issue in the UK and presumably other Western European countries that have benefited from significant immigration from Eastern Europe (or elsewhere). If you look at real disposable income in total (as the author's affordability index would) it shows a substantive rise. If you look at it per person, the rise is significantly less impressive.

Ideally, we would also want to use the real disposable income per capita of those who do and potentially might drink. Someone who will never drinks income should be excluded. This would suggest the estimation may be better done on data on large scale surveys of individuals consumption and income patterns (where it is possible to identify whether they drink or not). But this data may not be available for many states.

The use of the example of the Netherlands on page 23 is odd. Firstly, why are developments in the Netherlands economy liable to be representative of those elsewhere in Europe, particularly those outside the Euro-zone. Second, falls in real household disposable income are rare, only occurring in recessions (due to rising unemployment and slowing earnings growth). I don't believe the Netherlands real disposable income index fell for three consecutive years between 2002 and 2005 in Figure 3-1 as

their economy did not enter a prolonged recession.

Page 26 – the connection between consumption and harms is made without being substantiated. Alcoholic drinks are regarded as entirely negative, not something that gives pleasure to millions throughout Europe, without any problems if consumed in moderation.

## Chapter 4: Consumption

Over time, we expect the affordability of most goods to increase. People's standard of living generally rises across most countries in most years. As the authors admit, affordability is not really therefore the explanation for shifts in consumption between drinks or the overall fall in consumption of alcohol per capita.

The income elasticity of beer is normally found to be very small (0.39) – page 35. For on-trade beer, it is even sometimes found to be negative – this means some people switch away from drinking beer in pubs and bars as they become more affluent. Any argument about increased affordability leading to higher consumption is therefore less true for beer, relative to the other drinks which have higher income elasticities.

Perhaps the most important criticism of the whole paper is that Rand give little attention to the general results that problem drinkers are far less price sensitive than the rest of the population. A recent University of Sheffield study<sup>1</sup> commissioned by the Department of Health in the UK states:

“Some evidence exists in the literature to suggest that heavier drinkers are less responsive to price increases (in relative terms) than lighter drinkers. Manning et al (1995)<sup>2</sup> derived a price elasticity response function with respect to drinking quantile, indicating that moderate drinkers are the most price elastic and that the 95<sup>th</sup> percentile of drinkers have an elasticity not significantly different from zero (perfect price elasticity). Wagenaar et al (2008)<sup>3</sup> meta-analysis computes a mean elasticity of -0.28 for heavy drinkers compared to the overall -0.51 described earlier. By contrast, our elasticity estimates for moderate, hazardous and harmful drinkers (Table 12, Table 15 and Table 16 respectively) show, in general, own-price elasticity magnitudes increasing with mean quantity of alcohol consumed. However the relationship we observe between overall price elasticity and level of drinking is more complex due to the inclusion of cross-elasticities, with hazardous drinkers showing the greatest level of substitution behaviour, which in some cases is an order of magnitude greater than that estimated for moderate

<sup>1</sup> University of Sheffield (2008), 'Modelling alcohol pricing and promotion effects on consumption and harm'. The quotation is lifted from page 51.

<sup>2</sup> Manning, W.G., Blumberg, L., Moulton, L.H (1995). The demand for alcohol: The differential response to price, *Journal of Health Economics* 14:123-148.

<sup>3</sup> Wagenaar, A.C, Salois, M.J., Komro, K.A (2008). Effects of Beverage Alcohol Taxes and Prices on Consumption: A Systematic Review and Meta-analysis of 1003 Estimates from 112 Studies. Presented at the 34th Annual Alcohol Epidemiology Symposium of the Kettil Bruun Society for Social and Epidemiological Research on Alcohol Victoria, British Columbia June 2-6, 2008.

drinkers.

To enable more direct comparability with the estimates in the literature we have also generated elasticity estimates for total alcohol purchasing from the EFS, shown in Table 11. These are in broad agreement with the literature, showing that – at the highest level of aggregation – hazardous and harmful drinkers (combined elasticity of -0.21) are less price elastic than moderate drinkers (elasticity of -0.47).”

This means that problem drinkers demand for alcohol is far less responsive to price rises than the average social drinker. So any excise duty increase will hit the vast majority of drinkers’ consumption, far more than problem drinkers.

On page 33, Rand cite a study by Wagenaar et al (2008). The authors use of this (and other) studies is very selective. Rand point out that Wagenaar et al (2008) find “statistically overwhelming evidence of effects of alcohol pricing on drinking”. However, the very same study computes a mean own-price elasticity of -0.28 for heavy drinkers compared to the overall -0.51 for all drinkers. This they do not mention. The study would come across as more objective, if the authors presented results on both sides of the debate and then drew their conclusions.

The Gallet (2007) result Rand cite also contradicts Rand’s main argument. By showing young drinkers are less sensitive to price than older people, it suggest that if you try to increase the price of alcohol to stop young drinkers consuming, you will have a disproportionately larger impact on older people. Presumably, these older people are just enjoying alcohol sensibly, so why should they be hit hardest by a policy aimed at youth drinking. Makela, Bloomfield, Gustafsson, Huhtanen and Room (2007) also find evidence of the old being more price sensitive than the young in Scandinavia.

The regression analysis is over a short time horizon, which makes it less convincing. The omission of a constant also means the equation will have specification problems.

## Chapter 5 - Harms

The paper argues there is a positive relationship between alcohol consumption and three types of harms, namely traffic injuries, traffic deaths and liver cirrhosis. However, the presented evidence on harm trends in the EU is misleading.

On page 46 the report states that “This geographical variation in liver cirrhosis trends is broadly similar to the geographical variation in alcohol consumption trends described in the previous section”. The word broad must be taken in its widest sense; the data clearly shows that there are member state countries where consumption of alcohol is increasing yet liver cirrhosis deaths are decreasing (e.g. Luxembourg, Czech Republic and SE) and countries where alcohol consumption is decreasing yet deaths from liver cirrhosis is increasing (e.g. Poland and Hungary). The differences in the trends between alcohol consumption and harm at member state level weakens the argument that there is a clear link between consumption and harm. In any event, there are issues with the data that underpins

their analysis. Firstly, there are different comparator years: the death data is 1990-2003, while consumption is 1985-2003. Secondly, the consumption data is based on total litres of alcohol consumption. This needs to be translated in to consumption of pure alcohol – (the analysis as presented suggests that a litre of 4% beer has the same impact on liver cirrhosis as a litre of 40% ABV spirits). Not to mention the fact that alcohol is not the only cause of liver cirrhosis (eg hepatitis) so not all the cirrhosis cases can be put down entirely to alcohol.

This evidence presented in Section 5.2 is somewhat confusing and contradictory. The report states that “ 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)”.

That statement shows that harm is not automatically reduced by decreasing a population’s overall consumption. Rather the focus should be the improvement of the drinking patterns of those who drink inappropriately. The evidence presented in section 5.2 makes no distinction between reducing consumption and reducing harm, and does not make reference between affordability’s influence on harm (rather than total consumption) which is what the study is seeking to address.

No evidence is presented that answers the question as to how affordability influences the patterns of drinking that are not explained by aggregated national consumption.

The report touches on the price elasticity of demand of problem drinkers. It argues heavy drinkers do modify their alcohol consumption when prices change. Rand use this statement to imply that increasing the price of alcohol will reduce affordability and so reduce consumption of heavy drinkers. As discussed above and in the paper, the reported elasticities of heavy drinkers shows a very weak relationship between price and consumption – accordingly it would require a very significant increase in prices to lower consumption by heavy drinkers to a non-harmful level of consumption. This extreme rise would obviously then hugely impact on the rights of moderate consumers.

The paper argues there is a positive relationship between alcohol consumption and three types of harms, namely traffic injuries, traffic deaths and liver cirrhosis;

There are issues with their analysis.

- Data constraints. Rand do not explore the relationship between affordability and harms directly. Instead, Rand report the findings of data analysis of the relationship between alcohol consumption and harm and then draw on existing literature to discuss the direct link between these two variables.
- The traffic injuries (and deaths) data includes alcohol and also non-alcohol related traffic accidents and deaths. Their logic for 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 nonetheless have been caused by them. The use of the word ‘may’ completely undermines their analysis. In effect Rand are using alcohol consumption to explain something that may not in fact be related to alcohol consumption at all! This conclusion should be dropped from the report.

- All Rand are estimating in this simple single equation model is alcohol consumption and traffic accidents – getting a statistical negative relationship and then assuming that alcohol consumption was the cause of the accident or death.
- The data may be picking up age-cohort impacts – per capita alcohol consumption increases may be driven by an increasing share of the population aged 16+. An increase in the population aged 16+ would likely increase the number of potential vehicle drivers on the road which in turn could be the cause of the increase in traffic injuries (and deaths), not alcohol consumption per se.
- The paper does not attempt to model country level drink-driving laws.
- The regression analysis is very simplistic. It only explains harm with one variable which is alcohol consumption. The real world is far more complex. Why have Rand not included other variables before drawing such a firm conclusion, particularly as it is one of their main findings – at best the word “tentative” should be added to all their statistical conclusions. – in fact Rand themselves mention “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)”. Rand then mention on page 57 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”.

The cirrhosis data used in the regression is for all causes of cirrhosis.

The cirrhosis and homicide regression estimates (results in Table 5-2) on page 56 have very little explanatory power. As the paper states – they “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).” What this means is that their model is able to explain less than 10% of cirrhosis and homicides.

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

The discussion of the UK versus France case study is not convincing. The paper draws conclusions from looking at differences in consumption patterns between the South East of England, which is a key UK gateway to France, and in other UK regions.

There are a number of issues with this:

- Having stated that “Binge-drinking has been identified as the main driver of harmful alcohol consumption in the UK” on page 75, the paper then states that the South East is dominated by

middle-income households who are “more likely to drink more frequently and to drink above the daily recommendations” than lower income households, but they are less likely to binge-drink. Binge drinking is more prevalent in the North East, North West and Yorkshire and Humberside.

- It then states that the South East of England has a lower percentage than the national average of alcohol related crime offences and sexual violence, and is at the national average of negative or refused breath tests for drink-driving offences.
- The report then tries to link frequent drinking with alcohol specific mortality, but these are in fact lower in the South East than the national average, so instead it states that the region is amongst the four regions that exceed the national average of incapacity benefit and severe disablement allowance claimants with a main diagnosis of alcoholism. However, it is unclear the direction of causality – did the severe disablement lead to alcoholism.
- The report states the high alcohol-specific hospital admission rates of the local authorities bordering the Channel Tunnel and cross-Channel ferry ports – compared to the other local authorities in the region. But there is not enough evidence to establish a definitive relationship between the two. It states that 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). It “could be” is weak (it could equally read “could not”). And later it states that 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.

Makela, Bloomfield, Gustafsson, Huhtanen and Room (2007)<sup>4</sup> investigate the short term changes in alcohol consumption by sub groups of the population in Denmark, Finland, and southern Sweden following large-scale decreases in alcohol taxation in Denmark and Finland and large increases in travellers’ allowances in Finland and Sweden. They find no evidence that there was an increase in alcohol consumption after the changes in taxes (compared to the control site) in any of the countries or subgroups of the population.

## Chapter 7: EU and national legislation affecting alcohol pricing

Much of the discussion in this chapter is based on the principle of price rises lower alcohol harms. However, clearly different segments of society are more or less likely to suffer from alcohol harms (for example, the very heavy drinkers) and the key is about the price elasticity of these different segments of consumers. As discussed above, the consensus in the academic evidence (which is not quoted in the paper) shows that those who drink excessively have a very low price elasticity.

<sup>4</sup> Makela, P, Bloomfield, K, Gustafsson, NP, Huhtanen, P and Room, R, (2007), ‘Changes in volume of drinking after changes in alcohol taxes and travellers’ allowances: results from a panel study’, *Addiction*, Vol. 103, pages 181-91.

## Chapter 8: Implications for alcohol pricing policy

Once again the statements in this chapter often hang on the proof of a relationship between price increases and a reduction in alcohol harms – we do not believe this has been proved.

On page 94, the study talks about the results from 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.” We disagree with their reading of the literature. The consensus as we read it is that demand from problem drinkers is very unresponsive to price changes. Please see the quotation from the University of Sheffield study for the Department of Health in the UK on pages 6 and 7 of this report. If true, you cannot stop problem drinking and harms by price measure. Moreover, you would massively affect the alcoholic drinks industry and the rest of its customers (who are more price responsive).

The paper states “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” on page 94. From our perspective, the literature shows problem drinkers are very price unresponsive. If responsive, at all. The policy is therefore unlikely to be effective and hit the rest of the population which is price responsive.

There appears to be some bias in some findings. For example, to help eliminate cross-border consumption requires equalization of tax rates, but this does not means they have to converge on the current highest rate. If it does mean this, it is not fully explained why convergence at a low tax level would not remove incentives for cross-border trade.

On page 100, the report comments “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”. We would argue the evidence to say tax rises will reduce harmful and hazardous alcohol consumption is weak, because of the price elasticity point raised above.

## Chapter 9: Final remarks

To re-iterate, the paper’s analysis about price-based measures depends on what you believe the price elasticity of alcoholic drinks to be and in particular, whether those drinkers who are likely to harm themselves or others are price responsive. We would argue the academic evidence (as mentioned in the University of Sheffield study for the Department of Health) shows that the heaviest drinkers have the lowest price elasticity. This would suggest that a rise in price would reduce consumption for those moderate drinkers and would not impact as much on heavy drinkers. Given this, it is likely to have a limited impact on alcohol harm. Robust econometric analysis by socio-economic type would be required before you could start to draw the type of conclusions they are making. If this premise is not robustly proven the recommendations and conclusions made on the basis of this being a fact would no

longer hold.

The paper discusses some reasons why the relationship that shows high tax countries have had increasing consumption while lower tax countries have had falling consumption and conclude that you can't assume that there is a positive relationship between price and consumption as the issue is complex – this is true - just as you can't conclude without robust evidence as to the relationship between alcohol consumption and alcohol harms.

The report completely excludes any analysis on the benefits that alcohol production and consumption brings.