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TECHNICAL
REPORT

Preliminary assessment of economic impacts of alcohol pricing policy options in the UK

Priscillia Hunt, Lila Rabinovich, Ben Baumberg

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Preface

The UK Home Department (Home Office) has general responsibility to inform Government on the state of alcohol-related crime in England and Wales and to consider policies to reduce alcohol-related harms. The Home Office states, "[t]he links between alcohol and violence are well established. But we are determined to rid our streets of this serious problem".[1]

In an effort to understand the economic implications associated with various possible measures to tackle alcohol harms, the Home Office commissioned RAND Europe to undertake research into three particular policies – minimum pricing, ban on below-cost sales, and taxation. This study starts by presenting the evidence on the links between alcohol prices and consumption, followed by a chapter on the literature examining the economic impacts of the three policies under consideration. We then present the statistical data describing the market for alcohol in the UK. Lastly, using the literature and findings from interviews with key stakeholders, we explain the relationship between actors in the UK alcohol market, such as producers, retailers and consumers, and discuss how these actors may respond to the proposed policies. The report concludes with a discussion on knowledge gaps.

This report was produced with funding support from the Home Office. The report will be of interest to government officials dealing with alcohol issues and will contribute to the UK Government's policy- and decisionmaking to address alcohol-related harms.

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[1] http://www.homeoffice.gov.uk/crime-victims/reducing-crime/alcohol-related-crime/

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Abbreviations

ABV	Alcohol by Volume
BBPA	British Beer and Pub Association
BoE	Bank of England
CC	Competition Commission
CPI	Consumer Price Index
CPIY	Consumer Price Index, excluding indirect taxes
EU	European Union
FTE	Full-time equivalent
GBP	Great Britain pounds
GDP	Gross Domestic Product
GVA	Gross value added
HMRC	Her Majesty's Revenue and Customs
MMC	Monopolies and Mergers Commission
MUP	Minimum unit pricing
NHS	National Health Service
NAO	National Audit Office
REA	Rapid evidence assessment
RPI	Retail Price Index
RTD	Ready-to-drink
R&D	Research and Development
UK	United Kingdom
US	United States
VAT	Value added tax
WHO	World Health Organization
WSTA	Wine and Spirits Trade Association

Executive summary

Introduction

Alcohol has an important economic and socio-cultural place in the UK. It creates jobs, generates fiscal revenues in the form of alcohol taxes, and contributed around £2.7 billion[2] in 2007 to the economy through trade (ONS, 2007b). Alcohol is shared in social interactions, and is drunk as an accompaniment to meals. While alcohol has been, and continues to be, consumed in an unproblematic way by many people, a proportion of alcohol consumption is problematic and generates harms for individuals and society.

Alcohol misuse is high in the UK policy agenda. According to data from the World Health Organization (WHO), alcohol consumption in the UK increased by approximately 4 percent between 1985 and 2003, whereas it decreased over the same period for most other European Union countries (Rabinovich *et al.*, 2009). At the same time, some alcohol-related harms have grown over this period; for example, there were 8,758 deaths from alcohol-related causes in the UK in 2006, twice as many as there were 15 years before (National Audit Office, 2008).

While there is a large body of literature focusing on the variety and extent of the public health and criminal justice impacts of alcohol use, its *economic* impact has received relatively less attention. In order to help Government assess the full range of implications from proposed alcohol pricing policies, RAND Europe has undertaken this study to provide evidence in the area of potential economic impacts of the following three pricing policy options: minimum pricing, ban on below-cost sales, and taxation.

Approach

Through qualitative and quantitative methods, this report provides a preliminary assessment of the potential economic impacts of three pricing policy options to increase the price of alcohol. These are minimum pricing, increases in taxation, and a ban on below-cost sales. In order to conduct this preliminary assessment, we:

- review existing literature on the three policy options
- present statistics and relevant economic literature on the UK market for alcohol, and

[2] In terms of gross value added (GVA), which is the difference between the value of goods and services produced and the cost of raw materials and other inputs used in production.

- conduct interviews with representatives of the alcohol industry and business and economic academics to understand the industrial relations and product development aspects in the UK alcohol market.

Based on the above, this report discusses the potential impacts that the three pricing options may have on consumers, producers, the on- and off-trade retail sectors, and government.

Main findings

The main findings from this study are presented for each pricing policy below. The literature on the pricing policies has grown substantially over the past decades, particularly for taxation policy. There is a great deal of available data to describe the UK market for alcohol and interviews provided interesting insights into the actual operations in alcohol market.

On the other hand, there are some limitations to our findings. Literature on the economic impacts of the different alcohol pricing policies remains surprisingly scarce, despite the passionate debate about the potential winners and losers from these measures. Furthermore, the complexity of the alcohol supply-chain and the long-run implications of the pricing policies are inadequately researched and there are therefore many uncertainties regarding effects in the longer-term. Consequently, the main findings presented in this report should be interpreted with caution.

Economic implications of minimum pricing

Unlike taxation, minimum pricing circumvents retailers' ability to absorb price increases, so all alcohol currently sold below the minimum price per unit would become more expensive with the introduction of this policy. The full effect of the policy of course depends on the minimum pricing introduced; for instance, a minimum price of £0.30 per unit of alcohol is unlikely to change much as most alcoholic beverages (other than cider) are already priced above £0.30 per unit.

Since the price effect of this policy is especially strong for low-cost alcohol, minimum pricing has important implications for young and hazardous/harmful drinkers and low-income groups, who are more likely to purchase cheaper drinks.

Due to the already higher prices charged, minimum pricing is likely to affect prices in the on-trade less than other retailers. In fact, on-licence may benefit from increased trade as the relative prices of on- to off-trade premises are reduced, and some consumption switches from the off- to the on-trade. Nevertheless, minimum pricing could have a positive impact on other off-trade retailers' revenues as well. The direct costs to producers and retailers of implementing this regulation are likely to be relatively small.

Lastly, government generates no revenue from a minimum price policy.

Economic implications of a ban on sales below cost

The size of the impact of a ban on sales below cost depends on the extent to which retailers engage in this pricing strategy. There is evidence that sales below cost are particularly common in the UK in the supermarket sector, and specifically during times of high demand (such as Christmas and the hotter month of July). It is also possible that retailers (especially large supermarket chains) would lower alcohol prices further in order to

circumvent a ban on below cost sales. The effect on consumption of a ban on sales below cost, therefore, may be relatively small compared with broader restrictions on discounts and promotions, and also with the introduction of certain minimum prices or tax hikes. Nevertheless, even if the effect is small, where it increases the price of the cheapest drinks, the ban could potentially lead to some reduction in hazardous/harmful drinking.

An important issue regarding sales below cost bans is the definition of cost adopted for this policy. If cost is defined as VAT + excise duty, the implementation and compliance costs of the policy are relatively small as VAT + excise duty are a transparent and easily identifiable cost. Another definition of costs (such as the true cost of production of the product) would make this policy much more difficult to implement due to the fact that many of these costs vary significantly across products, producers and even times of the year.

As in the case of minimum pricing, the ban would not generate revenue for government.

Economic implications of increases in alcohol excise duty rates

For the most part, the on-trade sector in the UK appears to pass tax increases on to consumers at least at the level of the tax increase, whereas the off-trade (in particular larger retailers such as supermarkets) appears to be more able to absorb these increases, leading to little or no change in the price faced by consumers.

When they are passed on, taxes affect all drinkers, who either pay more to consume the same amount, reduce the amount they drink, or substitute for cheaper beverages or other products. This is why taxation has been considered a 'blunt instrument' that does not target those drinkers who cause harms, instead affecting all consumers to some extent.

An important aspect of taxation is that, unlike with the two other pricing policies examined here, the government obtains additional revenues from tax increases.

Future research directions

A key element of the economic assessment is to understand what will be the actual, final prices to consumers in each of the policies. This means taking into account the inter-dependent, dynamic relationships between actors in the alcohol market and, thus, an important avenue of research would be to estimate the long-run prices of alcohol.

The way in which alcohol reaches retailer shelves and on-trade menus deserves further scrutiny. There may be constraints and incentives in the system that will be important to consider for the long-run, economic sustainability of all actors, such as wholesalers.

A significant research gap exists in the UK on the substitutes and complements to alcohol. This is an important element of an economic impact assessment, as price increases in alcohol may have the unintended consequence of leading to growth or decline in other commodity markets, such as cannabis or tobacco.

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CHAPTER 1 Introduction

1.1 Background

Alcohol has an important economic and socio-cultural place in the UK. It creates jobs, generates fiscal revenues in the form of alcohol taxes, and contributed around £2.7 billion[3] in 2007 to the economy through trade (ONS, 2007b). Alcohol is shared in social interactions, and is drunk as an accompaniment to meals. While alcohol has been, and continues to be, consumed in an unproblematic way by many people, a proportion of alcohol consumption is problematic and generates harms for individuals and society.

1.2 What is the problem?

Alcohol misuse is high in the UK policy agenda. According to data from the World Health Organization (WHO), alcohol consumption in the UK increased by approximately 4 percent between 1985 and 2003, whereas it decreased over the same period for most other European Union countries (Rabinovich *et al.*, 2009). At the same time, some alcohol-related harms have grown over this period; for example, there were 8,758 deaths from alcohol-related causes in the UK in 2006, twice as many as there were 15 years before (National Audit Office, 2008).

An increase in the affordability of alcohol (affordability being a function of the relative price of alcohol and disposable income) has been associated with the increase in alcohol consumption in the last few years; alcohol was 69 percent more affordable in the UK in 2007 than it was in 1980 (NHS, 2009).

This increase in alcohol affordability can be attributed both to significant (inflation-adjusted) increases in income in the UK over the last 15 years, as well as to a decrease in the relative price of alcohol (Rabinovich *et al.*, 2009). In the UK specifically, the relative price of alcohol decreased by just under 15 percent between 1996 and 2004, and disposable income increased by over 50 percent over the same period (*ibid*). The combination of both phenomena makes alcohol more affordable now than it has been in the last two decades.

These levels of alcohol consumption have been associated with a range of alcohol harms facing the UK. For instance, as the affordability of alcohol has increased, the proportion of

[3] In terms of gross value added (GVA), which is the difference between the value of goods and services produced and the cost of raw materials and other inputs used in production.

violent incidents in which victims thought the perpetrator was under the influence of alcohol increased 15 percent from 1995 to 2008/09.[4] In total across the UK, it is estimated that there were approximately 973,000 incidents of alcohol-related violence in 2008[5], making alcohol a factor in nearly half of all violent crimes.[6] Other alcohol harms of concern in the UK include anti-social behaviour, domestic violence, chronic health harms (such as liver cirrhosis) and acute health harms (such as injuries from car accidents), and others.

Implications for public policy

The changes in alcohol affordability have important implications for public policy. The balance of decades of existing empirical evidence indicate that there is a positive association between income and alcohol consumption (that is, as incomes go up, consumption goes up as well) and a negative association between alcohol prices and consumption (when the price of alcohol increases, consumption decreases) (see for example (Wagenaar *et al.*, 2009) for a recent meta-analysis). A recent RAND study, one of the few studies that look specifically at the link between *affordability* (a composite measure of income and price) and consumption, echoes the existing evidence; looking at alcohol affordability across the EU, the study has shown that there is a positive association between alcohol affordability and consumption. More specifically, the study shows that on average across the EU a 1 percent increase in affordability is associated with a 0.32 percent increase in consumption in the long run (Rabinovich *et al.*, 2009).

Studies from around the world have also consistently demonstrated that a population's level of alcohol consumption is linked with the level of various types of chronic and acute harms, which incur costs on individuals and society. This research indicates that "there is a very close link between a country's total alcohol per head consumption and its prevalence of alcohol-related harm and alcohol dependence, implying that when alcohol consumption increases, so does alcohol-related harm and the proportion of people with alcohol dependence, and vice-versa" (Anderson *et al.*, 2009):p. 2236).

Major reviews by Rehm *et al.* (2003), Gmel and Rehm (2003) and Meier *et al.* (2009) identify a full range of negative outcomes associated with alcohol consumption. For example, alcohol is associated with liver cirrhosis, hypertensive disease and a number of other conditions including certain types of cancer (Rehm *et al.*, 2003). Through impairment of judgement and motor skills, alcohol is also associated with violence, sexually transmitted diseases and intentional and unintentional accidents and injuries (most notably traffic accidents and fatalities) (*ibid*; Gmel and Rehm, 2003; Anderson *et al.*, 2009; see also Corrao *et al.*, 2004).

Alcohol consumption is also positively correlated with violent incidents and negatively with measures of workplace productivity (Gmel and Rehm, 2003).[7] Finally, through its

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[4] Statistically significant increase.

[5] Home Office. Crime in England & Wales 2008/09.

[6] Defined as assaults, robbery and snatch thefts in which the victim considered the perpetrator to be 'under the influence' of alcohol.

[7] It is important to note, however, that the attribution of causality from alcohol consumption to both violence and workplace productivity is complicated by the presence of a number of confounding variables. There are

dependence-forming quality, alcohol is associated with family disruption and other social harm (Rehm *et al*,. 2003).[8]

Numerous attempts have been made to estimate the costs of alcohol-related harms to society. For example, an estimate from 2003 put the cost of alcohol misuse in the EU at around €125 billion – equivalent to 1.3 percent of gross domestic product (GDP) (Anderson and Baumberg, 2006). In England, the cost to the National Health Service (NHS) alone of alcohol-related harms has been estimated to be GBP2.7 billion in 2006/7 prices (NHS 2009). In 2004, the Government's Strategy Unit estimated the total cost of alcohol-related harm in the UK to be around GBP20 billion a year (Prime Minister's Strategy Unit, 2004). This cost is "made up of alcohol-related health disorders and disease, crime and anti-social behaviour, loss of productivity in the workplace, and problems for those who misuse alcohol and their families, including domestic violence" (*ibid*., p. 4).

Evidence-based alcohol policies

Over the last few years, the need to address these challenges has called for reviews of existing evidence and the development of new evidence of what works in tackling alcohol-related harms. The aim is to establish an evidence-based policy mix that maximises benefits and minimises costs to society. Many approaches make up the existing UK alcohol policy mix. Measures are in place to prevent drink-driving and the sale of alcohol to minors, to regulate the retail of alcohol in communities, to educate the population on the risks of alcohol misuse, and to treat those with alcohol dependence.

With the exception of taxation, alcohol *pricing* policies (policies that aim to regulate the price of alcohol in order to decrease consumption and harms) have not been extensively used in the UK. In addition to alcohol taxation, pricing policies include the imposition of a minimum price per unit of alcohol sold to consumers, bans on the sale below cost of alcohol (which supermarkets in particular engage in when they use alcohol as a loss-leader), and restrictions on sales promotions such as two-for-one, 'happy hours' and volume discounts. A significant body of evidence suggests that pricing policies can be one of the most effective levers at governments' disposal to reduce alcohol consumption and related harms (see, for example, reviews of evidence by (Babor *et al.*, 2003; Meier *et al.*, 2009; Chisholm *et al*., 2004). This is because extensive research has indicated that, as with most

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many factors affecting workplace productivity, other than drinking (Gmel and Rehm, 2003). These include boredom on the job, repetitive tasks, shift work, and workload, all of which are related to stress, poor work performance and drinking. The question then is one of reverse causality; whether these other workplace factors may lead to increased alcohol use as a coping device, rather than the alcohol use leading to reduced workplace productivity. There are also questions about the link between alcohol and violence/aggression, and whether the deciding factor is a pharmacological one (alcohol affects the parts of the brain involved in decision-making and impulse control), a social and cultural one (certain social contexts may inhibit or disinhibit drinking and violent acts) or a mixture of the two (*ibid*.).

[8] While the link between alcohol consumption and harms has been extensively studied, there is much less understanding of the benefits from (moderate) alcohol consumption aside from a reduced risk of heart disease, although there is still dispute over this benefit (see for example Chikritzhs *et al*., 2009). Psychological benefits attributed to alcohol have included mood enhancement, sociability, stress relief and so forth. In one of the few studies examining these benefits 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).

other commodities, changes in the price of alcohol are associated inversely with changes in alcohol consumption (*ibid.*). However, except for alcohol taxation, which is used to some extent in most countries worldwide, the others have not been extensively used, so their potential impacts are yet to be fully understood.

1.3 Aims of this study

In the context of growing interest on the appropriateness of pricing policies as part of the UK's alcohol policy mix, the Home Office commissioned RAND Europe to conduct a study that would review the existing evidence on the economic impact of different pricing policies, and conduct a preliminary analysis of the implications for intervening in the market for alcohol. The Home Office was particularly interested in gaining a more in-depth understanding of three specific pricing policies that are prominent in current alcohol policy debates, namely increases in alcohol excise duty rates, the imposition of a minimum price and a ban on sales below cost of alcoholic beverages.

1.3.1 Defining the key concepts

In this section, we briefly define the three key concepts in the study, to ensure clarity and transparency.

Taxation

Taxation is one of the pricing policies on which this study focuses. More specifically, the focus is on excise duty rates (rather than value-added taxation, although this is also discussed where relevant). A detailed description of excise duty rates and the rationale for using them is provided in Chapter 3.

Minimum price/pricing

This is the second pricing policy of interest in this study, and refers to the implementation of a minimum price per unit of pure ethanol set by government for alcoholic beverages; the policy stipulates that retailers cannot sell alcoholic beverages below this minimum price (this policy has been used for other products, most notably tobacco). A more in-depth description of this policy is provided in Chapter 3.

Bans on sales below cost

This third pricing policy on which this study focuses refers to regulations stipulating that a particular product (in this case alcohol) cannot be sold for a price lower than the seller's cost of doing business or some other proxy. The exact definition of 'cost' has varied in the different places where this measure was implemented; for instance, in Ireland 'cost' was defined as the net invoice cost of the good by the supplier, excluding all off-invoice rebates, while in France 'cost' was defined as the next invoice cost *plus* the transport cost, also excluding rebates and reductions not on the invoice (Allain and Chambolle, 2004). Another definition of 'cost' is 'Value Added Tax plus excise duty' on a particular product. In Chapter 3, which reviews existing research on bans on sales below cost, the definition of 'cost' reflects that used in the particular papers cited. In subsequent chapters, following consultation with academic experts, alcohol industry representatives and the Home Office, we discuss issues concerning different definitions and then use the VAT + excise duty definition in our economic analysis of possible impacts of such a policy.

1.4 Research approach

Two main activities were undertaken in the course of this research: a Rapid Evidence Assessment (REA) of existing research on the three policies of interest to the Home Office (minimum pricing, taxation and bans on sales below cost) and a presentation of data on the market for alcohol so as to understand the potential magnitude of impacts for intervening in the alcohol market. This section describes each of these in turn.

1.4.1 Rapid Evidence Assessment

A Rapid Evidence Assessment (REA) is a comprehensive, systematic and critical assessment of available evidence, carried out within a limited time-frame, in order to provide balanced evidence on a given policy question. It was more appropriate than a full systematic review, given the constraints of time and budget that operate in this project. The findings from the REA, outlined in Chapters 2 and 3 of this report, also inform the inquiry in the second part of the study, the economic analysis described below.

The aim of the REA was to review existing research on the economic impact of the three policies of interest, focusing primarily on the policies' economic impact on different types of consumers, on the various sectors of the alcohol industry and on wider economic indicators such as employment and fiscal revenue. Following the Home Office specifications, this REA did not examine research that was *not* linked to the impact of the three pricing policies of interest, for instance research on non-legislative shocks to the alcohol industry (such as from an economic recession) or on the economic impact of other policies (such as smoking bans in the on-trade, alcohol advertising restrictions or mandatory warning labels). While these broader topics may be relevant and informative, they fell outside the scope of the present inquiry.

1.4.2 Economic analysis

In addition to an evidence assessment, we present a general understanding of the implications of price floors (for example minimum pricing and ban on sales below cost) and product taxation in this market. That is, we located evidence regarding the market structure for alcohol (namely whether it is a monopoly, perfectly competitive, etc) and then utilising economic principles, we describe in theory the ways in which the proposed policies may affect industry and consumer surpluses in this market type. Furthermore, we present statistics describing the consumers and producers of the UK, as well as government involvement (through tax revenues).

This study is not a comparative cost-effectiveness or cost-benefit analysis; this is an exploratory assessment of the Government's policy options. As such, we analyse the (academic and grey) evidence, present basic statistics, and draw upon interviews with producer and retailer representatives as well as academics in economics and business. By covering the basis with evidence and expert advice, we deliver a sound and full understanding to Government regarding a range and extent of economic impacts that pricing options may have on consumers and producers.

CHAPTER 2

What do we know about the link between alcohol price and consumption?

This chapter summarises the evidence on the link between alcohol prices, consumption and harms, necessary to better understand the economic impacts of the specific pricing policies on which this paper focuses (taxation, minimum pricing and bans on below cost sales), discussed in detail in later chapters. The findings in this chapter also provide the rationale behind the three pricing policies; namely, it describes the reasons for the implementation of policies affecting the price of alcohol with public health and welfare goals.

2.1 Do consumers respond to changes in alcohol prices?

Research, analysis and use of pricing policy interventions to tackle alcohol misuse all rest on an extensive body of research that demonstrates that consumers respond to changes in alcohol prices in much the same way as they respond to changes in the price of other commodities. That is, increases in the price of alcohol generally lead to decreases in consumption, and vice-versa (reviews of this evidence include (Anderson *et al.*, 2009; Babor *et al.*, 2003; Chaloupka *et al.*, 2002; Cook and Moore, 2002; Elder *et al.*, 2010; Fogarty, 2006; Meier *et al.*, 2009).

While much of this research originates in the United States, Canada and Australia, a growing number of studies are being produced in Europe. Recent natural experiments in Switzerland, Sweden and Finland (which experienced alcohol price decreases following liberalisation of alcohol control policies) have been extensively studied. Like the balance of international evidence, these European studies also find that alcohol consumption is responsive to changes in prices (see, for example: Heeb *et al.*, 2003; Helakorpi *et al.*, 2010; Kuo *et al.*, 2004; Kuo *et al.*, 2003, Mäkelä *et al.*, 2007; Mäkelä *et al.*, 2009).

The finding on the negative association between alcohol prices and consumption "concurs with a fundamental law of economics called the downward sloping demand curve, which states that as the price of a product rises, the quantity demanded of that product falls" (Chaloupka *et al.*, 2002). This rule has been found to hold even for potentially addictive products such as alcohol, illicit drugs and tobacco; numerous studies have clearly demonstrated that

> "even addictive behaviors are sensitive to changes in the full price of the substance being used, where the full price of a good reflects not only its monetary cost, but also the health costs, legal costs, and time costs involved in obtaining and using the good. When the full price of an addictive substance rises, consumption of that substance falls. As consumption falls, so do the negative consequences associated with excessive use and addiction"(Pacula and Chaloupka, 2001).

2.1.1 Responsiveness among hazardous and harmful drinkers

Nevertheless, there is variation in the extent to which different types of consumers respond to changes in alcohol prices. Some studies, for instance, suggest that, like moderate drinkers, heavy drinkers also change their consumption as drinks become more or less expensive, while other studies have indicated that heavy drinkers are not very sensitive to price changes (Pacula and Chaloupka, 2001).[9] The latter finding, however, is not consistent with the balance of research showing that the negative outcomes of alcohol misuse (many of which, like liver cirrhosis and violence, are strongly associated specifically with heavy drinking) are in fact sensitive to changes in the full price of alcohol; that is, studies have shown that when the price of alcohol goes up, alcohol-related harms go down and vice-versa (*ibid*. Also, Cook and Moore, 2002; Elder *et al.*, 2010; Farrell *et al.*, 2003; for more on this see section 2.1.2).[10]

Text box 2-1: Price elasticity of demand

The concept of price elasticity of demand is used in economics to describe the sensitivity of consumption to changes in the monetary price of a product (ie the percentage change in consumption resulting from a 1-percent increase in price). For example, a price elasticity of alcohol demand of -0.5 means that a 1 percent increase in price would reduce alcohol consumption by 0.5 percent.

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[9] The international literature on alcohol consumption uses a wide range of terms to categorise different types of drinkers, including light, moderate, heavy, problem, binge, and hazardous and harmful drinker. The definition of each of these terms also varies. In this paper we use previous guidelines on alcohol consumption in England that are also used in the study by Brennan *et al*. (2008). These are: "moderate drinkers", ie drinkers with an intake of alcohol less likely to damage health and/or associated with negative consequences (up to 21 units per week for men and 14 units for women); "hazardous drinkers", ie, drinkers with an increased risk of psychological and physical consequences due to alcohol intake (more than 21 to 50 units per week for men and more than 14 to 35 units for women); "harmful drinkers", ie drinkers with an intake that is likely to adversely affect health and/or have other negative consequences (more than 50 units per week for men and more than 35 units per week for women), and; "binge drinkers", defined as individuals with an intake of more than twice the recommended daily limit (ie more than 8 units per day for men and more than 6 units per day for women) (*ibid*.). Nevertheless, we retain the terminology used in particular studies when referencing them specifically. It is worth noting that DH drinking classifications have recently changed from moderate, hazardous and harmful to lower risk, increasing risk and higher risk (for more information, see http://www.nhs.uk/Livewell/alcohol/pages/effectsofalcohol.aspx last accessed June 2010).

[10] There are a number of experimental studies examining how the cost of obtaining alcohol affects alcoholics' responses. They have found that "when there are immediate costs to obtaining a drink, alcoholics will moderate consumption" (see Cook, 2007, p. 77 for short descriptions of some of these studies). An experimental study from 1978 compared the price responsiveness of casual drinkers with that of heavy drinkers. It found that when faced with a "happy hour" situation in which prices were cut in half, both groups approximately doubled the number of drinks they consumed (Babor *et al.*, 1978).

A related finding from the research is that hazardous and harmful drinkers tend to choose cheaper alcoholic beverage, as they seek to maximise ethanol intake for the money they spend. Research from the UK, for example, shows that changes in the price of cheaper alcoholic beverages sold in the off-trade have a stronger impact among hazardous drinkers, including young male hazardous drinkers whose consumption is also affected by higher prices for cheaper on-trade beverages (Meier *et al.*, 2009). Studies from other countries echo these findings. A study by Gruenewald *et al.* (2006) that examined a series of price adjustments by Sweden's alcohol monopoly *Systembolaget* between 1984 and 1993 shows that in response to general alcohol price increases, consumers substitute with cheaper alcoholic beverages, or purchase their drinks in cheaper venues. Using the empirical results from their study, the authors estimated the impact of changes in average beverage prices under different scenarios. They found that that a 10 percent price increase that resulted in higher prices for all beverages would result in a 1.7 percent drop in alcohol sales, whereas a price increase that affected only lower-quality beverages would lead to a 4.2 percent 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 lead to reductions in consumption levels as consumers have no cheaper alcoholic alternative (for another study of effect of price changes on substitution for cheaper drinks in Sweden, see Ponicki *et al.*, 1997).

Substitution for cheaper drinks has also been found elsewhere. In the US, it has been shown that the top 10 percent of drinkers spend about $.87 per drink compared with $4.75 per drink for the bottom 50 percent of drinkers (Kerr and Greenfield, 2007). In Australia, a study shows that young drinkers often use standard drink labels on alcohol containers to calculate the cheapest way of getting drunk (Jones and Parri, 2009).

2.1.2 Young people's responses to changes in price

Similar questions have been examined regarding the sensitivity to prices of men versus that of women, of consumers of different ages, and of consumers of different socio-economic backgrounds. A significant amount of research has focused on the price sensitivity of young drinkers, a group of particular interest given its high incidence of binge drinking and alcohol-related harm (for a review of the evidence, see Cook and Moore, 2002; Meier *et al.*, 2009). This focus is also important because research suggests that alcohol abuse during youth is associated with alcohol abuse later in life (Chaloupka and Pacula, 2002), which indicates that curbing alcohol abuse in this segment of the population can have important effects in the long-term.

UK youth now have among the highest levels of alcohol consumption and binge drinking in the EU, and also experience drunkenness at an earlier age than most of their European counterparts (Bellis *et al.*, 2007). A study looking at predictors of risky alcohol consumption among youth in the UK indicates that the level of binge, frequent and public drinking are strongly related to the amount of spending money youth have available (*ibid.*). The authors suggest that increasing the price of alcohol could limit the amount of alcohol youth consume at any given amount of spending money they have.

In the US, where much of the research on this issue originates, traffic accidents are the leading cause of death of people under the age of 35, and alcohol is involved in more than half of these fatal crashes (Chaloupka and Pacula, 2002). Most of the studies have found

that young people, especially young drinkers who drink frequently and those who drink heavily, are more sensitive to price changes than either older drinkers or infrequent and light young drinkers, a finding with important implications for public policy in societies where hazardous and harmful youth drinking is of special concern (for a review of research see (Grossman *et al.*, 1994; Gallet, 2007; Chaloupka and Pacula, 2002).[11]

2.1.3 Responsiveness by income

The evidence on the price responsiveness of low-income people is much less extensive. There is some 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, 2006). A recent paper uses UK Expenditure and Food Survey data to assess purchasing patterns of cheap alcohol across income groups (Ludbrook, 2010). The paper finds that all income groups, and not just the lowest income group, purchase low price alcohol in the off-trade sector. Moreover, there is little difference between the amount of lowest priced alcohol (below 30p per unit) purchased by the lowest and middle income groups, although they do buy more of this than the highest income group (*ibid.*).

There is evidence to suggest that changes in income, rather than prices, have effects on the drink choice however. Gallet's meta-analysis examined income elasticity of demand for different types of drink (that is, the percentage change in demand for alcohol associated with a 1 percent change in income). He found that 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) (*ibid.*). This analysis might suggest that beer tends to be 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.

2.1.4 Responsiveness by drink choice

Yet another area of interest for public policy is the way in which the demand for different types of alcoholic beverages changes in response to changes in their price. A recent meta-analysis of alcohol demand 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.*, 2009). Specifically, the meta-analysis found that 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 median elasticities reported by Gallet in his meta-analysis (2007), which found that consumption of beer is less responsive (median elasticity: -0.36) to changes in price than wine (-0.70) and spirits (-0.68).[12]

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[11] One exception to this finding has been a study by Dee (1999) which found that youth drinking is not sensitive to price.

[12] Differences between the reported elasticities of these two meta-analyses may be explained a) by the difference

A large-scale modelling exercise performed on English and Welsh data (published too recently to be included in the meta-analyses mentioned above) estimates for each type of beverage a range of different price elasticities for on-trade, off-trade, high-price and low-price drinks. As in the meta-analyses, the study finds a consistently negative relationship between alcohol price and consumption: -0.4794 to -0.5525 for beer, -0.2829 to -0.5764 for wine, and approximately -0.62 for spirits (Brennan *et al.*, 2009). Unlike in the meta-analyses, there is little difference between the elasticities of beer and wine in the Brennan *et al.* study, while consumption of spirits is clearly more sensitive to price than consumption of beer or wine. UK Government Economic Service estimates of the price elasticity of different types of alcohol also found negative elasticities, albeit somewhat higher than those of the large-scale modelling study mentioned above: -0.48 for on-trade beer, -1.03 for off-trade beer, -1.31 for spirits and -0.75 for wine excluding coolers (Huang, 2003).

2.2 Link between alcohol prices and alcohol-related harm

While the evidence presented above describes findings on the link between price and consumption, there has been much related research examining the effects of changes in alcohol prices on various outcomes (harms) related to alcohol consumption such as liver cirrhosis mortality and other chronic health conditions, traffic accidents and deaths, violence and crime, and so forth. The balance of this research has found that increases in alcohol prices are linked to decreases in these types of harms, and decreases in prices are linked to increases in harms (recent reviews of this literature include Cook and Moore, 2002; Elder *et al.*, 2010; Meier *et al.*, 2009). For individual European studies, see Helakorpi *et al.*, 2010; Herttua *et al.*, 2008; Koski *et al.*, 2007; Kuo *et al.*, 2004; Mäkelä *et al.*, 2009.

Text box 2-2: Alcohol, cannabis and tobacco: complements or substitutes?

The question of whether alcohol and other substances like cannabis and tobacco are substitutes or complements has been examined in international research. A number of studies have focused on whether changes in alcohol policy (including alcohol pricing policy) have an effect on the consumption of these other substances. Specifically, some studies have asked the question: what happens with consumption of other substances when the price of alcohol increases (or decreases)?

Much of the research on alcohol and cannabis originates in the US. Some of the earliest research on this question found that alcohol and cannabis are substitutes (DiNardo and Lemieux, 1992; Model, 1991; Model, 1993). However, more recent studies found that alcohol and cannabis are complements (Pacula, 1998; Saffer and Chaloupka, 1999; Thies and Register, 1993; Pape *et al.*, 2009). Saffer and Chaloupka (1999) and Pacula (1998) both found a negative relationship between alcohol prices and cannabis use. Farrelly *et al.*

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) (Rabinovich *et al.* 2009).

(1999) find a negative relationship between alcohol prices and cannabis use for youth but not for adults (for a review of this research see Cameron and Williams, 2001).

There is also research on the interdependency between tobacco and alcohol; most of this literature, irrespective of the country considered, finds the cross-price effects of alcohol and tobacco to be negative, therefore concluding that the two are complements rather than substitutes (see, for example Tauchmann et al., 2006; Jimenez and Labeaga, 1994; Decker and Schwarz, 2000; Cameron and Williams, 2001; Zhao and Harris, 2004; Picone *et al*. 2004).

These findings have very important policy implications. For example, if cannabis and alcohol are complements, with cannabis consumption responding to changes in alcohol prices, then implementing measures that increase the price of alcohol and thus decrease its consumption could have a desirable knock-on effect on cannabis consumption as well. This in turn constitutes an alternative policy instrument to the criminal justice system to deal with cannabis consumption (Cameron and Williams, 2001). It is a similar story with tobacco; if alcohol and tobacco are complements, and implementing policies that increase the price of alcohol reduces both alcohol and tobacco consumption, the public health gain from this policy extends beyond the alcohol field.

More research in the UK is needed in order to identify these relationships as there are cross-country differences in culture, alcohol laws, drug laws, social programmes, etc that may influence the relationship and make lessons from the US non-transferable to the UK situation.

2.3 Final remarks

In this chapter we summarise the evidence on the link between alcohol prices, consumption and harms. This research provides the context and rationale for pricing policies to tackle alcohol harms. In sum, the balance of the research presented above clearly indicates that policies that increase the price of alcohol can be effective in reducing alcohol harms. The magnitude of this effect, however, depends primarily on the type of policy used to increase prices, and the specific elasticities of demand of different consumers in different places. In the next chapter, we turn to a discussion of three particular types of pricing measures (taxation, minimum pricing and bans on below-cost sales) that constitute possible policy levers to tackle alcohol harms.

CHAPTER 3

Evidence on economic impacts of alcohol pricing policies

Having considered in the previous chapter the body of evidence indicating that people respond to prices by reducing their consumption, this chapter presents the results of a review of research on the three specific pricing policies on which this study focuses (taxation, minimum pricing and bans on sales below cost). In particular, the review focused on research on the impact of these policies on different types of consumers, alcohol producers and retailers, fiscal revenue, and other economic outcomes. Gaps in the literature on economic impacts are highlighted in the chapter's summary of findings.

There is a substantial body of evidence on policies that can be used to reduce alcohol consumption and harms. Policies that have been studied include those focusing on education and awareness (for example school-based education and social marketing programmes, etc), health sector responses (such as screening and brief intervention, benzodiazepines for alcohol withdrawal, etc), drink-driving prevention measures (for example random breath testing, limits on alcohol blood concentration, alcohol locks, etc), measures addressing the availability of alcohol (such as licensing laws, government monopolies, minimum legal drinking ages, etc), and measures addressing the marketing of alcohol (for example alcohol advertising bans or restrictions, etc), among many others. There are studies examining the effectiveness of each of these examples, as well as reviews and meta-analyses that summarise the existing evidence (for comprehensive reviews of these and other alcohol policies see Anderson and Chisholm, 2009; Babor *et al.*, 2003). Below, we discuss the rationale behind using pricing policy interventions and provide evidence regarding the use and economic impacts of these policies.

3.1 Rationale behind pricing policy interventions

Pricing policies, that is policies that aim to influence the price of alcohol with the intention of reducing consumption and harms, have also been subject to extensive investigation. Pricing policies are based on the theory and evidence that drinkers respond to changes in the price of alcohol in a similar way as they respond to changes in the price of other consumer products, as described in section 2.1 above. Thus, pricing policies typically aim to influence the price of alcohol so as to affect consumption and minimise alcohol-related harms.

There are a range of pricing policies, including alcohol taxation, the imposition of a minimum price per unit of alcohol sold to consumers, bans on the sale below cost of

alcohol, the establishment of government alcohol monopolies (which control price and restrict availability) and restrictions on sales promotions such as two-for-one, 'happy hours' and volume discounts. A significant body of evidence suggests that pricing policies (in particular taxation, on which much research has been conducted) can be one of the most effective (and cost-effective) levers at governments' disposal to reduce alcohol consumption and related harms (see for example reviews of evidence by Meier *et al.* 2008; Babor *et al.* 2003; Chisholm *et al.* 2004; Anderson and Chisholm, 2009).

In the following sections, the evidence on the economic impacts of three of these pricing policies (taxation, minimum pricing and bans on sales below cost) is presented. As described in the Introduction, the Home Office commissioned this study to focus specifically on the economic impacts of these three pricing policies.

3.2 Taxation

3.2.1 Reasons for alcohol taxation

Excise taxes on products such as tobacco, fuel and alcohol are usually levied either to discourage or control consumption of such goods, and on Pigovian grounds due to the external costs associated with use of these goods (Kenkel, 1996). As discussed in previous sections, these external costs include those incurred through alcohol-related traffic accidents and fatalities, criminal justice costs, costs from health effects of excessive drinking which are most often only partly borne by the drinker, absenteeism and loss of productivity at work, and others (*ibid.*). Alcohol excise taxes specifically have been used in countries around the world with both aims, which is to discourage consumption relative to non-alcoholic drinks, or to shift consumption to alcohol products with lower alcohol by volume (Babor *et al.*, 2003) and to raise fiscal revenue.[13]

Unlike income or property taxes, where rates increase progressively as income or property value go up, excise taxes are considered a regressive form of taxation because everyone is subject to the same level of taxation for the particular product or service. As discussed below, this has been one of the strongest points of contention in debates on the appropriateness of excise duty as an alcohol policy.

3.2.2 Evidence on the impact of taxation on consumption

Extensive research has been conducted on the impact of changes in the rate of alcohol excise duty on alcohol consumption and harms. A number of reviews of this literature also exist that summarise the balance of evidence (see, for example Ludbrook *et al.*, 2002; Babor *et al.*, 2003; Chaloupka *et al.* 2002; Meier *et al.*, 2008; Elder *et al.*, 2010). As

[13] Most research on the appropriate level of alcohol taxation has focused on the extent of externalities (eg from drink-driving, violence, health problems, etc). Very little research has studied the question of the appropriateness of alcohol taxes for raising government revenue, which would reduce the need to raise revenue from other types of taxes (particularly income tax) that distort factor markets. One study from the US suggests that the fiscal component of an optimal alcohol tax could be higher than its externality-correcting component (Parry *et al.*, 2006). Modelling optimal levels and welfare effects of alcohol taxes and drunk driver penalties while accounting for how policies interact with pre-existing tax distortions in the labour market, the study suggests that alcohol taxes in the US are far lower than their optimal levels (*ibid*).

discussed earlier in the previous chapter, there is a significant body of literature also examining the impact of prices on alcohol consumption and harms.

The research on the effects of *taxation* and on the effects of *price* are closely related as the mechanism by which taxation influences consumption is through its effect on prices. Collectively, the balance of evidence on the effects of alcohol prices and of taxation clearly indicates that increases in taxation and prices are associated with decreases in alcohol consumption and harms. Importantly, the research states that the real, and not just the nominal price of alcohol must rise, at or above the level of inflation, for taxation to be effective in tackling alcohol harms (see, for example Rehn, Room and Edwards, 2001).

While alcohol taxation is a blunt instrument (in that all consumers face the same level of taxation), research indicates that because the amount of tax paid is directly related to the amount of alcohol consumed, "increases in alcohol excise taxes will be disproportionately paid by excessive drinkers, who also experience most of the alcohol-related harms and thus generate most alcohol-attributable economic costs" (Freeman, 2000; Elder *et al.*, 2010).

A complaint levied against the use of high duty rates on alcohol is that it may reduce drinking among middle-age and older consumers, for whom some health benefit from alcohol consumption has been found. Econometric research from the US, however, indicates that "a tax increase resulting in a reduction in drinking lowers all-cause mortality in the short run" and that "[t]he possibility that this effect would eventually be reversed for middle-aged people (due to the cumulative effects of some people drinking 'too little' for a number of years) does not appear to be well founded" (Cook *et al.*, 2005).

Even though the overall finding is that taxation is effective in reducing alcohol consumption and harms, estimates of the size of the effect vary considerably. This may be explained by differences in the prevailing social, cultural and economic circumstances of the countries and regions where research has taken place (Ludbrook *et al.*, 2002; Babor *et al.*, 2003), although the direction of the effect is the same.

3.2.3 What is the 'optimal' tax rate?

It is important to note, though, that taxation can only be effective insofar as it increases the price of alcohol, even if by less than the amount of the tax increase; if retailers absorb this change, consumers continue to afford the same quantity of alcohol as before, and taxation thus has a minimal impact on public health and other alcohol-related outcomes. However, 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 improvements in individual and societal outcomes (Kenkel, 2005).

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*). Some research on this question, however, was conducted in the US, which shows 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). Conversely, a study from Switzerland shows that when faced with a modest increase in the taxation of spirits, the

industry responded by reducing its share of profits to avoid the loss of customers, resulting in no observed changes in the price of domestic spirits (Heeb *et al.*, 2003). No research has been identified in the context of this study addressing the question of alcohol taxation pass-through rates in the UK.[14] Understanding the pass-through rate from tax increases to prices is a key pre-condition to shedding light on how tax changes would affect consumers, producers, retailers and society as a whole.[15]

3.2.4 Cross-border and other unrecorded consumption

There is limited research on the effects of alcohol taxation on other economic outcomes, such as the extent to which increases in tax result in shifts to unrecorded consumption (for example illicit trade in alcohol, home production of alcohol, cross-border alcohol purchases for personal use, and non-commercial alcohol beverages). A number of papers seem to suggest that some shift to unrecorded consumption may occur when prices go up, but whether and how this happens differs widely by country (and even within countries), and depends also on the extent of the price increase (for discussions on these issues see, for example Gruenewald and Treno, 2000; Nordlund and Osterberg, 2000; Beard *et al.*, 1997).

A number of papers examine cross-border alcohol consumption in the Nordic countries, although most of this is related to the change in EU regulations regarding cross-border purchases of alcohol for personal use, and the effect of this on alcohol taxation and prices (see, for example Makela *et al.*, 2007; Makela *et al.*, 2008; Makela and Osterberg, 2009; Koski *et al.*, 2007; Herttua *et al.*, 2008). The balance of this research found that the introduction of indicative levels for cross-border alcohol purchases for personal use (within the EU) have led to increases in cross-border purchases especially from Finland to Estonia, and to a lesser extent from Southern Sweden to Denmark.

Research focusing on Ireland found that lower taxation and prices in Northern Ireland (where UK taxes apply), coupled with exchange rate fluctuations since Ireland's membership of the European Monetary System, led to significant cross-border alcohol shopping from the Republic of Ireland, which had significantly higher alcohol excise duty rates and with which Northern Ireland shares a long land border (Walsh, 1989). According to the paper, this in turn resulted in a serious loss of excise revenue to the Irish exchequer; between 1981 and 1983 alone, the quantity of spirits sold subject to Irish excise taxes declined by 24 percent and the receipts from this tax fell by 15 percent (*ibid.* p. 1169). Nonetheless, the paper concludes by stating that "[t]here is evidence for Ireland and other

[14] A related issue, which has also not received much research attention, is that of the possible non-linearity in tax elasticity. That is, it is possible that there is a threshold at which taxation increases become more meaningful to consumers and make a significant difference to their drinking, and that at some (higher) level of taxation the response is to cease to drink altogether (Freeman, 2000). The non-linearity of tax elasticities, however, is not well understood yet.

[15] An important, and related, consideration is whether taxes are levied on an *ad valorum* basis (ie as a sales tax based on value) or on a volumetric basis (ie according to either total beverage volume or to the volume of pure alcohol in a beverage). Research from Australia shows that an *ad valorum* method was adopted for wine taxation, which continued previous taxation arrangements that favoured cheap bulk and fortified wine products such as cask wine; the paper suggests that should a volumetric approach have been adopted instead, wine taxation would have actually increased the floor of alcohol prices occupied by those cheaper products and thereby reduced their consumption (Gray *et al.*, 2000).

countries… that high excise taxes do reduce the level of alcohol-related problems" (*ibid*). An older study also examining cross-border alcohol shopping between Ireland and Northern Ireland found that distance from the border and the presence of a car in the household are important determining factors in the extent of this activity (FitzGerald *et al.*, 1988). This finding echoes those of a study of cross-border alcohol shopping from Denmark to Germany, which found that an estimated 50 percent of cross-border shopping was done by Danes living within 50 kilometres of the German border (Danish Institute of Border Region Studies, 1989, cited in Crawford and Tanner, 1995b).[16]

More recently, a study on cross-border alcohol and tobacco shopping from Norway to Sweden arrived at a similar conclusion: stores near the border report lower revenues on sales of goods that are highly taxed than those further away (Beatty *et al.*, 2009). An earlier study had found that near the Norway–Sweden border, 49 percent of beer consumed by residents on the Norwegian side was purchased in Sweden, where alcohol taxes were considerably lower (Beatty *et al.*, 2007).[17]

There is also research from the US. One paper models the effect of differences in taxes on beer and spirits in neighbouring states, finding that: (1) higher taxes reduce consumption, (2) although some consumers do cross state borders in response to increases in state excise duty, in the vast majority of states cross-border alcohol consumption is small enough that modest tax or price hikes would still raise tax revenues (Stehr, 2007). This study, and another one on tobacco tax differences between neighbouring regions in the US (Chiou and Mueglegger, 2008), both agree that policymakers may overestimate the magnitude of cross-border shopping as a result of tax/price differentials, and that current tax rates for both alcohol and tobacco in the US are below their revenue maximising levels even when some cross-border shopping does occur. Older research also from the US finds either little or no evidence of border-crossing effects due to alcohol price differentials (Baltagi and Goel, 1990; Baltagi and Griffin, 1995; Beard *et al.*, 1997).

A small number of papers focus on cross-border consumption from or into the UK territory, although the focus is not on the impact of pre-existing price and tax differentials. For example, one study examines the UK alcohol taxation system in the light of cross-border alcohol purchases for personal use (Crawford and Tanner, 1995). The study models the impact of cross-border shopping on domestic alcohol demand, price responsiveness and tax revenue, finding that "a policy of cutting tax rates on beer and wine [to increase domestic tax revenue] is likely to cause revenues to fall" (*ibid.*, p. 109). A follow-up study from 1999 finds no change on the demand elasticity of beer, wine and spirits since 1993 (the year on which the first study focused), and that the duty rates on beer and wine were still below their revenue-maximising levels although the authors cannot reject the

[16] A recent systematic review of the literature on general fiscally-induced cross-border shopping reports that the balance of evidence suggests that tax differentials between neighbouring territories induces consumers to cross borders to purchase goods where taxation is lower, on the condition that the tax saving compensates for the transport costs associated with the travel involved (Leal *et al.*, 2010).

[17] At the time this paper was written, beer taxation in Norway (in NOK) was 7.95 for 50cl, 4.7 percent alcohol by volume, whereas in Sweden it was 2.95. For liquor (70cl, 40 percent alcohol by volume) the rates were 152.32 in Norway and 120.00 in Sweden, and for wine (75cl, 12 percent alcohol by volume) it was 31.95 and 14.15 respectively (Beatty *et al.*, 2007).

hypothesis that the current (1999) excise duty rate for spirits is at its revenue-maximising level (Crawford *et al.*, 1999). In her paper, Smith (1999) arrives at the same conclusions.

A paper that also examines the effects of the introduction of the Single Market found that the Single Market has created tax competition between EU Member States where there was none before (Lockwood and Migali, 2009), as countries compete to retain domestic and capture foreign demand for particular products, most notably alcohol and tobacco. This in effect means that tax rates in the UK (and other EU countries) are not independently set but are inter-dependent.

For the UK in particular, the significant current tax (and price) differential in alcohol between the UK and France may account for why many consumers travel to France from the UK to buy alcohol in bulk, which they then bring back to the UK (Rabinovich *et al.*, 2009). Given current EU regulations, intra-EU cross-border travellers are allowed to bring (indicative levels for personal use):

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

HMRC (2009) estimated that cross-border shopping in 2007/08 resulted in approximately £300 million lost in fiscal revenues. Approximately £650 million of potential fiscal revenues were lost to cross-border, fraud and smuggled alcohol in 2007/08.

Table 3.1: Revenues not collected (£ millions), 2002/03–2007/08

	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Total spirits fraud/smuggling	0–500	0–600	0–250	0–400	0–450	0–350
Cross-border shopping						
Spirits	150	150	150	150	100	100
Beer	50	50	<50	<50	<50	<50
Wine	300	250	250	200	150	150
Total revenue not collected	0–1000	0–1050	0–650	0–750	0–750	0–650

Source: (HMRC, 2009)

Research examining the direct association between increases in price (such as through increases in taxation) and changes in alcohol-related harm in a way bypass the issue of accounting for shifts to unrecorded consumption by focusing on the 'net' effect of a change in price; if a reduction in levels of harm is found after an increase in alcohol price, it is likely that overall consumption went down as well even if some shift occurred from recorded to unrecorded consumption.

3.3 Minimum pricing

Minimum prices for alcoholic beverages, also sometimes called Social Reference Prices, are used in very few places worldwide, most notably in several Canadian provinces (Alberta,

Ontario, Nova Scotia, British Columbia, etc) where minimum prices are set for either on- or off-trade venues. Although we have not identified any research assessing the impacts of this particular policy in these areas, there is strong evidence (summarised above) supporting the use of pricing policies in general to curb harmful and hazardous alcohol consumption.[18] Most relevant for minimum pricing as a policy to curb alcohol harms is the evidence that harmful and hazardous drinkers tend to choose the cheapest drinks, suggesting the importance of *minimum* as well as *average* alcohol prices.

3.3.1 Evidence on impacts

Even though interest in minimum pricing is growing across the EU, the impacts of implementing a minimum pricing policy are still mostly theoretical. We have not been able to identify any formal research assessing the effects of minimum pricing in the Canadian provinces in which they are used. At present, the most robust research available on the possible impacts of a minimum pricing policy come from the UK. A recent study (Brennan *et al.*, 2008) modelled the potential impacts of the introduction of a range of minimum prices. Impacts measured included those on consumption and expenditure by different types of drinkers, on fiscal revenue, industry profits, and alcohol harms in the areas of health, crime and employment. The study found that "[i]ncreasing levels of minimum pricing show very steep increases in effectiveness" in reducing alcohol harms across the three areas of health, crime and employment (*ibid*. p. 6; see also Purshouse *et al.*, 2010). For example, the study finds that a minimum price of 30p is estimated to reduce total crimes by around 3,800, the number of alcohol-related deaths by 302, and to avoid 3,800 cases of unemployment, whereas for a minimum price of 40p the reduction is estimated at 16,000 crimes, 1,381 deaths, and 12,400 cases of unemployment.

Another study from the UK examines the effect of the introduction of a 50p minimum price per unit of alcohol on consumption and the household budget of different groups of consumers (Record and Day, 2009). Assuming that spending stays constant after the introduction of the minimum price, the authors find that a 50p minimum price would have a greater effect on the 30 percent of the UK population consuming 80 percent of the alcohol; while the overall fall in off-trade purchasing would be 3.4 units a week, for the top 30 percent of consumers, the reduction would be 16 units a week (32 percent) (*ibid*). In addition, they assumed that the overall margins made by supermarkets would be unchanged so that with a rise in alcohol prices, the price of non-alcoholic products sold would decrease and that the increased profitability of alcohol would be exactly offset by a decrease in the profitability on non-alcoholic products. If there is no change in purchased volume by families, then the authors report that the net weekly effect on food and non-food expenditure would be a reduction in expenditure for the bottom 70 percent of drinkers, and an increase for the 30 percent consuming 80 percent of all alcohol (*ibid.*).

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[18] Some research has been conducted in the US on the effect of minimum tobacco prices, in place in 25 states. One paper indicates that the minimum pricing policy appears to have been designed "mainly to protect cigarette sellers with higher costs of doing business (for example, small, independently owned stores) from price competition from larger retailers with lower overhead (for example, chains, large discount stores)" (Feighery *et al.*, 2005). The paper indicates, however, that because the minimum price laws allow promotional incentives to be subtracted as trade discounts from the wholesale price before applying the retailer mark-up, prices may not be higher in minimum price states. In New York, the only state that banned these types of promotions, cigarette prices were significantly higher (*ibid.*).

3.3.2 Other effects of minimum pricing

The only research we could identify on other economic impacts of minimum pricing in alcohol comes also from the Brennan *et al*. (2008) study modelling the impacts of this policy in the UK, and Record and Day's 2009 paper also on minimum pricing. The Brennan *et al*. study examines the effect of different minimum prices on retailer revenue, on VAT and excise duty revenue, and in population expenditure on alcohol. Their results show that with price increases: spending is estimated to increase; changes in spending affect mostly harmful drinkers, with hazardous drinkers somewhat affected and moderate drinkers least affected; annual retail sales value is estimated to increase; and effects on tax and excise duty are estimated to be relatively small (*ibid*., pp. 122–123). The Record and Day paper examines weekly alcohol expenditure change with the introduction of a 50p minimum price, finding that while alcohol consumption would decrease, weekly expenditure would increase somewhat for the top 30 percent of alcohol consumers in the UK.

3.4 Bans on alcohol sales below cost

Bans on sales below cost are used in a small number of EU countries, including Poland, France, Spain, Italy, Belgium, Greece (for grocery goods), Hungary (for agricultural products) and Luxembourg, where legislation on commercial practices and consumer protection ban sales below cost (Ireland had such a ban as well, part of the 1987 Restrictive Practices (Groceries) Order, but this was repealed in 2006 (Rabinovich *et al.*, 2009; also Allain and Chambolle, 2004; Donnelly, 2006). In these countries bans on sales below cost apply to products generally, not specifically to alcohol. A number of states in the US have enacted bans on sales below cost on gasoline, tobacco and food staples such as milk (Anderson and Johnson, 1999).

Typically, the main aim of the policy when applied to products generally is to prevent anti-competitive (predatory) pricing, thus protecting small retailers and producers from the market power of large retailers (such as supermarket chains), and enabling new entrants into the market.[19] These types of bans do not set a minimum price for a product or products; rather, they ban the sale of products at a price below the seller's cost of doing business or some proxy thereof (for example below the cost of VAT plus excise duty of a particular product, or the unit price invoiced by the supplier).

3.4.1 Effects of a ban on alcohol sales below cost

We have not been able to identify research focusing specifically on the effects of this type of ban on alcohol-related issues (such as consumption, harms, impacts on the alcohol industry and so forth). However, researchers and public health practitioners have raised concerns about the use of below-cost sales and other price promotions and discounts in the

[19] It is worth noting that these arguments, which underlie the introduction of below-cost sales bans, are challenged by some economic literature. First, economic theory distinguishes between below cost sales and predatory pricing. A predatory price may be lower *or higher* than the cost price, thus not necessarily always leading to a sale below cost. In addition, there are many legitimate reasons why retailers sell products at below their cost price, such as the need to clear certain stock (eg when products are reaching their expiration date). Below-cost sales are not always motivated by anti-competitive interests (Colla, 2006).

marketing of alcohol. These concerns emerge from the strong evidence that price affects drinking and harm levels; below-cost sales and other sales promotions that make alcohol cheaper can lead to higher consumption and harms (Hastings *et al.*, 2005).

There is some research on the impact of general alcohol off- and on-trade price promotions and discounts (namely not looking specifically at below-cost sales) which can be informative, although this evidence base is not well developed (Hastings *et al.*, 2005). The Brennan *et al.* study (2008) modelled the possible impacts of different restrictions on off-trade price promotions and discounts in the UK, finding that tighter restrictions have increasing effects on alcohol consumption and harms, with a total ban on discounting leading to a 2.8 percent decrease in consumption a year (similar to the decrease from a 40p minimum price) (see also Purshouse *et al.*, 2010).[20]

Other studies on alcohol promotions and discounts have been conducted elsewhere, most notably in the US. A study estimating brand- and packaging-specific own- and cross-price elasticities for beer in the US found that volume-based price discounting in supermarkets induces people to buy larger-volume packages of beer and may lead to an increase in overall beer consumption, concluding that restrictions in volume-based price discounts are potentially effective at reducing beer consumption (Bray *et al.*, 2007). A well-known study of price promotions to US college students found that "[t]he availability of large volumes of alcohol (24- and 30-can cases of beer, kegs, party balls), low sale prices, and frequent promotions and advertisements at both on- and off-premise establishments were associated with higher binge drinking rates on the college campuses" (Kuo *et al.*, 2005). The study authors conclude that "[t]he regulation of marketing practices such as sale prices, promotions, and advertisements may be important strategies to reduce binge drinking and its accompanying problems" (*ibid.*). A third study focused on the effect of on-trade price promotions on intention to drink, finding that "lower prices generally lead to more favorable attitudes and intentions and increase the perceived likelihood of increased consumption" and that "[c]ompared with nonbingers, binge drinkers had higher patronage intentions and expected to consume more alcohol in response to the promotion" (Christie *et al.*, 2001, p. 245).

3.4.2 Other effects of ban on alcohol sales below cost

There is evidence examining how retail and manufacturer competition is affected by the introduction of a government-imposed price floor in a 'loss-leader' model. Chevalier *et al.*, (2003a) use supermarket data on the daily purchases of buyers, including quantity of beer purchased, and find evidence of a 'loss-leader' model of retailer competition. In particular, authors find retailers lower the price of particular products and this benefits the retailers because consumers purchase more of other products for which the price has not changed.

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[20] The different promotional restrictions modelled by the Brennan *et al.* (2009) study range from bans on 'buy one get one free' offers, bans on discounts of more than 30 percent (covering '3 for the price of 2' offers), bans on discounts only for lower-priced alcohol (less than 30p per unit), and a total ban on off-trade discounting. The data on off-trade discounts was taken from Nielsen, which use an industry-recognised method to determine if the price of an item is on promotion or not in any given week. This method consists of treating the highest price recorded over the previous five weeks as the regular price; if the regular price falls by 5 percent or more in a subsequent week, the item is classified as being on promotion. If the reduced price remains in place for more than four weeks it then becomes the new regular price (Brennan *et al.*, 2009).

Chevalier *et al.* (2003b) also find margins on beer fall during its peak demand periods. At first this seems counterintuitive; usually when demand for something increases, firms can increase the price and earn more profits. An initial thought is, therefore, that the lower margins are due to increases in costs and this is the reason for lower profit margins; perhaps manufacturers know that demand has increased so they increase the price of alcohol supplied to retailers. However, authors find the reduced profit margins have little to do with manufacturer behaviour and more to do with the increased advertising costs of the retailer.

Research on the economic impact of bans on sales below cost in markets other than alcohol is also limited (Marx and Shaffer, 1999). Most of the existing economic research focuses on explaining the use of these pricing strategies by industries (this literature is discussed in more detail in Chapter 7), and on distinguishing anti-competitive behaviour from pro-competitive price cutting (Marx and Shaffer, 1999; Allain and Chambolle, 2004). There is, nevertheless, some research on economic impacts. A recent study from the US does examine the economic impact of a ban on sales below cost of gasoline. The authors show that the ban (aimed to prevent predatory pricing by large establishments) may have protected a few gas (petrol) stations, especially independent and smaller ones, from going out of business (Anderson and Johnson, 1999). An important finding is that the ban on sales below cost (SBC) of gasoline (petrol) resulted in higher prices faced by consumers: "the difference between [retail] margins at locations where a gasoline-specific [sales below cost] law is present and where there are no SBC laws to be over 2 cents per gallon" (*ibid*. p. 8). While the Anderson and Johnson paper is inconclusive regarding the effect of SBC laws on smaller and independent retailers, at least one other study from North America suggests that these laws do not necessarily protect them from going out of business as a result of competitors' selling below cost (Johnson, 1999).

However, another study which uses monthly panel data from all 50 states over the extended period of 1983–2002 (thus overcoming a limitation of Anderson and Johnson's work, which focused primarily on a few cities or states and shorter-term effects), found evidence that five years after they were imposed, SBC laws actually lowered, rather than raised, petrol prices (Skidmore *et al.*, 2005). This was most likely due to decreases in market concentration; that is to say, the study's estimation results demonstrate that over the longer term (five years) the SBC laws increase the number of firms in the petrol market (*ibid.*). Their result supports the hypothesis that laws banning sales below cost help maintain fair competition by restricting predatory pricing practices. It is unclear, however, whether the findings from the retail of petrol are transferable to the retail of alcohol. In particular, while petrol is most often the main product retailed by individual firms, the retail of alcohol is often a small proportion of a company's overall business (eg in supermarkets or certain on-trade venues). In the absence of other measures to prevent this, it is therefore possible that large supermarket chains would be able to lower normal alcohol prices further in order to circumvent a ban on below cost sales.

In Europe, where a number of countries (including Belgium, France, Luxembourg and others) implement general bans on sales below cost, the research consensus seems to be that the bans increase retail margins and prices (for a short review of existing evidence on this, see Allain and Chambolle, 2009, pp. 7–8). For example, the French government had banned sales below cost for decades, but in 1996 legislation defining below-invoice retail

prices (*Loi Galland*) was introduced. This defines this threshold of below cost as the invoice price considering only the discounts written in this invoice. Biscourp *et al.* (2008) found that since the introduction of the *Loi Galland*, prices had increased more than when they were initially lower and that the legislation had led to an important reduction in intra-brand competition.[21]

Recent analysis has argued that the ban on sales below cost for retailers "enables producers to impose price-floors to their retailers" thus introducing higher prices on more products than those which would have been sold below cost (Allain and Chambolle, 2009, p. 2). This would suggest that the main price-increasing effect of a below-cost sales ban lies there rather than in the immediate positive effect of prices of products sold below cost (*ibid.*).

3.5 Summary of findings and gaps in existing research

The evidence presented above indicates that policies that increase the price of alcohol can be effective in reducing alcohol harms. However, the magnitude of these effects depend to a significant extent on the type of pricing policy used; an increase in excise duty rates may have a different effect than an increase in the minimum price of alcohol. The impacts of these policies in other areas, such as the level of unrecorded consumption, have not been as extensively examined.

Looking specifically at the three types of policies this study focuses on, the quality and extent of the available evidence varies widely. As mentioned above, there is robust evidence that the price of alcohol affects levels of consumption and harms at the population level, and that young, harmful and hazardous drinkers are responsive to price changes. Taxation has been extensively studied, and the balance of evidence shows that, when passed on to consumers, tax increases can be effective in reducing alcohol harms associated with hazardous and harmful alcohol consumption (such as liver cirrhosis, traffic accidents and deaths, crime and violence, etc). There is some international evidence on fiscally-induced cross-border shopping, which finds that tax and price differentials do induce some consumers (primarily those close to the border and in possession of a car) to engage in cross-border consumption.

The body of evidence on minimum pricing is considerably smaller than on taxation. Nevertheless, available studies modelling the effect of different levels of minimum pricing indicate that the policy can be effective in reducing consumption and harms, in particular as it specifically targets young, harmful and hazardous drinkers who tend to choose the cheapest drinks. The existing research also shows that minimum pricing would lead to increases in retailers' revenues. Research on minimum pricing, however, has not yet considered alcohol producers' and retailers' responses in greater detail, the policy's impact on employment, or its effect on the consumption of other goods (most notably tobacco and cannabis, which have been shown to be closely associated with alcohol use).

The literature on bans on alcohol sales below cost is the least developed; existing research has studied the effects of price promotions more widely than below-cost selling, finding

[21] More recently France introduced new legislation, the Chatel Act, stipulating that retailers can take every discount into account in defining the threshold of below cost. This Act was only introduced in 2008, so it is probably too early to effectively assess its impacts (Cliquet *et al.*, 2008).

that price promotions tend to increase consumption (including binge drinking) and intention to drink, and that restrictions on these promotions could be effective in tackling alcohol harms. However, the strong association between alcohol prices and alcohol harms provides a compelling reason for considering a range of pricing policies for inclusion into a policy mix to tackle this problem. The broader literature on bans on below cost sales (that is, not necessarily applied to alcohol alone) is more extensive but still has not explored the actual economic impacts of a ban on this practice in much detail, instead exploring the reasons why industries may use this marketing tool, and how to distinguish between anti- and pro-competitive below-cost sales. The few studies available from the US and Europe seem to suggest that bans on sales below cost increase prices without necessarily protecting smaller retailers, although a recent study on the longer-term effect on such bans shows that prices can actually go down.

This and the previous chapters summarised the existing evidence on the economic impact of taxation, minimum pricing and bans on sales below cost. The types of impacts on which there is greater uncertainty in the literature were highlighted. The following chapters use data from the UK to conduct a preliminary analysis of the potential economic effects of these policies, paying particular attention to the ways in which these policies could impact on producers, retailers and government.

CHAPTER 4

Data on the UK market for alcohol

In this chapter we describe the UK market for alcohol, providing important contextual information to understand the potential economic impacts in the UK of the three pricing policies examined in this study (more on this in the following chapters). The supply and the demand (or consumption) of alcohol affect the price we observe in the market; therefore we address each of these issues in this chapter.

4.1 Supply of alcohol in the UK

In order to review the potential economic impacts of a pricing policy, we start by providing basic descriptive, statistical information on those who supply the market for alcohol. We describe first the on-trade and off-trade statistics separately, and then compare the two.

Compared with HMRC data for total hectolitres cleared, the value reported in 2010 in the Report (2010) study comprises approximately 90 percent of HMRC clearance data. With more detailed data across drink types, we present Report (2010) information for on- and off-trade in this section.

4.1.1 On-trade

Between 2008 and 2009, the on-trade experienced decreases in supply (volume in 000s of hectolitres) with increases in the value of ale and cider supplied to market, but decreases in the value in £s of lager, stout, ready-to-drinks (RTDs), and spirits supplied (see Table 4.1).

Table 4.1: On-trade market, volume and value of sales, 2009

	Volume (000 hl)	Change between 2008 to 2009 (%)	Value (£m)	Change between 2008 to 2009 (%)	Equivalent consumer units
Lager	15,951	-6.8	7,537	-4.5	2,808 million pints
Ale	7,651	-3.8	3,036	0.8	1,347 million pints
Stout	1,735	-6.8	844	-2.9	305 million pints
Cider	2,906	-0.8	1,393	2.9	512 million pints
RTDs	464	-14.9	408	-12.8	169 million bottles
Spirit	614	-6.1	4,596	-0.7	2,456 million shots

Source: (Report, 2010)

Importantly for understanding economic impacts of the pricing policy options, when output falls, revenues do not necessarily fall. Particularly for ale and cider, there were decreases in volume sold and yet the total revenue (value sold) increased. On the other hand, volume sold and revenues fell for the other drink types. Although it is outside the

scope of this study, it would be interesting to perform more in-depth analysis to consider the role that price played in these changes and to see if increasing the price in some product markets, such as whisky, lager, etc, would actually increase the revenues (value of trade).

4.1.2 Off-trade

As seen in Table 4.2, the off-trade experienced a decrease in output of lager (-1.4 percent) and fortified wine (-6 percent) between 2008 and 2009. However, the value of the supply increased for all alcohol types. As in the on-trade, there is not an observable relationship between volume and value traded. While most products experienced increases in volume, all experienced increases in value traded. It would be interesting to pursue analysis in the off-trade for how decreases in volume for lager and fortified wine still resulted in increases in value traded, specifically the role of prices.

Table 4.2: Off-trade market, volume and value of sales, 2009

	Volume (000 hl)	Change between 2008 to 2009 (%)	Value (£m)	Change between 2008 to 2009 (%)	Equivalent consumer units
Lager	15,769	-1.4	2,882	2.6	3,584 million cans
Bitter/ale	2,230	0.2	480	6.4	523 million cans
Stout	512	2.7	115	3.7	116 million cans
Cider/perry	4,951	10.7	821	14.3	1,125 million cans
Fortified wine	498	-6.0	325	1.5	66 million bottles
Light wine	8,935	3.1	5,171	6.2	1,191 million bottles
Champagne	137	8.3	327	6.4	18 million bottles
Sparkling wine	426	4.8	326	10.6	57 million bottles
Spirits	2,125	2.4	3,190	5.7	304 million bottles
RTDs	527	1.0	204	2.4	192 million bottles

Source: (Report, 2010)

Specifically for lager, there were falls in volume both in the off- and on-trade. This is interesting for the policy options because elasticities described in earlier chapters indicate that changes in price affect consumption of spirits more than beer. Therefore, one would expect for any small change in price, there would be larger decreases in the consumption of spirits.

Furthermore, as we will show in Figure 4-7, there were greater increases in the retail price of whisky and fortified wine, than in pints or cans of lager. It would be interesting to disentangle the factors that led to changes in consumption of these products and the relationship to price. One factor, for example, may be income. A possible explanation is that those drinking lager were more affected by the recession and needed to reduce alcohol consumption by more than those drinking spirits, or lager drinkers turned to drinking spirits.

4.1.3 Comparing the on- and off-trade

For 2009, the Wine and Spirits Trade Association reported the revenue for the on- and off-trade in alcohol was £31.6 billion for products sold in the UK (WSTA, 2010). Based on the previous year, this was a decrease of 2.1 percent and an increase of 6.1 percent for the on- and off-trade, respectively.

The off-trade in general is a larger business in terms of overall volume and value; however, there are particular types of alcohol for which this was not true in 2009. As seen in Table 4.3, for the specific products for which we have figures in both the on- and off-trade, there is a greater volume of cider, spirits, and RTDs sold in the off-trade. As for the value of products sold, the on-trade is 'more valuable' (in monetary terms) for all product types.

Table 4.3: Comparing the levels of volume and value of sales in the on- and off-trade, 2009

	Volume (000 hl)		% difference in volume sold (on-trade compared with off-trade)*	Value (£m)		% difference in value sold (on-trade compared with off-trade)*
	On-trade	Off-trade		On-trade	Off-trade	
Lager	15,951	15,769	1.14%	7,537	2,882	61.76%
Bitter/ale	7,651	2,230	70.85%	3,036	480	84.19%
Stout	1,735	512	70.49%	844	115	86.37%
Cider/perry	2,906	4,951	-70.37%	1,393	821	41.06%
Spirit	614	2,125	-246.09%	4,596	3,190	30.59%
RTDs	464	527	-13.58%	408	204	50.00%
TOTAL	29,321	26,114	10.94%	17,814	7,692	56.82%

Source: (Report, 2010)

*A positive value indicates the on-trade is greater in value or volume than the off-trade.

The distribution of alcohol trade between the on- and off-trade sectors is changing rapidly; between 2008 and 2009, the on-trade experienced negative growth in volume sold, and for most alcohol types, in value sold; whereas for all but lager, there was positive growth in the off-trade. Table 4.4 shows these changes in more detail.

Table 4.4: Comparing the changes in levels of volume and value of sales in the on- and off-trade, from 2008 to 2009

	Change in volume sold between 2008 to 2009 (%)		Change in value sold between 2008 to 2009 (%)	
	Off-trade	On-trade	Off-trade	On-trade
Lager	-1.40%	-6.80%	2.60%	-4.50%
Bitter/ale	0.20%	-3.80%	6.40%	0.80%
Stout	2.70%	-6.80%	3.70%	-2.90%
Cider/perry	10.70%	-0.80%	14.30%	2.90%
Spirits	2.40%	-6.10%	5.70%	-0.70%
RTDs	1.00%	-14.90%	2.40%	-12.80%

Source: (Report, 2010)

4.1.4 Labour to supply alcohol

In order to supply this reported amount of alcohol to the market, various actors (for example producers, on-trade, off-trade, etc) employ workers. It is important to consider two aspects of employment in the alcohol industry:

- full-time equivalent employment; and
- direct versus indirect employment.

Full-time equivalent (FTE) employment captures the level of involvement of workers because the figure includes both the hours worked and the number of workers. One full-time worker amounts to 1.0 FTE; two part-time workers (20 hours per week in the UK), for example, amount to one full-time equivalent worker. According to the Institute of Alcohol Studies, the number of casual workers in the alcohol industry is currently unknown, so the number of full-time jobs is likely to be less than the number of jobs reported that does not take into account FTEs (IAS, 2007).

Direct employment refers to those who are directly involved in the production and distribution of alcohol; examples of direct jobs are brewers and alcohol sales representatives.[22] Indirect employment refers to jobs that supply products or services to alcohol producers and distributors; examples include bottle manufacturers, marketing executives and barley farmers.[23] Importantly, indirect jobs supply other industries as well, not just alcohol, and are therefore less affected by changes to the alcohol industry and implicitly, alcohol pricing policies.

Any figures regarding potential reduction in employment should take into account these groups of workers. The reason is that the implications of a reduction in employment will vary depending on whether those involved are 'fully' employed in alcohol employment.

According to the Gin & Vodka Association, it is estimated that the whole of the alcohol industry in 2009 "directly employed 650,000 people and more than a million in the wider economy" (GVA, 2010).

The figure regarding approximately 1.7 million workers refers to the number of people, not full-time equivalent workers. Some of the workers may be part-time and therefore have other jobs, outside the alcohol industry. We do not have statistics regarding full-time equivalent workers in direct and indirect employment across sectors of the alcohol industry. Therefore, the statistics we report may be considered over estimates of employment in alcohol.

Ernst & Young estimated the number of people working directly and indirectly in brewing and in hospitality and retail of beer across the European Union and its Member States in 2008 (Ernst & Young, 2009). Ernst & Young, 2009 estimate 397,200 people in total in the UK are employed in producing and retailing beer. In terms of the type of jobs in beer production and distribution, they identified the proportion of people working in retail, direct and indirect brewing, and hospitality jobs (Ernst & Young, 2009) as:

- 4 percent in retail
- 16 percent in direct and indirect, and
- 80 percent in hospitality.

As to spirits, the Gin & Vodka Association and Wine Spirits and Trade Association suggest there are approximately 60,000 people employed in the spirits industry.

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[22] Direct employment includes in the on-trade, off-trade and brewing.

[23] Indirect employment includes in agriculture, utilities, packaging, equipment, transport and media/marketing services.

Table 4.5: Estimates for the number of people employed in spirits, direct and indirect, 2009

	Direct	Indirect	Total
Gin and vodka	2,000	8,000	10,000
Scotch whisky	-	-	40,000
Other	-	-	10,000
Total	-	-	60,000

Sources: (GVA, 2010, WSTA, 2010)

As mentioned above, however, it is important to be cautious when interpreting these employment figures. First, these estimates generally refer to the total number of employees rather than the *full-time equivalent* (FTE) employees – so 10 people working 4 hours per/week are counted as 10 employees, rather than 1 FTE (40 hours/wk). Similar estimates for the tobacco industry were estimated by World Bank research to overstate the number of FTEs by 300 percent (Jacobs *et al.*, 2000), although no estimates are available for alcohol.

Second, if consumers spend less money on alcohol, then they have more money available to use in other ways (Godfrey and Hartley, 1990). Reduced employment associated with alcohol will therefore be counterbalanced by increased employment elsewhere in the economy; it is even possible that the net long-term effect is to *increase* the total level of employment in a country (see Baumberg, 2006), as has been estimated for reductions in tobacco consumption in certain countries (Jacobs *et al.*, 2000).

Even in these cases, there will be transition costs in the short-term (which could reduce long-term employment); these transition costs will be higher for more specialised jobs such as alcohol production, and lower for less specialised jobs such as retail assistants and in advertising (Baumberg, 2006). Looking at the Ernst & Young, GVA and WSTA estimates above, it is clear that the more specialised jobs are only a small part of the total number of jobs associated with alcohol.

4.1.5 Licensing and certificates to supply alcohol

The ONS provides statistics on the number of licences or certificates granted for the sales or supply of alcohol from 2007 to 2009 (as of March in each year). Figure 4-1 shows the proportion of licences or certificates held by the three main categories of holders – premises (for example on-trade, off-trade), clubs, and personal – over time. As the figure indicates, the proportion of licences held by individuals has been growing, with both the club premises and premises licences decreasing in proportion.

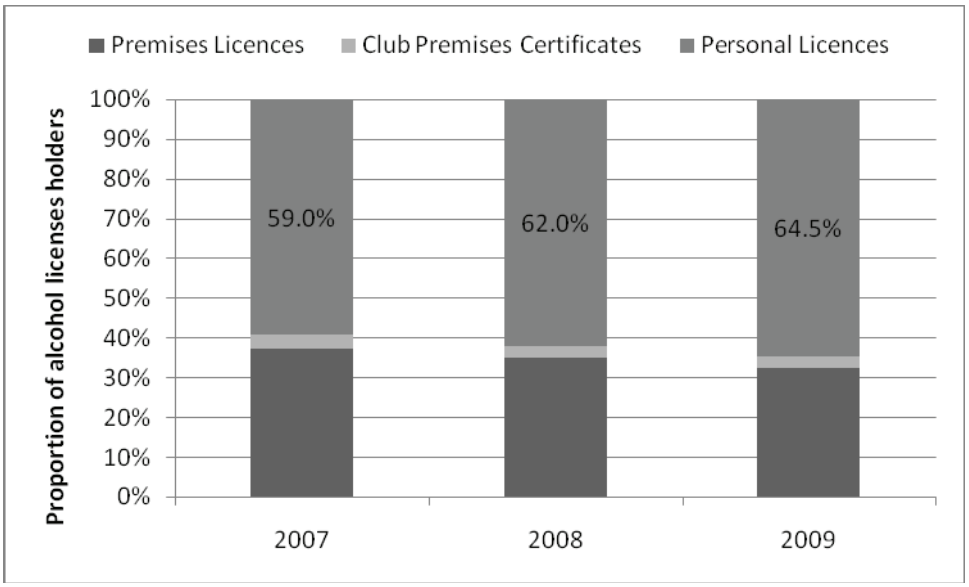

Figure 4-1: Proportion of alcohol licences, by holder type, 2007–2009

The ONS provides information regarding licences to sell alcohol at on-trade premises only and at off-trade premises only, as well as licences that permit the sales of alcohol in both on- and off-trade premises. Figure 4-2 shows that the most prevalent licences are for sales at both on- and off-trade premise. It is not possible to know from these statistics why this may be, although it is possible that the price of an on-/off-sales licence makes it worth leaving open the possibility to sell at either location. On the other hand, the only one of the three licence types to increase from 2008 to 2009 was the off-sales licences. This seems consistent with the earlier table comparing on- and off-trade revenues (Table 4.3) in which the off-trade experienced positive growth greater than that of on-trade.

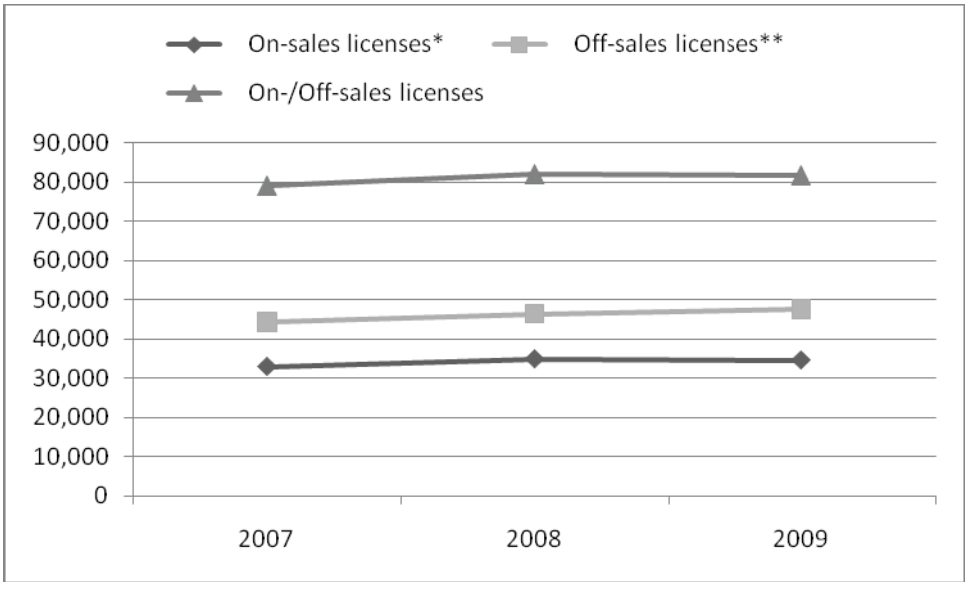

Figure 4-2: Proportion of alcohol licences, by holder type, 2007–2009

Whether the trends in licence and certificate applications are due to changes in prices is well beyond the scope of this research; however, further research into how prices alter

applications for licences and certificates may be an important aspect of the economic impacts of alcohol pricing policies. In particular, the extent to which supply might be constrained through licensing provisions is important because the applications facilitate government revenue.

4.2 Demand for alcohol in the UK

Following the brief description of those groups supplying alcohol, we turn to statistics on those demanding alcohol. We first describe overall demand, in terms on quantity consumed and expenditure. We then focus on consumption by two key groups of interest to the Home Office – different income groups and drinker types (for example moderate, hazardous, harmful levels of consumption).

4.2.1 Demand per capita

Data from the HMRC indicates demand, in terms of total litres of alcohol consumed per capita, in the UK increased from approximately 9.5 litres per capita to its highest point in 2004/05 of 11.8 litres, and falling most recently in 2008/09 to 10.7.

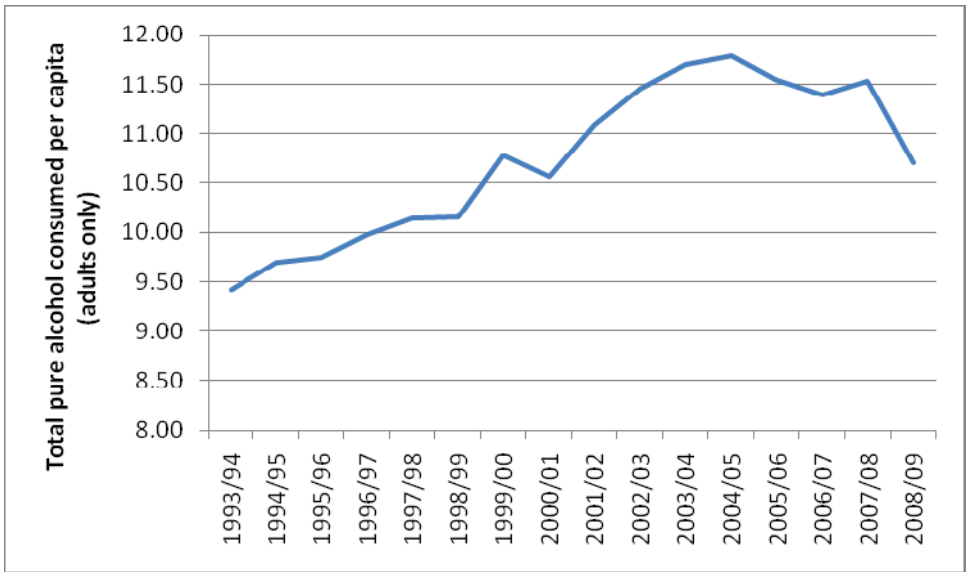

Figure 4-3: Amount of pure alcohol consumed per capita (in litres), 1993/94–2008/09

Source: (HMRC, 2010a)

The most recent data (from 2008) indicates that average expenditure on alcohol was approximately £6.40 and £7.20 in the off-licence/supermarket and on-licence respectively.

4.2.2 Demand by household income

In terms of pounds sterling, the lowest ten percent income group spent £2.40, the highest income group spent £11.40, and all households spent on average £6.20 on alcohol to be brought home (in off-licence and supermarkets) in 2008 (ONS, 2009).

In terms of how this is spent, the lowest ten percent income groups spend more on beer/lager/ciders/perry than on other alcohol types. For all households on average, more money is spent on wines than other alcohol types. Importantly for this study, we later present average retail prices of all alcohol types and we see that the per unit price of wine,

beer, and spirits are fairly similar; however, the total retail price of particular alcohol products varies.

Table 4.6: Weekly expenditure on alcohol (£), by alcohol type, 2008

	Lowest ten percent	All households
Spirits and liqueurs	0.50	1.40
Wines, fortified wines	0.90	2.20
Beer, lager, ciders and perry	1.00	1.50
Alcopops	0.00	0.10

Source: (ONS, 2009)

Figure 4-4 displays the proportion of weekly income spent on alcohol in the off-licence and supermarkets. While statistics indicate that low income households spend proportionally the same amount of income on alcohol (in off-licence and supermarkets) as higher income households,[24] there is an exception in which the lowest income group spends proportionally double that of the other income groups.

There are several potential reasons for this. It may simply be due to the way in which we had to construct the figure; we are provided with the weekly income range for each decile and to calculate the proportion of income spent on alcohol, we divide the average amount that each decile group spends on alcohol per week by the weekly average income over the range of the decile. For the lowest income group, the true average income may be higher than the figure we used, since we had to average over £0 to £196. We assume a normal distribution over each income decile. However, it may be the case that the lower income group is more skewed, with fewer people earning such low incomes; in that case, we have underestimated the income, thereby overestimating the proportion spent on alcohol. On the other hand, the weekly pounds sterling amount spent on alcohol (in off-licence and supermarkets) by the lowest decile income group is 29.1 percent less than the pounds sterling spent by those in the second decile income group; the median income group spends 15.4 percent (less in pounds sterling) than those in the sixth decile group. Furthermore, the highest income group did not have a 'cap' and the proportion spent on alcohol should be considered an underestimate. Therefore, the lowest income group do appear to spend proportionally more than other higher income groups.

[24] Income deciles are provided in brackets (ie the second decile earns £197 to £259 per week). We use the average over the range. For the lowest decile, we use the average over £0 to £196; for the highest decile we use the lowest value because we only know they earn £1,196 and over.

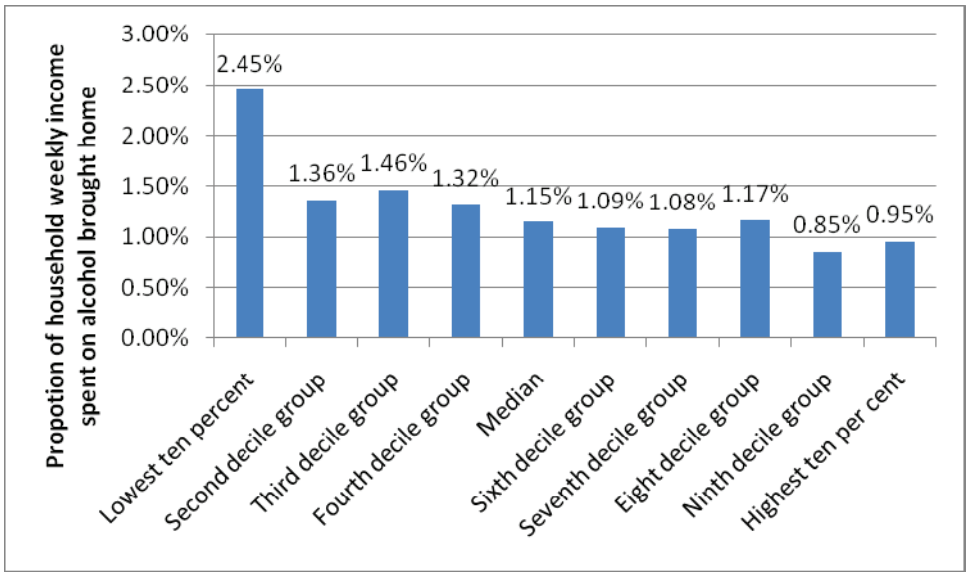

Figure 4-4: Proportion of gross weekly equivalised household income spent on alcohol, by income decile group, 2008

Source: (ONS, 2009). Note the highest ten percent and the lowest ten percent may be an overestimate. The amount of alcohol purchased includes households spending £0 on alcohol.

For low-income groups to spend proportionately the same amount as higher-income groups, it must be the case that either:

- low-income groups purchase the same amount of alcohol as high-income groups at a lower price; and/or
- low-income groups purchase less alcohol than high-income groups at the same price.

To identify if it is one or both of these we need data on the amount of alcohol each group purchases and the prices paid by income groups. As mentioned in Chapter 2 above, a recent paper uses UK Expenditure and Food Survey data to assess purchasing patterns of cheap alcohol across income groups (Ludbrook, 2010). The paper finds that all income groups, and not just the lowest income group, purchase low price alcohol in the off-trade sector. The paper also finds that there is little difference between the amount of lowest priced alcohol (below 30p per unit) purchased by the lowest and middle income groups, although they do buy more of this than the highest income group (*ibid.*).

The General Household Survey for 2007 reports wealthier people demand more alcohol in single sittings; specifically, a higher proportion of wealthier households binge drink as compared with low-income groups (as shown in Figure 4-5). Further, statistics indicate that all the socio-economic groups consume approximately the same number of units. This suggests that the former bullet point above (over a given period, low-income groups purchase the same amount of alcohol as high-income groups at a lower price) is more accurate. In this case, increasing the price of alcohol is likely to affect low-income groups more than high-income groups.

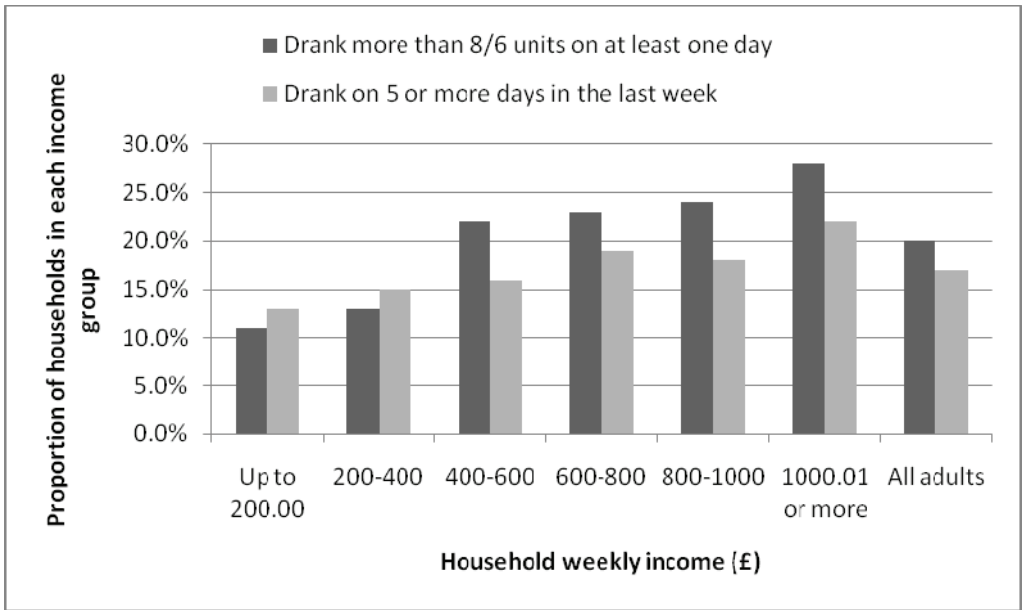

Figure 4-5: Proportion of households engaging in binge and habitual drinking, by weekly income, 2007

Source: (Centre, 2009). Note that 8/6 units refers to maximum number of units recommended per week for men/women.

This finding is further supported by the recent report from the London School of Economics, which finds better educated women "appear to be the ones who engage in the most problematic patterns of alcohol consumption" (Borgonovi and Huerta, 2010:18). The authors suggest this may be due to better-educated women having more active social lives, delaying childbirth, and facing different cultural norms for the consumption of alcohol. Assuming higher educated women have higher incomes, the pricing options may not have the effect of reducing harms of this specific group.

4.2.3 Demand by hazardous/harmful drinkers

According to the General Household Survey, in 2002, 22 percent of drinkers consumed more than 14(female)/21(male) units per week. Those 22 percent of drinkers consumed nearly 70 percent of all alcohol (Baumberg, 2009), meaning the bulk of alcohol is consumed by a minority of people who drink to hazardous and harmful levels. Given the average amount of alcohol consumed annually from 1998/99 to 2008/09 was 77.8 million hectolitres, as reported by HMRC (HMRC, 2010a), hazardous/harmful consumers consumed, on average, 54.5 million hectolitres and moderate consumers consumed 23.3 million hectolitres annually.

Importantly for this study, this suggests the bulk of the impact of price changes would be on hazardous/harmful consumers. Since moderate drinkers purchase 30 percent of alcohol, the magnitude of the effect of the pricing policies is relatively limited compared with the effect on hazardous/harmful drinkers.

4.3 Prices of alcohol in the UK

As discussed earlier, price is an indicator of the relationship between supply and demand for a product and is the key policy tool under consideration in this study. In this section, we consider general alcohol prices over time and then we present retail prices of specific alcohol products, such as whisky, lager, etc, in the UK and in a particular region (North East) for which retail prices in the major supermarkets and discount stores were collected[25]. Lastly, we consider overall prices (not just alcohol) and the effect that changes in alcohol prices may have to alter the rate of change of overall prices (that is, inflation).

4.3.1 Alcohol prices over time

Prices are information and act as an indication of the relationship between the supply and demand for a good (for more on how prices are determined, see Appendix A). An indicator generally used to identify overall price changes is the Consumer Price Index (CPI). In particular, according the UK Office of National Statistics,

> "The Consumer Prices Index (CPI) has been designed as a macro-economic measure of consumer price inflation. It forms the basis for the Government's inflation target which the Bank of England's Monetary Policy Committee is required to achieve. It has been developed according to internationally agreed rules and is internationally known as the HICP (the HICP is used for international comparisons of inflation)."[26]

Using the monthly CPI for all goods (where 'the basket of goods' is determined by the Office of National Statistics) and the consumer price index of alcohol[27] across the UK, Figure 4-6 shows that the overall price of consumer goods has risen annually since 1996; the price of alcohol, on the other hand, has remained relatively stable, with some increase after 2005. As we describe later, this is consistent with the market structure of alcohol.

[25] By Balance, 2010.

[26] http://www.statistics.gov.uk/cci/nugget.asp?id=181 (as of 16 June 2010).

[27] Beer, wine, and spirits at both on- and off-sales.

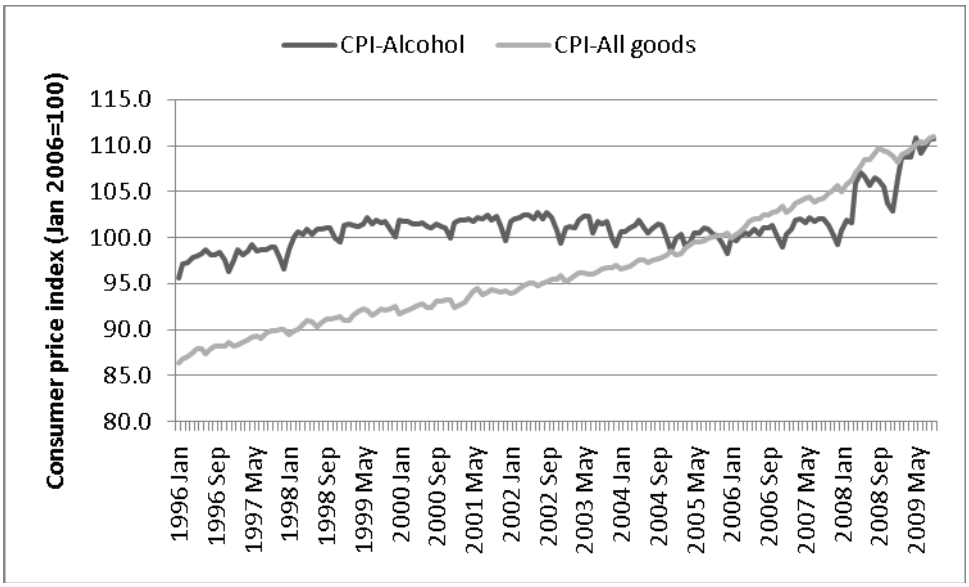

Figure 4-6: Consumer price index for alcohol and all goods

Source: Office for National Statistics, 2009

Although the trend for alcohol prices is relatively stable, since 2005 the overall price of alcohol has risen. This may be an important increase in that the CPI is a measure of inflation (the general price of goods and services), whereby increases in inflation mean each unit of currency buys fewer goods. If increases in alcohol prices contribute to increased inflation (implying alcohol is a significant enough product in the economy to influence overall prices), then each pound sterling is less valuable when alcohol prices increase. We discuss this further after going into some detail on retail prices of alcohol.

4.3.2 Average retail prices

The HMRC reports average retail prices of eight alcohol products as collected by the Office for National Statistics for the retail price index (see Table 4.7). Given the average retail prices and the average alcohol by volume (ABV) for each product reported by the HMRC, the average per unit price of pure alcohol (hereafter called 'per unit price') in the form of spirits, beer, and cider (not including pints) in 2009 was £0.24–£0.48. Pints of beer are approximately £1.10–£1.15 per unit.

Table 4.7: Average retail price of alcohol in the UK, by type of drink, 2009

Drink type	Average retail price (£)	Average ABV (%)*	Average retail price per unit of pure alcohol**
Whisky (70cl bottle)	13.35	40	0.48
Vodka (70cl bottle)	11.53	35	0.47
Table wine (75cl bottle)**	3.59	11.5	0.42
Fortified wine (70cl bottle)**	5.62	18	0.45
Pint of beer (Lager)	2.67	4.1	1.15
Pint of beer (Bitter)	2.32	3.8	1.07
Lager (4 x 440ml cans)	3.06	3.9	0.45

Drink type	Average retail price (£)	Average ABV (%)*	Average retail price per unit of pure alcohol**
Cider (Litre bottle)	1.81	7.5	0.24

Source: (HMRC, 2010a). * The ABVs used are the same as used in (HMRC, 2010a). ** A 'unit' of alcohol is calculated as: (millilitres * %ABV)/1000. UK pint=568 millilitres. *** From retail outlet.

We are unable to locate information in the Office for National Statistics regarding where the retail prices were collected; however, we assume the bottle and can prices are from off-licence and supermarkets, while pints are from on-licence. Under this assumption, generally speaking, the off-licence and supermarkets would be relatively more affected by a £0.40–£0.50 minimum price than the on-licence. This is a general statement as on-licence do have promotions that would be affected by a £0.40–£0.50 minimum price. We discuss this further in Chapter 7.

As a reflection of per unit prices in particular regions of the UK, unit prices of several brands of alcohol across supermarkets and discount supermarkets (Aldi, Lidl) were collected in the North East (Balance, 2010). As suggested in Table 4.8, main and discount supermarkets provide most alcohol at similar prices. The main difference is between own-brand and major brands, in which the prices of own-brand products are approximately 25 percent lower than the price of major brands.

Table 4.8: Mean per unit prices for alcohol (£), North East of England

	Own brand		Major brand	
	Main supermarkets	Discount supermarkets	Main supermarkets	Discount supermarkets
Beer	0.28 (0.05)	0.37 (0.05)	0.48 (0.11)	0.49 (0.09)
Wine	N/A	0.41 (0.09)	0.51 (0.18)	0.42 (0.15)
Spirit	0.29 (0.02)	N/A	0.44 (0.07)	0.37 (0.07)
Cider	0.19 (0.62)	N/A	0.39 (0.24)	0.26 (0.16)

Source: (Balance, 2010).

Note: Standard deviations in parenthesis.

An interesting point here is that the current difference between own-brand and major brand in main supermarkets of the North East is approximately £0.20 per unit, with own-brands sitting at approximately £0.30 for own-brand and £0.45–£0.50 for major brand. Relatively speaking, therefore, a minimum price of £0.30 is unlikely to change anything as most prices other than cider are already priced around £0.30 per unit of alcohol. In further chapters, therefore, we discuss a £0.40 and £0.50 minimum price option.

As to trends in average retail prices, they were generally stable (as indicated overall by the price of alcohol index shown in Figure 4-6), particularly from 1991 to 2006. Since 2006, some prices have been increasing, particularly whisky and fortified wine.

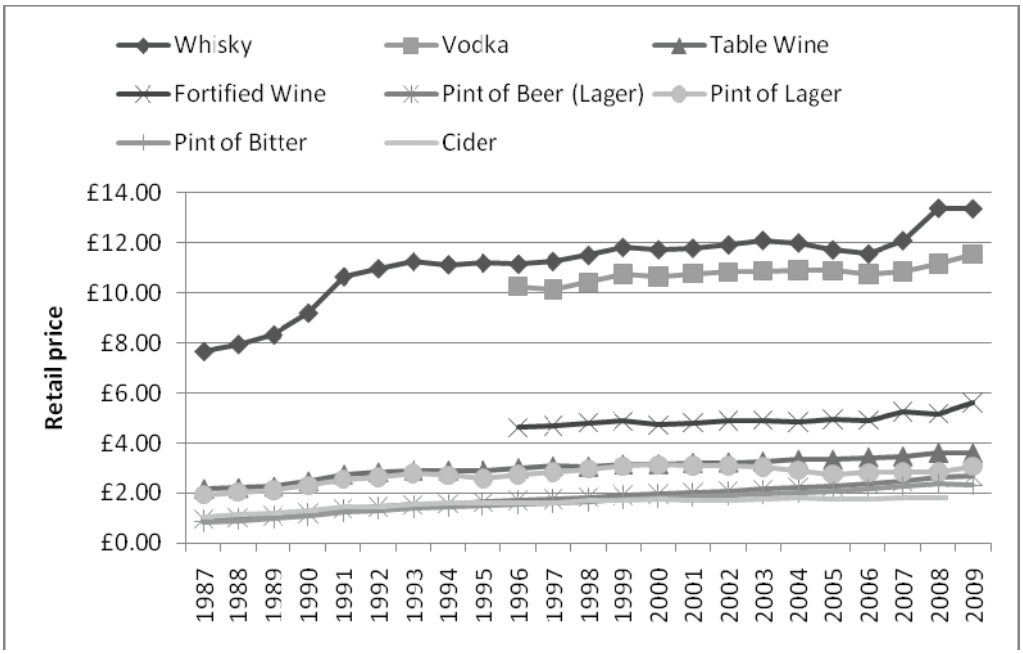

Figure 4-7: Trends in average retail prices, by alcohol type, 1987–2009

Source: (HMRC, 2010a).

Note: Retail prices used to derive the Retail Price Index. In terms of alcohol sizes, vodka (70cl bottle), table wine (75cl bottle), fortified wine (70cl bottle), lager (4 X 440ml cans), and cider (litre bottle).

4.3.3 Inflationary contribution of alcohol

Increases in alcohol prices due to the policy options can have an effect on the national, overall measure of price changes (inflation). This is important because the Bank of England's Monetary Committee has an inflationary target that it must meet and has exceeded since December 2009. If alcohol price increases affect overall price increases, there may be pressure from the Bank of England not to implement these pricing policies.

According to the Office for National Statistics, increases in alcohol prices had an effect on inflation. As of March 2010, one of the "small upward contributions [to overall inflation in the UK, as measured by the rate of change in the 12-month CPI, was due to] alcoholic beverages and tobacco, where the main effect came from wines, particularly white wines which rose in price this year but fell a year ago" (ONS, 2010:6).

Another index used to identify inflation is the Retail Price Index (RPI). In practice the RPI and Consumer Price Index (CPI) are relatively similar, with the main difference in the area of housing costs (for differences in the RPI and CPI, see ONS (2007a)). According to the Office for2 National Statistics,

> "The Retail Prices Index (RPI) is the most familiar general purpose domestic measure of inflation in the United Kingdom. It is available continuously from June 1947. The Government uses it for uprating of pensions, benefits and index-

linked gilts. It is commonly used in private contracts for uprating of maintenance payments and housing rents. It is also used for wage bargaining."[28]

As of March 2010, the ONS states that one of the "large upward contributions [to the RPI] came from...alcoholic drink driven by wines and spirits off sales where, overall, prices rose by more than a year ago with the main effects coming from whisky and white wine" (ONS, 2010:8).

Importantly for this study, the Bank of England's (BoE) Monetary Committee has an inflation target of 2 percent, expressed in terms of an annual rate of inflation based on the CPI.[29] The CPI does include taxes, thus all policies can potentially have an impact on the inflationary measures. As we show below, according to the ONS, alcohol price increases can increase overall prices and given the BoE's target, it may be an important factor to consider.

There are two significant issues to consider in this estimate. First, the impact of recent increases in excise duties on inflation "assumes duty changes are passed on in full to consumers as soon as they come into effect".[30] As we demonstrate in Chapter 7, this is unlikely to be the case. Second, the calculations are based on how much of each commodity is purchased, as a proportion of the total consumption 'basket' (in the Family Expenditure Survey). This proportion, or 'weight', is then applied to the commodity's price index. Therefore, any changes in consumption following the tax increase (and any subsequent price increase) are not taken into account. Because these calculations do not typically take resulting consumption changes into account, they over-estimate the inflationary effect of the tax increase.

In any event, as shown in Table 4.9, the estimated total effect on the one-month change in the CPI was a 0.30 percentage point increase. The largest impact for a single increase was due to the March 2010 increase in excise duty on alcohol – 0.08 percentage points increase in total inflation. Relative to the BoE's 2% target, the potential increase in alcohol prices was 4 percent of the BoE's inflationary target.

Table 4.9: Estimated impact of change in VAT and duty of 2009 on CPI

Excise duty (timing of effect)	Percentage points contribution to one-month change in the CPI
Tobacco (24 Mar 2010)	0.06
Alcohol (29 Mar 2010)	0.08
Road fuel (1 Mar 2010)	0.04
Road fuel (1 Oct 2010)	0.04
Air passenger duty (1 Nov 2010)	0.05
Road fuel (1 Jan 2011)	0.03

[28] http://www.statistics.gov.uk/cci/nugget.asp?id=21 (as of 17 June 2010).

[29] "The remit is not to achieve the lowest possible inflation rate. Inflation below the target of 2% is judged to be just as bad as inflation above the target. The inflation target is therefore symmetrical" http://www.bankofengland.co.uk/monetarypolicy/framework.htm (as of 17 June 2010).

[30] http://www.statistics.gov.uk/cci/nugget.asp?id=336 (as of 17 June 2010).

Excise duty (timing of effect)	Percentage points contribution to one-month change in the CPI
Total effect	**0.30**

Source: Office for National Statistics

It is worth noting that there is another measure for prices that does not include taxes, known as the 'Consumer Price Index, excluding indirect taxes' (CPIY). The CPIY is designed to measure underlying prices and excludes price changes directly due to changes in indirection taxation. Therefore, it may be possible to focus on another index in which minimum pricing and a ban on below-costs sales would have an impact, but taxation would not. However, this has been attempted before unsuccessfully with regard to alcohol. In Ireland in the 1970s, there was concern for moderating the rate of inflation and government faced serious challenges to increasing excise taxes that would have been necessary to maintain the real value of alcohol (Walsh, 1989). This led to the introduction of the CPIY, but this measure has never gained any serious credence and the BoE still uses the CPI for its inflationary target. "The impact of excise taxes on the inflationary spiral remained a serious constraint on the behaviour of the government" (Walsh, 1989:1167). So while it seems as if a strategy for circumventing inflation issues is to focus on an index that does not take into account taxation, it appears this strategy has been unsuccessful in the past.

4.4 Government revenue

In terms of duties collected per litre, this has been increasing over the last four years. The annual rate of change for duties collected over the period 1993/94 to 2008/09 was 1.6 percent. The figure shows by how much the HMRC has been increasing duty rates per litre of alcohol consumed per capita.

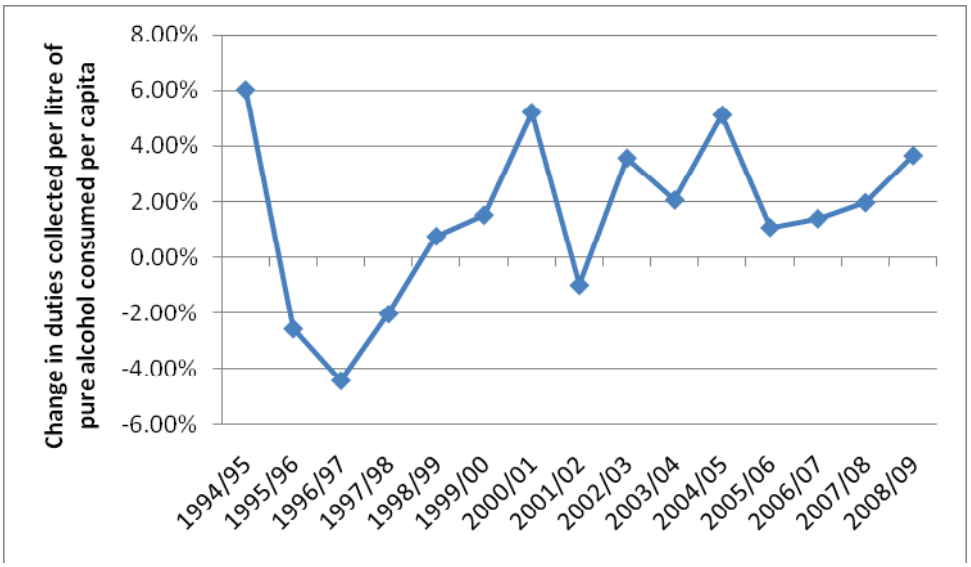

Figure 4-8: Change in duties collected (%) per litre of pure alcohol consumed per capita

Source: (HMRC, 2010a)

In terms of how much this accounts for in total, HM Revenue and Customs collected £8.4 billion (2009 prices) in alcohol duties for the 2008/09 financial year. The overall trend is increasing receipts with a 3.8 percent reduction on the previous year (see Figure 4-9).

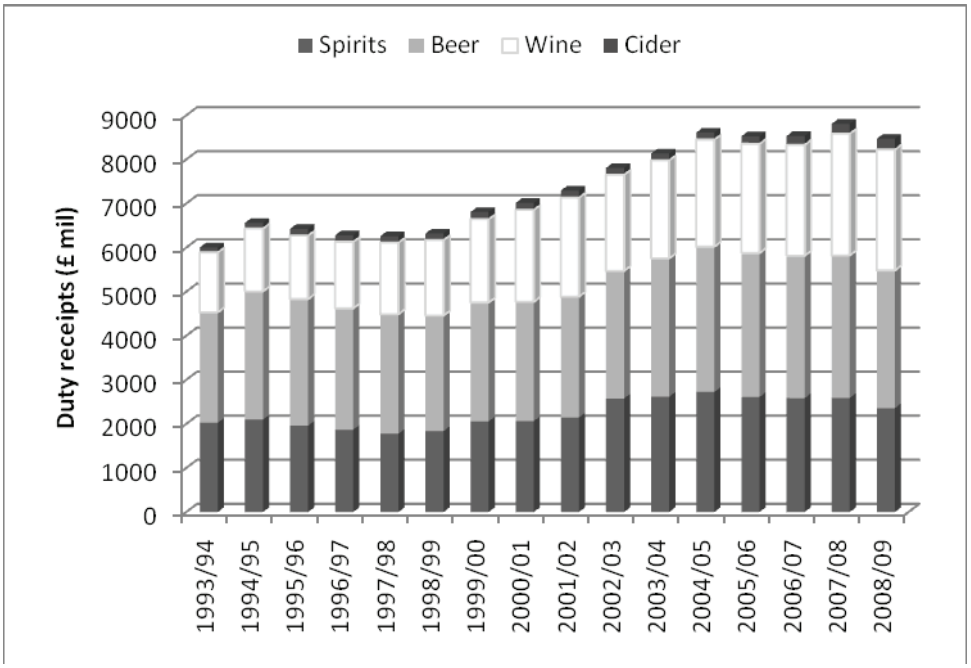

Figure 4-9: Duty receipts collected (£ millions), by year

Source: (HMRC, 2010a)

With potential increases in duty rates, we present a figure plotting the average change in excise duties across alcohol types and the change in litres consumed. It is worth noting that the UK uses a system of bonded warehouses, whereby goods are stored in a bonded

warehouse or other approved store without payment of duty, which is suspended until they leave the warehouse. This means that the consumption of alcohol is likely to correspond to the same year in which duties are paid (this is not true of other European countries).

Figure 4-10 plots the changes in consumption and average change in excise duty rates; each point represents the change in consumption and excise duty rates for one particular year. We add a trend line to understand the potential relationship between change in consumption and excise duty rates. The figure suggests that in years during which there was positive growth in excise duty rates, there was lower growth in consumption.

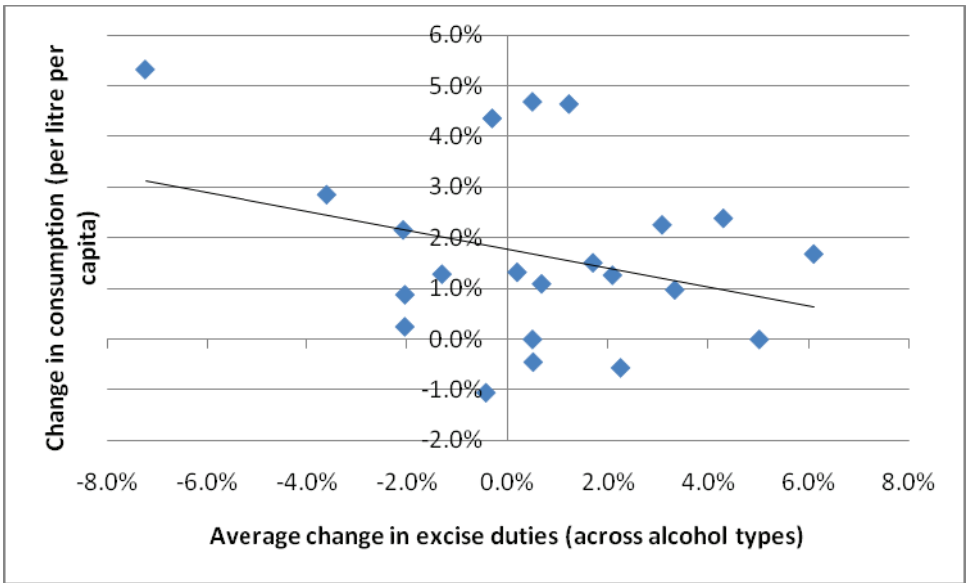

Figure 4-10: Consumption levels and excise duties, 1987/88-2008/09

Source: (HMRC, 2010a).

Notes: Note the series is 1987/88–2008/09 for consumption and 1988–2009 for duties.

Importantly, an issue to consider regarding tax collections is cross-border purchases and whether the changes in prices may alter incentives to purchase within the UK and thus tax revenue. First, it is important to consider whether, in a common currency, the prices are actually different. It may be that exchange rates are such that the pounds sterling price of alcohol in France, for example, is not that different from the price in the UK. (The reason that this happens is known as the law of one price, which states that when taking into account exchange rates, the price of a given commodity or asset will be the same.)

There are a number of factors influencing cross-border alcohol consumption. They are not necessarily independent of each other and include:

- **Price differential**. Taking into account exchange rates, transport costs, and travel-related expenses, if the actual price is lower in a foreign country there will be incentive to cross-border purchase.
- **Responsiveness of consumers**. When individuals are not willing to reduce consumption, then an increase in the price differential may increase an individual's incentive to purchase alcohol where it is less expensive.

- **Preferences of consumers**. When the proportion of consumer expenditure devoted to buying alcohol is high, then consumers may see alcohol as an important good compared with other goods and an increase in the true price may provide an incentive to consumers to purchase across a foreign border.

4.5 Summary

In this chapter, we present data to describe the UK market for alcohol in quantitative terms. The chapter focused on the demand and the supply for alcohol in the UK, alcohol prices, and the government involvement (in terms of tax revenue) in the market for alcohol.

Regarding demand, because harmful and hazardous drinkers in the UK consume 70 percent of all alcohol, the bulk of the impact of price changes would be on hazardous/harmful consumers. Since moderate drinkers purchase 30 percent of alcohol, the magnitude of the effect of the pricing policies is relatively limited compared with the effect on hazardous/harmful drinkers. Evidence cited in Chapters 2 and 3 also indicates that policies that increase the price of the cheapest drinks (like minimum pricing and a ban on sales below cost) affect hazardous and harmful drinkers more than moderate drinkers because the former tend to consume more of the cheapest drinks.

In terms of the supply of alcohol, one of the key findings in this chapter is that there have been changes in the value and volume of alcohol sold in the on- and off-trade, respectively. The on-trade experienced negative growth in volume sold, and for most alcohol types, in value sold. On the other hand, for all but lager, there was positive growth in value and volume in the off-trade.

Using the monthly consumer price index for all goods and for alcohol[31] across the UK, we find that while the overall price of consumer goods has risen annually since 1996, the price of alcohol has remained relatively stable, with some increase after 2005. This corresponds to findings related to supply and demand of alcohol in which demand since 1996 was at its highest point in 2004/05 and has been falling since. Meanwhile, the overall value of most alcohol products supplied increased, indicating that prices went up by more than the output decreased. The extent to which revenue increases could continue with the introduction of pricing policies would need in-depth analysis and only suggests that alcohol pricing policies may reduce consumption and increase revenues. We discuss how this can happen in more depth in the next chapter.

With regard to inflation, the change in inflation due to a change in alcohol prices clearly depends on the price and tax rate. The recent increase in duty was estimated to increase inflation, although these estimates, by not taking resulting changes in consumption into account, are likely to over-estimate this inflationary effect.

[31] Beer, wine, and spirits at both on- and off-sales.

CHAPTER 5 Alcohol producer and retailer relations

In this chapter, we describe how industry may respond to different pricing interventions. Based on insights from the literature reviewed in the first two chapters of this study, as well as from secondary data and interviews with academics, producer representatives, and retailer representatives, we describe how producers and retailers (off- and on-trade, supermarkets and pubs in particular) may be affected by the pricing interventions.[32] Lastly, we interrogate the potential implementation costs of such policies for government, retailers and producers.

5.1 The market for alcohol

An important consideration of how the pricing policy options may translate into practice is the structure of the market for alcohol. In this section, we outline general market structures and use data to identify the particular market structure for alcohol in the UK. We then describe what may be driving this particular market structure for alcohol.

5.1.1 Market structure

The market structure shapes how suppliers adjust their output according to price. There are essentially four types of markets, described below, and each has specific associated characteristics.

Table 5.1 provides general information on each market structure type and their associated characteristics. For the purposes of the responses to potential pricing policies, the last column is particularly important. In the last column, the table lists the responses for each type of market to a price control, specifically a price floor or price ceiling. The two relatively extreme responses are perfectly competitive and monopoly markets. We can see that in a perfectly competitive market, a small change in price can lead to large changes in output; the degree to which this happens depends on consumers. In a monopoly, a price change, such as the introduction of minimum pricing or a below-cost sales ban, would lead to minimal changes in output, if at all; the ultimate decision would be up to the monopolist firm.

[32] There are other groups, such as wholesalers, that may be interesting to analyse. However, given the resources of this study, it was not possible to include them all. Instead, the study examines a smaller number of key actors in greater depth.

Table 5.1: Market structure types and characteristics

Type of market structure	Number of businesses	Nature of product	Five-firm concentration ratio	Output response of price controls[33]
Perfect competition	Very many	Various	0%	Highly responsive, consumer driven
Monopoly	One	Unique	-	Highly unresponsive, firm driven
Monopolistic competition	Many	Differentiated	<40%	Relatively responsive
Oligopoly	Few	Similar	>40%	Relatively unresponsive

One way in which we can determine the market structure for the manufacture and/or production of alcohol is to consider the four- or five- 'firm concentration ratio', which is the percentage of the value of total sales accounted for by the four or five largest firms in an industry. It is a way of measuring the concentration of the market share held by particular suppliers in a market and the rule of thumb is that any industry with over 40 percent market share is considered an oligopoly and less than 40 percent is monopolistic competition (Mahajan, 2006a).

The Standard Classification of Industries (2003) system assigns codes to sectors of industries (or NACE codes Rev. 1.1) and thus allows for the systematic comparison of an industry over time and across industries. The industry classification that includes alcoholic beverages is formally classified as 'alcoholic beverages – alcohol and malt' and includes a range of beverages[34].

The latest available information we located is for 2004. As of 2004, 'alcoholic beverages – alcohol and malt' (referred to as the alcohol industry) would be relatively weakly considered an oligopoly as five businesses owned almost 70 percent in terms of the value of the goods produced measured as gross value added (GVA) (for more on how oligopoly markets behave see Appendix A). Gross value added of each industry is summed with tax on products, less subsidies on products to derive gross domestic product (GDP). For the most part, these codes seem to refer to producers of alcoholic beverages; however, if retailers are also engaged in producing or manufacturing alcoholic beverages then they may be included. It would be useful to distinguish between producers and retailers; however, this is not a recognised distinction in the classification system. Searches for literature and data on market concentration separated distinctly by producer and/or retailer in the alcohol industry did not yield relevant data and statistics.

As compared with other UK industries in 2004, alcohol is not as concentrated as the tobacco industry, but it is more so than 'Other food products' (Table 5.2). The alcohol

[33] Price controls are price ceilings (maximum price) and price floors (minimum price) set by government.

[34] 15.91 Manufacture of distilled potable alcoholic beverages; 15.92 Production of ethyl alcohol from fermented materials; 15.93 Manufacture of wines; 15.94 Manufacture of cider and other fruit wines; 15.95 Manufacture of other non-distilled fermented beverages; 15.96 Manufacture of beer; 15.97 Manufacture of malt.

industry is more approximately comparable with the 'Soft drinks and mineral waters' industry. It has not always been this way, however; as Text box 5-1 describes, the alcohol industry used to be more concentrated in the hands of fewer businesses.

Table 5.2: Market share across a selection of industries, in terms of value of trade*, 2004

	Top 5 businesses (as % of the total)	Top 15 businesses (as % of the total)	Ranking of the top five businesses in all of the UK
Other food products	42	62	40
Alcoholic beverages	68	99	17
Soft drinks and mineral waters	76	90	8
Tobacco products	100	100	3

Source: (Mahajan, 2006a) * The value of alcohol output is in terms of Gross Value Added (GVA), which is the monetary value of goods produced and traded in an economy.

In terms of the importance of the trade, the last column of Table 5.2 states that the top five firms in the alcohol industry as a group are ranked 17th in terms of value of their goods traded; whereas the top five firms of 'other food products' are ranked the 40th most valuable group of firms in the UK.

Text box 5-1: Competition Commission on producers and retailers

Historically, there have been changes in the market structure for alcohol. In 1989, the Competition Commission (then known as the Monopolies and Mergers Commission (MMC)) published a report suggesting they were worried the UK alcohol market, in the on-licence in particular, was moving towards a monopoly for several reasons including "the price of a pint of beer in a pub has risen too fast in the last few years; [and] the high price of lager is not justified by the cost of producing it" (Commission, 1989). This led to the breaking up of producers' pub ownership.

In the late 1990s and early 2000s, there was a succession of mergers that increased concentration in brewing (Slade, 2004). Structurally, the industry is more North American in style with greater advertising and more concentrated (Slade, 2004).

More recent market share data of 2004 suggests the alcohol industry is characterised as an oligopoly market (Mahajan, 2006b).

Regarding retailers, the UK's Office of Fair Trading (OFT) and Competition Commission (CC) has recently found that "in general, the UK market is competitive but that some of the pricing practices of the major retailers reflected market power and were found to be against the public interest" (Commission, 2007).

In terms of how the pricing policies may impact producers and retailers, market share plays an important role and literature suggests the higher the concentration, the greater the profit share. Specifically, "[t]he impact of market share on profitability was shown to be higher in more-concentrated industries and in sectors more protected from import competition" (Menezes-Filho, 2005). The implication is that if retailers have higher concentration, then they may benefit more in terms of profits (or have fewer negative losses) than producers. We elaborate on this further in the next chapter.

Importantly for the policy options under consideration, there are different implications of how producers and retailers respond to price controls depending on the market structures. With an oligopolistic structure, it takes a large change in price to have a small change in output. In order to keep output at a relatively stable level before and after the introduction of a pricing intervention, there are several tactics at the disposal of retailers and producers.

5.1.2 What is the reason for the alcohol market structure in the UK?

In large part, the reason some markets do not have more firms involved is because of economies of scale. Some industries have high fixed costs and only have enough total demand to sustain a relatively small number of firms.

The evidence on economies of large-scale operations in beer brewing was found in the US, where it was shown it was down to two factors (Scherer *et al.*, 1975):

- The need to create a national brand image (and associated costs).
- The need for coordinated investment (and associated costs).

These two factors have become increasingly important in the UK brewing market and evidence suggests the market in the UK has become more like that in North America (Slade, 2004).

Importantly, for pricing policy purposes, any increase in costs that the policy induces will be met with producers trying to recoup their economies of scale. This is likely to be one of the factors motivating producers' behaviour, and is further described in the following sections.

5.2 How may producers and retailers respond to pricing interventions?

With evidence suggesting that the alcohol industry is an oligopolistic market, we turn to the tools used by this type of market to (re)gain profits. Firms in industries with the concentration of that found for producers and retailers use two main strategies to mitigate the effects of price floors (or price ceilings), which are:

- non-price competition; and
- acquisition of other firms.

Non-price competition refers to strategies not related to adjusting prices to sell more products. There are three main activities, not related to price competition, which producers and retailers can use to recapture revenues. The first is advertising in which producers, and retailers, can use media outlets to communicate the value of their products; this can lead to more customers or current customers consuming more. The second element of non-price competition is product differentiation in which producers can try to separate their products through quality. At the extremes, minimum product differentiation is when similar product types (for example lager) are of the same quality; maximum product differentiation is when similar product types are of vastly different quality with some products of low quality and others of high quality and not much in between. Lastly, firms can try to increase barriers to entry. For example, given limited shelf space producers can institute contracts with retailers for certain amounts of alcohol that leave so little shelf space as to make it unprofitable for another producer to try and enter the market.

As to the acquisition of firms, producers and retailers may try to integrate vertically or horizontally, or merge with other businesses. Whereas before the pricing intervention there may have been a strategic interest to diversify their operations, it may be optimal to engage with other types of businesses. For example, producers may try to own more of their supply-chain, such as transportation or labelling firms.

These strategies – either separately or combined – may be employed either to avoid potential losses or to keep prices the same after the introduction of minimum pricing or a ban on sales below cost. Taxation, on the other hand, appears as a cost that producers and retailers either pass on to their customers or they do not. If they pass on the tax, they may keep profit margins the same; or pass on even higher prices and earn greater profit margins. If they do not pass on the tax and instead absorb it (that is, increase their costs), they either accept smaller profit margins or try to employ strategies that keep profit margins the same.

5.3 Role of major retailers in the alcohol industry

Thus far, we have considered the overall market structure and tools that actors in such a market structure may use to mitigate any perceived or actual negative effects of the proposed pricing policies. In this section, we develop a more in-depth discussion on the role of major retailers in the market for alcohol, especially in view of the recent movement towards increasing the trend in trade by volume of alcohol through this type of retailer. We first consider major retailers' relationship with consumers and then with producers, focusing on the bargaining power between these entities. We then present evidence discussing why major retailers are able to achieve lower prices than smaller retailers.

5.3.1 Consumers and the major retailers

There are two main categories of alcohol products sold by retailers:

- Brands developed by retailers. We refer to these products as 'own-brand'.
- Brands developed by alcohol producers. We refer to these products as 'major brands'.

Both retailers and producers provide a range of products in terms of quality and price. As consumers go to purchase the product they prefer, they are influenced by the context of their shopping situation.

There are two overarching contexts or types of consumer spending: primary and secondary. Primary shopping is the main shopping trip in which the substantial portion of the grocery needs for the week are purchased; secondary shopping is to complement or fill a gap in the 'basket of goods' and top up the basket (Commission, 2000). Primary shopping is approximately 80 percent of grocery expenditure (Smith, 2006).

Importantly, research suggests that the influence of price is different depending on whether the customer is on a primary shopping trip or secondary. For example, one UK study in 2008 found that when making a 'regular' wine purchase (as opposed to a special occasion) price was the most important consideration, followed by type of wine (for example sweet, dry), colour, grape variety and promotional activity, in a consumer's decision to pick a particular brand (Fearne, 2009). During a secondary shopping trip (for example for a

special occasion), respondents stated that grape variety and brand name were the most important characteristics.

While this information is for only one type of drink (wine), it is indicative of consumer behaviour that producers and retailers are likely to consider when developing their marketing strategies. That is, price is not always a key factor in a consumer's decision and when policies increase price, retailers may for example increase prices even further in order to signal differences in other attributes (such as brand recognition, ingredient quality, etc) that are sometimes more important to their consumers. We observe this with nearly all alcohol products in Table 4.8 in which major brands are priced higher than own-brands; this may be due, in part, to portray 'better brand name', ingredient quality, etc. In addition to signalling aspects of the product, major brands may also be higher priced due to higher costs, such as high-quality raw materials and greater marketing.

5.3.2 Bargaining power between producers and retailers

An important element of the relationship between the suppliers of alcohol and their buyers is the amount of bargaining power that one entity has compared with another. The reason is that when one side has more power than another, then the outcomes that benefit the side with more power are more likely.

For producers to have a bargaining advantage compared with retailers, they need to (Porter, 2008):

- be few producers with large market share (namely the five-firm concentration ratio is high)
- have few products and many retailers
- have unique or highly differentiated products with few or no substitutes
- be forward integrated; (that is, they have their own distribution); and/or
- have high switching costs for retailers (in other words, costs are incurred to purchase and sell alcohol of a different producer)[35].

Regarding the first point, we have discussed above that the production and retailing of alcohol are both relatively concentrated in the UK. This condition for producers' bargaining power over retailers, therefore, is present in the UK alcohol market.

On the second point, there are arguably many alcohol products available in the UK market. In addition, according to the UK's Office of Fair Trading (OFT) and Competition Commission (CC) the major UK supermarket retailers "reflected market power" (Hoj *et al.*, 2007) and hold a strong bargaining position.

On the third point regarding whether producers have highly differentiated products such that there are no substitutes, one can consider demand elasticities. When there are many substitutes available, consumers tend to be more price sensitive; as described in Chapter 2,

[35] An example of this is in the telecommunications industry. If a customer wants to switch from one mobile phone provider to another, there may be costs, including cancelling the plan of the original provider, purchasing a new mobile phone that works under the new provider, etc.

UK consumers of alcohol do respond to increases in price, for instance by changing to cheaper products.

Regarding the fourth point, producers of alcohol do not own off-licence premises, such as Tesco or convenience stores. As to producers' on-licence ownership, in 1989, the Competition Commission no longer allowed producers to own pubs (Commission, 1989). Although revoked in 2003, the ownership of pubs is still in the hands of large, independent owners. The internet has played an interesting role in this respect. Producers can sell directly to customers, thereby bypassing retailers and employing full forward integration, although there are some legal constraints to this. On the other hand, interviews with industry representatives conducted in the course of this study suggested that retailers have begun engaging in internet auctions to obtain the 'best' price from producers; they are described as open-bid, Dutch auctions, whereby all bidders know of others' offers and bid prices work downwards. This, it has been suggested in interviews, has reduced producer power, although a price floor may go some way in assisting producers in this respect.

On the fifth and final point, relating to switching costs, we do not have information regarding costs to switch from one producer of an alcohol product to another.

The evidence from the UK alcohol market, therefore, appears to indicate that the major retailers of alcohol have a relatively stronger bargaining position than producers of alcohol and therefore will be able to negotiate for prices and volume in their favour. This means, where profits are to be gained from the proposed policies, retailers have a stronger position to take hold of these profits. Some attempts have been made by producers to counteract this, namely through internet sales or pub ownership, although it is difficult to be certain the degree to which producers have managed to obtain bargaining power from retailers.

The evidence from the UK alcohol market, therefore, appears to indicate that the major retailers of alcohol have a relatively stronger bargaining position than producers of alcohol.

5.3.3 Lower prices for major retailers

There is a large literature examining the situation in which suppliers charge lower prices to larger downstream buyers than smaller ones (Tyagi, 2001). In the alcohol industry, this would refer to producers charging larger retailers lower prices than smaller retailers. The main reasons identified for why this happens are (Tyagi, 2001):

- competition among suppliers for larger buyers
- greater bargaining power of larger buyers
- greater economies of scale (for example larger buyers purchase more and permit the suppliers to produce at greater economies of scale)
- fewer collusive restrictions on output.

As to the last point, Tyagi (2001) finds evidence that suppliers may charge major retailers lower prices in order to pressure the retailers to sell more product (with the low price). If the producers had not charged such low prices, major retailers would have sold fewer products for a greater profit margin (that is, higher prices and fewer products sold). Tyagi

argues that the increased profit margins would not be passed on to suppliers, thus harming their revenues (for more on how this may occur, see Appendix A).

Our own interviews with alcohol industry representatives supported this view, stating that increased revenues may be possible for the price floor policies (not the taxation policy). If this led to increased profits, interviewees stated it would be difficult for producers to increase their prices to retailers because:

- major retailers would know producer costs have not have increased[36]
- with few major retailers and large volumes sold through the retailers, retailers know that producers will agree to not increase their prices.

5.4 Summary

The market structure for alcohol has changed in recent years such that the alcohol market in the UK resembles that of an oligopoly with large economies of scale and significant spending on advertising. This is due in part to a succession of mergers that increased market concentration. For this market, there is evidence suggesting that the major retailers of alcohol have a relatively stronger bargaining position than producers of alcohol.

This chapter also outlined the range of tools producers and retailers can use to respond to the introduction of pricing policies that set a price floor (or ceiling). While it is not possible to predict with any certainty how producers and retailers of alcohol in the UK would respond to these policies, it is reasonable to conclude that the strategies outlined here – either separately or combined – may be employed to either avoid potential losses or to keep prices the same after the introduction of minimum pricing or a ban on sales below cost.

[36] Note that this is a key reason why this discussion is different from taxation; with increased taxation, retailers know producers' costs have increased.

CHAPTER 6 Implementation costs of policy options

In the previous chapters, we have discussed the potential economic impacts for alcohol pricing policies in the UK. In this chapter, we consider the cost implications to government of implementing and monitoring each of the policy options. We then discuss the potential costs to on- and off-trade retailers and producers of implementing each policy option.

6.1 Direct cost to government

When governments change or institute new regulations, there can be costs to ensure compliance. This, in turn, generates costs and in this section we consider what these may be.

6.1.1 Minimum pricing

The key costs associated with minimum pricing would be to monitor whether on- and off-licence are adhering to the policy and to enforce the penalties associated with non-compliance. Although on-licence appear to have prices above proposed minimum prices as discussed thus far (specifically less than or equal to £0.50 per unit of alcohol), it may still be necessary to monitor their activities. For example, pubs and clubs have offered promotional discounts such as 'All drinks 50p', which would breach a minimum pricing policy (KPMG, 2008).

Importantly for reasons of cost, it may not be enough to go through a premise and confirm the price meets the policy requirements. This is because the contents of bottles or cans may need to be checked to confirm that strength and size conform to the new per unit of alcohol price policy. The HMRC confirms the necessity to do this as they state "[a]s with other methods of calculating alcoholic strength, confirmatory testing by an independent analyst or the Government Chemist should be done from time to time and the accuracy of gravity readings should be confirmed".[37] In terms of enforcement, the costs may be derived from having to determine the source of the breach of the policy; for example, it may occur that a product is mislabelled. As to the funding of this cost, it is unclear who would pay for this – government may seek to minimise their costs by requiring retailers to pay, for example.

[37] http://www.hmrc.gov.uk/manuals/beerpolmanual/beerpol12030.htm (as of 17 June 2010).

Although we have found no evidence to verify this, it is possible that in order to reduce these costs, government may wish to couple this monitoring and enforcement of the per unit minimum price with other activities. That is, alcohol is not an unregulated industry and it may be possible to identify on-going monitoring activities and add monitoring of per unit price. The government can use intelligence led and risk-based strategies to identify non-compliance with the policies. Another possibility is for competitors to report those not complying with the authorities. Economic literature generally indicates the opposite happens – once a firm fails to comply with a regulation and the police do not identify them, other firms are more likely to follow suit than to report competitors to police.

6.1.2 Ban on below cost sales

In 1999, the Competition Commission (CC) examined a number of pricing and competition issues for UK supermarkets. They considered two possible 'remedies' to below cost selling:

1. Permitting smaller retailers to purchase from the major parties of retailers any volume of goods at below cost for resale.
2. Prohibition of any sales below cost.

In an effort to quantify the extent and thus impact of below-cost sales in supermarkets, the CC collected costs estimations from supermarkets and examined the cases where there were negative gross margins that is, prices below the cost of purchase); the CC "ignore[d] operating costs associated with distribution, labour, space and display costs, wastage, etc, which will vary by product" (Commission, 2000:131). They provide two reasons for this: that most did not provide these costs and that, if the supermarket was pricing the product below what they purchased it for from the supplier, then they argue it is "unambiguously below average cost" anyway.

The CC argues that in order to identify instances of below-cost selling, government would need to make allowances for discounts, overriders (for example broker's commission), and similar payments that make below-cost selling profitable. That is, retailers may sell alcohol on promotions where it appears the product is selling at below cost; however, if one took into account that, for example, a producer provides a retailer with a promotion budget (because the retailer 'negotiated' a promotion budget from the producer) then the product is no longer selling below cost for the retailer. This is an example of 'similar payments' to which the CC refers. In fact, the CC suggests the retailer can earn a profit. It is this issue the CC suggests should be taken into account when identifying compliance with a below-cost selling ban.

In summary, it would appear that obtaining 'true' costs by producers and/or retailers is challenging and potentially costly in itself. Furthermore, the resources to monitor and intervene for government may be greater than the adverse effects of the below-cost sales (Commission, 2000).

6.1.3 Taxation

The HMRC records the cost of collecting alcohol duties and in 2008/09 it reported a decrease on the previous year from approximately 0.70 of a pence per pound sterling collected to approximately 0.60 of a pence per pound (or £0.006). This amounts to approximately £50.7 million in 2008/09.

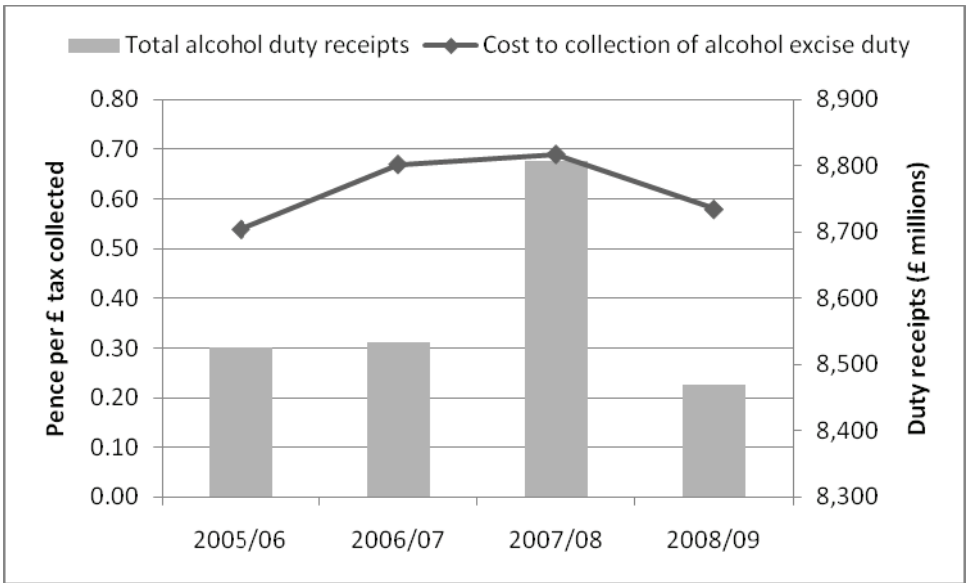

Figure 6-1: Amount of excise duties collection and the cost of the collection, 2005/06–2008/09

Source: HMRC (2010a)

The cost of obtaining taxation is, in part, due to the process in the UK for monitoring dutiable products. The UK uses a system of bonded warehouses and "this requires close supervision of the production process, including movement of goods up to the point where duty is paid, with the consequent costs of administration and loss of revenue to tax authorities" (Swann, 1992:81).[38]

As to whether the costs to government would increase in light of the proposed taxation policy, it depends on whether it becomes more beneficial to try and avoid taxation; in which case, it may become more expensive to try and collect the amount the government determines it is 'owed'.

6.2 Direct costs to producers and the on- and off-trade

Thus far we have considered costs to government to implement and monitor the compliance of the three pricing policies. In this section, we consider the costs to producers and the on- and off-trade to comply with the three policy options.

6.2.1 Minimum pricing

The direct cost of implementing a minimum price is mainly up to the seller who will need to alter display prices (either on shelves or on menus). The costs of altering display prices will be an immediate cost due to printing of new price labels or menus, and labour to switch current labels. On the other hand, display prices are generic and some printing costs will not be necessary. Equally, prices of alcohol often change anyway without the introduction of a legislative measure. So some costs, such as switching label costs, are not specific to the policy measure.

[38] Bonded warehouses are secured areas where alcohol (or other dutiable products) may undergo manufacturing operations or be stored without the need to pay duty.

Another, perhaps more difficult, indirect cost to disentangle is the cost of storage, especially if products are not allowed to go below a certain price and this prevents the moving of product off the shelf. This may result in 'congestion' in warehousing and storage (that is to say, more product is arriving but there is no place to put it). In the short run, this could have the effect of increasing storage costs. In the long run, however, retailers can redesign their supply-chain to take the new throughput schedule into account.

6.2.2 Ban on below-cost sales

The issue of a ban on below-cost sales and whether it is difficult to implement it comes down to the choice of what 'costs' mean. The concept of cost as 'VAT + duty' is easily communicable across businesses and does not require businesses to invest any money in order to identify the cost, so as to be able to adhere to the policy. The definition of cost as what is invoiced to retailers by producers is also easily communicable (although there are issues around whether this includes or excludes discounts, promotional budgets and so forth).

On the other hand, if the ban refers to actual costs to producers and/or on- and off-trade sellers per bottle or can, there will be costs incurred in identifying how much is the cost of each and every product. Generally, firms can spread fixed costs over all products; however, this would not be allowable if the true cost is what the policy asks of producers and retailers.

In particular, it may be relatively straightforward to identify the variable costs to a product because this will be the ingredients, for example, in which it is possible to identify what the bottle or can contains. Likewise, supermarkets and on- and off-trade premises will need to identify how much labour costs, for example, are attributable to each bottle or can. However, input prices change over time so the variable costs in one month will not necessarily be the variable costs in another month. This implies the ban on below-cost sales – if it were 'actual costs to producers or distributors'– would need to be flexible and change relatively frequently. Fixed costs may not be easily attributable to particular products. There are several reasons for this. First, some products may need to be stored at certain times of the year and not at others. Second, certain products may take more time to develop, and identifying the employment, storage, advertising, transportation and investment of each product type may be particularly challenging.

As to implementation costs, no matter what the definition, there may also be direct and indirect costs (as explained earlier for minimum pricing policy) in which retailers may experience short-run labelling costs, storage, and increased labour costs to switch labels. In the long run, the retailers can take the policy impacts into account and adjust their operations to reduce or eliminate these costs.

6.2.3 Taxation

Taxation is relatively straightforward and something with which firms are familiar. Simply increasing the rate does not incur any direct costs to producers because the way in which stamp duties are implemented on bottles, cans or cases does not require any adjustments. In particular, the rates are not stamped on the product.

Once again, for retailers, any change in price passed on to the consumer may result in direct and indirect costs (as explained earlier for minimum pricing policy and a ban on

sales below cost policy) in which retailers may experience short-run labelling costs, storage and increased labour costs to switch labels. Equally, it may be possible for retailers to utilise labels they already have and change labels when they would have done it anyway. In the long run, the retailers can take the policy impacts into account and adjust their operations to reduce or eliminate these costs.

6.3 Summary

The cost to government, producers and retailers of implementing these policies depends on what the policy proposes. In any event, there may be some (likely small) short-run costs to retailers from implementing all three policies. There appears to be very limited implementation costs to producers, except for a policy to ban sales below costs if costs are defined as actual costs to producers.

CHAPTER 7 Potential economic impacts of policy options

In this chapter, we provide indications of the potential changes in price, output, revenues, and consumer welfare. Because this study is not based on specific potential increases in excise duty, minimum prices, definition of costs for a ban on sales below cost, this chapter describes how much the proposed policies could alter prices, given a set of assumptions.

The figures provided in this section must necessarily be considered indicative and only preliminary estimates of potential, short-run changes in prices. That is, we do not consider the long-run changes in price that may be higher or lower depending on the responses of consumers, producers, suppliers, on- and off-trade retailers, foreign markets, etc. This, however, is an important avenue for further research as it would provide more information on the dynamics of the industry and the levels of final outcomes such as revenues, profits, employment levels, etc over a longer time period.

7.1 Minimum pricing

In this section, we consider how much a minimum price may alter current prices. We consider three possible minimum prices: £0.30, £0.40 and £0.50 per unit pricing. Lastly, we discuss how producers and retailers may respond to the pricing policy and thus the potential effects in terms of revenues and profits on producers and retailers.

7.1.1 Potential effect on final price

To understand the scale of the minimum pricing proposal, we compare overall retail prices across the UK and prices in a region (the North East) where prices, volume, and strength for a variety of brands were recently collected across some supermarkets and off-licences; we use the North East region for illustration as we know of no other region where prices per unit of alcohol are collected so thoroughly with a minimum per unit of ethanol price of £0.50. The immediate, short-run change would be as indicated in Table 7.1. The greatest changes are for table wine and cider in which prices may increase by approximately 35–40 percent. Beer and spirits may increase by approximately 5–10 percent.

Note that this does not consider the adjustments of the industry and thus long-run change in prices. Furthermore, the table suggests the introduction of a £0.50 minimum price would lead to a £1.07 reduction in the price of fortified wine. We do not suggest that fortified wine prices would actually fall; this table merely compares current per unit prices.

Table 7.1: Forecasted short-run increase in off-trade and supermarket average retail prices* across UK, if a £0.50 minimum pricing ban

Drink type	Average retail price (£)	New average retail price if minimum pricing (£)	Change in retail price (£)	Change in retail price (%)
Whisky (70cl bottle)	13.35	14.00	0.65	4.9
Vodka (70cl bottle)	11.53	12.25	0.72	6.2
Table wine (75cl bottle)	3.59	4.88	1.29	35.8
Fortified wine (70cl bottle)	5.62	4.55	-1.07	-19.0
Lager (4 x 440ml cans)	3.06	3.34	0.28	9.3
Cider (Litre bottle)	1.81	2.50	0.69	38.1

Source: Author's calculations based on HMRC (2010a). * 2009 average retail price.

In order to consider potential regional issues, we consider the possible short-run changes in price in the North East for own-brand and major brands across main and discount supermarkets. The average per unit price for beer is currently £0.33 (own-brand) and £0.49 (major brand). Introducing the minimum price of £0.40 would immediately reduce the difference between own- and major-brand of beer from £0.16 to £0.09. Neither literature nor interviews with industry representatives provide definitive evidence either way as to whether the smaller price difference is sustainable or the major brand price would increase further to maintain the £0.16 difference. Some interviewees suggested major brand prices would increase further, others suggested they would not and own-brand products may be packaged with other products (for example crisps, soda) in order to increase its attractiveness compared with major brand products.

The table below indicates that if there were a minimum pricing of £0.50 per unit of alcohol, the policy would effectively propose to increase per unit price of own-brands up to 163 percent and increase major brands up to 92 percent, depending on the alcohol type; cider products would be most affected. These increases may not be identical across the UK; compared with overall prices across the UK (as in Table 7.1), it appears the North East may experience larger increases in price with the introduction of a minimum price. Note that because wine sold in major supermarkets is already over the minimum per unit price of £0.50, the table suggests the introduction of a £0.50 minimum price would lead to a reduction in price. This does not suggest that wine prices would actually fall; rather this table merely compares current per unit prices to a £0.50 per unit price.

Table 7.2: Forecasted short-run percentage change in per unit price (%), North East off-licences and supermarkets, based on a £0.50 minimum pricing ban

	Own-brand		Major brand	
	Main supermarkets	Discount supermarkets*	Main supermarkets	Discount supermarkets
Beer	79%	35%	4%	2%
Wine	N/A	22%	-2%	19%
Spirit	72%	N/A	14%	35%
Cider	163%	N/A	28%	92%

Source: Authors' calculations based on assumption of £0.50 minimum pricing and (Balance, 2010) data.

Given the differential in own-brand and major brands prices, a £0.50 minimum pricing policy would directly push up prices of own-brand products. However, products are often sold by price points and it may be the case that major brands need to be differentiated at a higher price point, thereby pushing up prices of major brands as well (Levy *et al.*, 2007). This does not apply to taxation policy for example (since it would shift all prices) or the ban on below-cost sales policy since the price shift is likely to be more minor and would not bring the price of lower-priced alcohol to that of alcohol in another price point.

7.1.2 Potential final price impact on inflation

As an indication of the potential impact that changes in alcohol prices (from a minimum price) may have on overall price changes, we compare the potential price increase of a £0.50 minimum price with a previous price increase (due to the March 2010 increases in excise duty), which was estimated to have led to a 0.08 percentage point increase in the one-month change in the CPI. Table 7.3 shows there are larger price increases due to the minimum price and therefore a larger impact on inflation may occur.

Table 7.3: Comparison of 50p minimum pricing potential price increase and previous excise duty price increase

	Previous price increase due to excise duty (Mar 2010) (£)	Potential price increase of £0.50 minimum per unit price (£)
Pint of beer	0.02	0.00
Bottle of still wine	0.10	1.29
Bottle of spirits	0.36	0.69
Cider	0.05	0.69

This does not take into account, however, the potential reduction in consumption. That is, if people reduce expenditure on alcohol because of the price increase, inflation will not actually increase as much as indicated. The contents of the basket and the weights assigned to the items in the basket are updated annually to reflect changes in spending patterns; thus once decided on at the beginning of the year, they remain fixed throughout the year.

7.1.3 Impact on producers and retailers

As discussed in Chapter 3, generally speaking, governments use price floors to increase competition or increase the quality of service (Bhaskar, 1997). The original reason, for example, for the Grocery Order in the Republic of Ireland was to introduce price competition in which the Fair Trade Commission (FTC) of 1955 concluded that "the extent of price competition in the grocery trade should be stimulated to the benefit of the consumer" (Collins, 2009).

Governments can also introduce price floors with the intent to address the externalities accrued from consumption of a particular product, such as these proposed alcohol pricing policies. Another example in the UK is the reform of the Climate Change Levy, under consideration, in which the Conservative government intends to introduce a price floor on

the price of carbon to increase competition and reduce harms from pollution (by incentivising firms to engage in activities to reduce carbon emissions).[39]

The argument that a price floor will increase competition or quality of service is weakened when some competitors are not subject to the regulation. For example, the sales of alcohol from outside the UK through the internet and in countries close to the UK (for example France, Republic of Ireland) may reduce the intended effect of the introduction of a price floor in this country.

From an economic perspective, price floors restrain firms from limiting the ability for new firms to enter the industry and compete. Since most firms need to start small and grow, industries with large economies of scale are difficult to enter. The government may decide that these factors lead to unfair competition in an industry and wish to introduce a price floor to increase competition. On the other hand, firms that invested in the economies of scale may potentially lose out as prices shift and more competitors enter the market.

The issue here is the difference between products being sold below the price floor and those above. Generally speaking, more value brand products are likely to be sold below a price floor than major brands. Therefore, the introduction of a price floor requires major brands to compete with value (or own-) brands or increase their price. If the decision is to compete with value brands at the minimum price, the value brands may start to lose shelf space because retailers may focus on branded products that sell better than value products at the same price.

There may be instances where an increase in price leads to small reductions in the supply of alcohol because there are fewer people willing and able to purchase at the higher prices. Depending on the price, this may lead to greater profits; the increase in price is more than the reduction in output. The question then becomes, who would benefit from the increase in profits; would producers be able to increase their prices to retailers or would retailers demand the same price from producers and keep the increased profits? The bargaining power of major retailers may result in any increases in profits not flowing back to producers.

It is worth now considering costs associated with the pricing policies to examine how the relationship between retailers and producers may unfold. Let us suppose the price increase leads to producers reducing the amount of alcohol they produce; an immediate, direct effect will be that producers have higher average costs. That is, the fixed costs will be spread over fewer products so the average cost across their products increases. It is possible that the higher average costs are met with higher revenues, so producers maintain profits. If, however, producers cannot receive benefits from the higher prices (because retailers use their bargaining power to keep the difference between pre-intervention and post-intervention prices), producers will have lower profits. Producers will want to adjust their processes and operations to increase profits again.

In order to recoup profits, firms need to reduce marginal costs.[40] There are three overarching inputs into producing alcohol – land, labour and capital – and thus three

[39] http://www.conservatives.com/~/media/Files/Green%20Papers/Rebuilding-Security.ashx?dl=true (as of 17 June 2010).

possibilities to reduce the average costs of operating in the alcohol market. The producers can:

- reduce the number of hours that employees work or reduce wages
- reduce capital payments (for example remortgage, reduce research and development (R&D) spending, reduce marketing and advertising budgets, etc)
- adjust the use of land (for example shift agriculture production for alcohol to produce other products).

Evidence from the literature demonstrates that if the price floor is binding (that is, the chosen minimum price is high such that products retail exactly on the minimum price) and this causes minimum product differentiation (namely all products are of the same quality), there will be socially inefficient investment into higher quality (Bilotkach, 2009). This implies that if the final prices following the introduction of a minimum price are greater than the pricing set by a below-cost sales ban, and the minimum price is binding such that retailers set products at the minimum price, the policy for minimum pricing will be more socially inefficient.

7.2 Ban on below cost sales

In this section, we consider what a ban on below-cost sales may mean for final prices to consumers. We use the definition of cost as VAT + duty to compare against retail prices and then we discuss when the ban may be relevant, or when below-cost sales strategy is employed. Lastly, we discuss how producers and retailers may respond to this pricing policy and thus the potential effects in terms of revenues and profits on producers and retailers.

7.2.1 Potential effect on final prices

As explained in the Introduction, we were not given any guidance regarding the actual definition of 'cost' and for the purposes of illustration we consider the definition of cost as 'VAT + duty'.

The extent to which a ban on below-cost sales may change retail prices would more accurately be identified with data on the range of prices for different brands of alcohol (for example own-brand, major brand), at different points in time throughout the year, and in the various premises (such as clubs, bars, discount supermarkets, etc). However, we are unable to locate this type of information; the available and reliable information on recent prices are the retail and consumer price indices (RPI and CPI) and a Balance (2010) report collecting prices in the North East. The limitations of this data are the frequency (that is, RPI and CPI are available monthly; Balance (2009) report was performed once) and information on location (namely RPI and CPI are only available nationally; Balance (2010) report is available for one region, although premises are quite detailed).

Therefore, none of these data are fully comprehensive. In order to provide the reader, however, with some indication of what the ban on below-cost sales may mean for changing

[40] The cost for producing one additional unit.

prices, we consider the average annual and monthly prices in the CPI. This at least provides an indication of overall prices across the regions compared with VAT + duty. As shown in Table 7.4, overall retail prices are approximately 55 to 270 percent above VAT + duty, depending on the type of drink.

Table 7.4: Retail prices compared with VAT + duty, 2009

Alcohol product	Retail price (£)	VAT + duty (£)	Difference between retail price and VAT + duty (£)	Percentage difference between retail price and VAT + duty (£)
On-trade				
Pint of bitter	2.32	0.66	1.66	248.9%
Pint of lager	2.67	0.73	1.94	266.2%
Off-trade (incl. supermarkets)				
Lager (4 x 400ml cans)	3.06	1.60	1.46	91.8%
Table wine (75cl Bottle)	3.59	2.08	1.51	72.7%
Fortified wine (70cl Bottle)	5.62	2.73	2.89	105.8%
Cider *(Litre Bottle)	1.81	0.53	1.28	241.0%
Whisky (70cl Bottle)	13.35	8.08	5.27	65.3%
Vodka (70cl Bottle)	11.53	7.44	4.09	55.1%

Source: Author's calculations based on HMRC (2010a). * For 2008

Of course, as described earlier, these are average retail prices; therefore, prices can still be below VAT + duty throughout the days and months. To see this, the average retail prices are provided monthly and Figure 7-1 shows the average price index in each month over the period 1996–2008, using alcohol prices collected for the CPI, which includes both off- and on-trade prices. A price index is used to show how prices change relative to a certain point in time; here, January 2006 is the index. The figure shows that, overall, alcohol prices are lower in November through to January and slightly lower in July. Therefore, as we increase the frequency with which we examine prices (annual to monthly), we begin to see the variation in retail prices over the year and observe there is scope for considering below-cost sales strategies to be used on a more daily or monthly basis. That is, an annual retail price and monthly retail price are unlikely to capture the use of below-cost sales. It is necessary to have more daily pricing evidence.

A step forward in building evidence in this area would be to designate a short timeframe, such as one week randomly in the year, to collect prices at various times of the day across several randomly selected premises (including clubs, bars, restaurants, major retailers). This would provide a more accurate picture of the extent to which sales below VAT + duty are used.

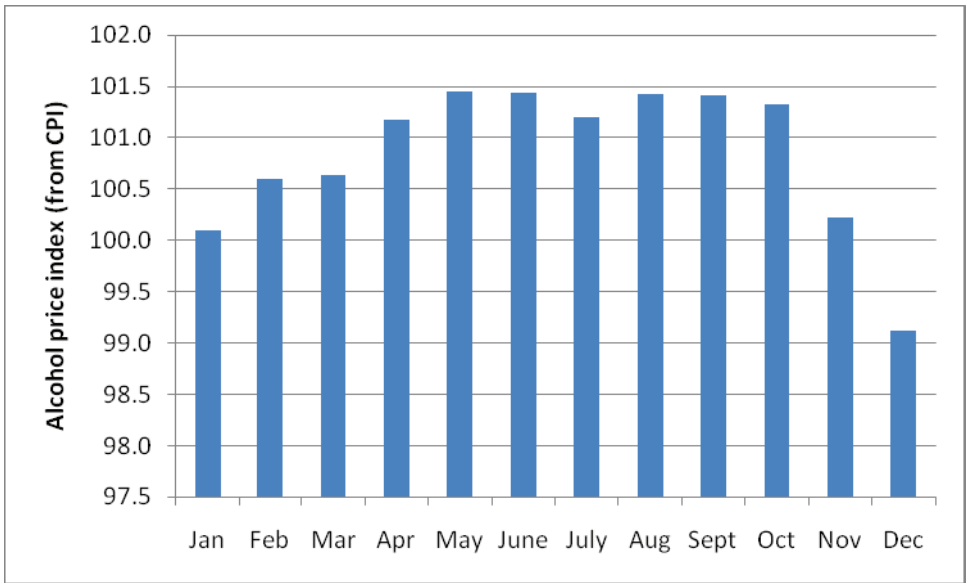

Figure 7-1: Average monthly alcohol price index, 1996-2008

Source: Office for National Statistics Consumer Price Index on alcohol data.

Note: Index Jan 2006 =100.

So far, we have discussed off-licence premises, exclusively supermarkets, and presented statistics on the retail price of alcohol in both off-licence and on-licence. We did not locate evidence regarding how off-licence premises or on-trade retailers sell below cost or use 'loss leader' strategies.

There is literature in this area, however, which discusses how retailers may use below-cost sales as a 'loss leader' strategy. This is important because it is one of the reasons for using below-cost sales and if we understand better why it is used, we can begin to understand what may occur if there is a ban on selling below cost.

It is well recognised that prices in supermarkets for seasonal food products fall at demand peaks. That is, for food products with a seasonal element (for example turkey at Christmas) even when the demand is high, prices actually fall. Alcohol, for example, has seasons in the US and UK such as Christmas and New Year and in the hotter summer months in which there are drops in the price of alcohol (see Table 7.2 below for the UK).

According to the economics literature, there are, in effect, three key possible reasons why this happens:

1. Economies of scale in price search (Warner and Barsky, 1995).
2. Cyclical changes in firm conduct (Rotemberg and Saloner, 1986).
3. Loss leader competition (Lal and Matutes, 1994).

In the first, prices fall during peak demand periods because customers are gaining more price information across outlets and will be more price responsive than normal. That is, the 'cost' of finding the best price is lower than usual because customers are out shopping more than normal and observe prices in many locations. Retailers consider this activity and believe that when there are peaks in demand, such as Christmas, customers will be more

price responsive. As such, retailers believe they have to reduce prices or lose out to competitors.

In the second, the cycles of high and low demand result in prices falling during high demand peaks. The way in which this can occur is that during temporary high demand periods, such as Christmas or football matches, all retailers seek to keep up prices in order to earn higher revenues. However, a retailer knows that if it reduces its price slightly it can take business away from its competitors and earn even higher revenues. The retailer also knows that if it does reduce prices now (and no other retailers do), the other retailers will 'punish' it by reducing prices in the future. The trouble is, in the future demand will fall again. This will result in the retailer earning less revenue in the future (due to low prices and low demand). On the other hand, the value of earning more revenue now is worth more than the reduced revenue in the future, so there is a significant incentive to reduce prices. Of course, this strategising is common to every retailer and none of them wants its competitors to take advantage of the opportunity to earn higher revenues during the peak demand. Therefore, all the retailers reduce prices during peak demand. As Chevalier *et al.*, (2003a:17) put it, "the temptation to cheat from a collusive arrangement is highest during a temporary demand spike, because the gain from cheating is increasing in current demand, while the loss from punishment increases in future demand."

The third point refers to the fact that there is imperfect information about prices in a retail outlet. A high demand period is an opportunity to bring in customers to purchase the good for which they have high demand, and more importantly, to purchase other goods in the store. As a strategy to bring in customers, retailers drop prices for which customers have peak demand and they use advertising to communicate the low prices. In this argument, it is not enough to suggest prices are simply low, as there are many reasons for dropping prices generally (for example need to make room in storage, expired product, etc); what is of particular interest is the 'loss leader' strategy in which prices fall to encourage customers to buy other products and that the prices are falling *during peak demand*.

Evidence for this third explanation is further developed in Chevalier *et al.* (2003a) where the authors use exogenous changes in demand – hot weather and specific US holidays (Memorial Day, Independence Day, Labor Day and Christmas) – that accentuates demand for beer with no discernable increases in total demand for all the products in the supermarket. The authors are particularly interested in retailers' profit margins across a number of products. With information on retail margins and wholesale prices, Chevalier *et al.* (2003a) are able to apportion the price response during the demand peaks between retailer and manufacturer behaviour; they find strong statistical significance that the lower margins to retailers are due to their increased advertising, rather than increasing prices from manufacturers on the retailers.

The economics literature originally argued that the first two points (on economies of scale in the price search and business cycles) do not necessarily compete with each other and could both occur, with empirical evidence in the US suggested this was the case. More recently, there is empirical evidence in the US that suggests the third point on information asymmetry and advertising is more likely the case.

Importantly for the policy proposed, the key implication is that when below-cost sales occur during periods of high demand, banning below-cost sales may not affect consumption as much as would be expected; not just because prices may only change slightly, but because it is a strategy used during high demand periods. By definition, people are likely to continue purchasing during this period.

It is unclear which of the three reasons outlined above explain why sales below cost occur during high demand periods in the UK.[41] As shown earlier in this chapter, we can examine monthly price data to observe whether falls in price occur during likely peak demands (for example during Christmas, New Year and summer months). Looking at UK average prices monthly, the ONS data suggests prices fall in December. This is supported in a report by Balance, which found that "[i]n mid-November, all the supermarkets were gearing up for the festive period, with Morrison's locating its alcohol aisles alongside its 'Christmas Market' and Tesco promoting traditional 'Christmas' drinks such as a litre of Irish Cream for £8" (Balance, 2010:4). Therefore, one of the strategies for selling at below cost may lie in the three key reasons proposed; all of which have the implication that if prices increase to comply with the regulation, people are likely to continue purchasing alcohol at similar levels because it is a peak demand period.

7.2.2 Potential final price impact on inflation

As we do not have evidence regarding the prevalence of below-cost selling of alcohol, we are unable to calculate the price increase per bottle or can associated with a ban on below-cost sales. Given data on retail prices generally and compared with VAT + duty, it would appear that a ban on below-cost sales would alter prices less than a £0.50 minimum pricing. Assuming this is the case, the impact on inflation would be less than that of the minimum pricing.

7.2.3 Potential impacts on producers and retailers

In terms of the final price to the consumer, a ban on below-cost sales is likely to slightly increase final price because as we demonstrated, there may be daily troughs in price when on- and off-trade price below cost.

Producers may find it difficult to increase prices to major retailers. This is because retailers are likely to have more bargaining power than producers and with no change in actual costs to the producers, the retailers may demand that producers cannot justify increasing their prices. This would result in increased revenues (and potentially profits) to major retailers. As to producers and on-trade and other off-trade, we have little to no information on their market concentration; if it is less than major retailers, then producers will have more opportunity to increase prices. Depending on consumer response, this could increase producer revenues.

7.3 Taxation

In this section, we consider what taxation may mean for final prices to consumers by using literature and data on pass-through; again, we use this strategy because in this study no

[41] In addition to those three reasons, it is also possible that firms are competing on volume of sales (location and sales), not just price.

specific increases in tax rates are considered. We then examine how producers and retailers may respond to increased taxation and thus the potential effects in terms of revenues and profits on producers and retailers.

7.3.1 Potential effect on final prices

In order to discuss how a change in the tax rate may affect prices, we first consider what influences excise duty rates. According to the HMRC, "[t]he rate of excise duty payable on alcohol products like spirits, wines and beers is based on their alcohol content and volume. In the case of wine and cider the rate also depends on whether they're still or sparkling."[42] Therefore, any increase in excise tax rate will be greater for those drinks of a greater volume or strength.

Next we consider the current tax rates. As of 29 March 2010, the duty rates for all still ciders, and sparkling cider exceeding 1.2 percent alcohol by volume (abv) but not exceeding 5.5 percent abv, increased by 10 percent above inflation. Duty rates for all other alcoholic drinks increased by 2 percent above inflation. The Small Breweries' Relief scheme continues to provide 50 percent duty relief to the smallest brewers (HMRC, 2010b). For visual representation of changes in VAT, excise duties and retail prices over time and across alcohol products in the UK, see figures in Appendix B.

In terms of actual prices, the following table provides the pounds sterling rate at which different alcohol types are now taxed. Note that some of the figures appear to be relatively high (for example sparkling cider and perry: 5.5%–8.5% abv); as discussed earlier, the ABV levels and still or sparkling nature of wine and cider influences the duty rate. Particular combinations incur relatively higher duties than others.

Table 7.5: Alcohol duty rates, as of 29 March 2010

Type of drink	Rate (£)
	Rate £ per litre of pure alcohol
Spirits	23.8
Spirits-based Ready To Drinks	23.8
Wine and made-wine: **Exceeding 22% abv**	23.8
	Rate £ per hectolitre percent of alcohol in the beer
Beer	17.32
	Rate £ per hectolitre of product
Still cider and perry: **Exceeding 1.2% – not exceeding 7.5% abv.**	36.01
Still cider and perry: **Exceeding 7.5% – less than 8.5% abv.**	54.04
Sparkling cider and perry: **Exceeding 1.2% – not exceeding 5.5% abv.**	36.01
Sparkling cider and perry: **Exceeding 5.5% – less than 8.5% abv.**	217.83
Wine and made-wine: **Exceeding 1.2% – not exceeding 4% abv.**	69.32
Wine and made-wine: **Exceeding 4% – not exceeding 5.5% abv.**	95.33
Still wine and made-wine: **Exceeding 5.5% – not exceeding 15% abv.**	225.00

[42] http://www.hmrc.gov.uk/customs/tax-and-duty.htm#2 (as of 17 June 2010).

Type of drink	Rate (£)
Wine and made-wine: **Exceeding 15% – not exceeding 22% abv.**	299.97
Sparkling wine and made-wine: **Exceeding 5.5% – less than 8.5% abv.**	217.83
Sparkling wine and made-wine: **8.5% and above – not exceeding 15% abv.**	288.2

Source:(HMRC, 2010b)

When the aim of taxation is to affect consumer behaviour through changes in price, the key question is whether or not the tax increase is passed on to the customer, or whether the producers and/or retailers absorb this 'cost'. One way to consider whether there is pass-through is to examine changes in excise duty rates over time and to see whether there were changes in retail prices (see Appendix B for full statistics on retail prices and taxation).

A report by the British Beer & Pub Association provides pass-through elasticity estimates by three different organisations – the HMRC, Oxford Economics and PriceWaterhouseCoopers (PwC) – for on- and off-licenced purchases of beer (Association, 2010). A positive figure indicates greater than full pass-through (over-shifting); that is, in addition to the duty increase, the pre-tax price also rises (by x percent) following a 1 percent increase in duty. A negative figure indicates less than full pass-through. The estimates presented in the report suggest the on-trade increases prices beyond the tax increase, while off-trade tend to absorb some of the tax increases.

Table 7.6: Pass-through elasticities for on- and off-trade beer

	Haung (HMRC)	Oxford Economics	PwC
On-trade pass-through	0.0 (assumed)	0.5	0.42
Off-trade pass-through	0.0 (assumed)	-0.3	-0.3

Source: (Association, 2010)

In order to understand more fully the implications of excise duty increases across a variety of products, we estimate[43] the typical association between excise duty and retail prices across products reported by the HMRC (for visual representation of the association between excise duties and retail prices, see figures in Appendix B). In the UK, pass-through appears to depend on the alcohol product and the location (for example on- or off-trade). As demonstrated in Table 7.7 below, all the on-trade products (with available price and duty data from the HMRC) are associated with greater increases in retail prices than the increase in tax (over-shifting). Specifically, a 1 percent increase in real excise duties on a pint of bitter or lager is associated with an approximately 1.3 percent increase in the real retail price.

In the retail outlets (for example supermarkets), four of the six products do not fully pass-through excise duty increases, which may be why a previous report (Association, 2010) on pass-through suggests less than full pass-through. However, this masks some differences across products; for example, there is full pass-through with cider and more than full pass-through with whisky.

[43] We perform a simple Ordinary Least Squares regression for the log of real retail prices on the log of real excise duties, separately for each alcohol type. For further explanation of the method and full regression results, see Appendix B.

Table 7.7: Typical percentage change in real retail prices for a 1% increase in real excise duties

Alcohol product	Percentage change in real retail prices
On-trade	
Pint of bitter	1.33%
Pint of lager	1.31%
Off-trade (incl. supermarkets)	
Lager (4 x 400ml cans)	0.84%
Table wine (75cl bottle)	0.86%
Fortified wine (70cl bottle)	0.68%
Cider (Litre bottle)	1.00%
Whisky (70cl bottle)	1.21%
Vodka (70cl bottle)	0.95%

Source: Author's calculations based on HMRC (2010a).

Note: To generate real excise duty and real retail prices, we use the RPI to adjust for inflation.

However, this does not take into account changes in VAT. Importantly, it may be that some of the pass-through of duty may be due to the influence of changes in value added tax (VAT), rather than simply duty. That is, those selling alcohol may consider the total tax cost and adjust price accordingly. Thus, if there is no change in the total tax cost (that is, VAT falls by an amount that equates to an excise duty rate increase), there may be seemingly no pass-through of an increase in duty.

7.3.2 Potential final price impact on inflation

As this study does not analyse specific excise duty rate increases, we turn to the ONS's estimate of the March 2010 increase in excise duty on alcohol (as described in Table 7.5). These changes are estimated to have a 0.08 percentage points increase on total inflation. Again these estimates do not take into account pass-through, nor changes in consumption. An avenue of further research would be to conduct more in-depth analysis of the weight adjustment (from changes in consumption) and pass-through to provide a more accurate assessment of the relationship between changes in excise duty and inflation.

7.3.3 Potential impacts on retailers and producers

In terms of the final price to the consumer, an increase in taxation may be passed through for some products. Where producers find it difficult to increase prices to the on- and off-trade (including supermarkets), producers may need to absorb some of the tax increase. Only those producers with enough profits and/or ability to switch into producing other products will continue.

In the event that on- and off-trade (including supermarkets) and producers pass-through higher tax rates, they may reduce output (at least in the UK) in order to maintain profit margins. Another potential strategy is to try to use the tools described earlier (for example advertising, mergers, etc) to increase or maintain output with higher excise duties. Lastly,

they may try to maintain current prices, thereby not passing on higher tax rates to the consumer; however, we show that this strategy would be product and location specific.

7.4 Potential impacts on consumer welfare

The key to understanding the impact of a pricing intervention on consumers is the impact it has on their welfare, or 'utility' (see Appendix B for more description on how this is done). Essentially, the ways in which this is measured provides the income effect associated with a change in the price of alcohol relative to other goods and answers the question:

How much of a change in income is necessary to offset a change in alcohol price so that a consumer's utility remains at a given level?

That is, consumers purchase goods, including alcohol, because they receive benefits from it. By increasing the price, consumers cannot purchase the same amount of total goods as they could before the alcohol price increase. Following an increase in the price of alcohol, consumers will alter their consumption 'basket'; exactly what composes the consumption basket depends on their sensitivity to price. For example, some individuals may not change the amount of alcohol they purchase, instead reducing the amount or types of food in their basket. On the other hand, some consumers may reduce the amount of alcohol they purchase, such that they are able to continue purchasing the same amount of other goods as before the alcohol price increase. For these people, the amount of income they would need to receive to offset their loss in satisfaction from having to consume less alcohol is positive; indicating a loss in welfare due to the alcohol pricing policy. Yet others may substitute for cheaper alcoholic beverages, so that the quantities of both alcohol and food consumed remain the same, but the 'quality' of the alcohol (as signalled by the lower price) is lower, which is a reduction in welfare. Finally, people may substitute into other goods in order to maintain their satisfaction. As discussed in Chapter 3, an important debate in public policy is whether individuals substitute alcohol for other substances like tobacco or cannabis when the price of alcohol increases (this is not clear for the UK). For more on these issues, see Appendix A.

However, there are two key assumptions, on which the discussion in the previous paragraph is based, which evidence indicates are violated:

- That all consumers are rational and fully informed.
- That no externalities are accrued from consumption of the good in question.

Regarding the first violation, the economic theory that assumes an increase in price will lead to a decrease in consumer utility does not account for the fact that hazardous and harmful drinkers (who consume a large proportion of all alcohol) may not be making fully informed and rational decisions about their alcohol consumption habits, especially but not exclusively when they are drinking (Collins and Lapsley, 2002; Kleiman, 2008; Sutherland, 2007; George *et al.*, 2005). Given this, an increase in price and subsequent reduction in consumption may actually increase consumer welfare by reducing the incidence of alcohol-related harms among this group of drinkers (reduced violence, motor vehicle accidents, etc).

The second violation refers, as discussed in previous sections in this report, to the fact that many of the externalities from alcohol consumption accrue to non-hazardous and harmful drinkers. It is therefore possible for policies that increase alcohol prices to raise overall welfare if a reduction in the externalities from alcohol consumption exceeds the reduction in welfare from decreased alcohol consumption. For a more formal indication of how externalities and welfare effects interact, see Appendix A.

7.4.1 Price floors and welfare

There are cases in which price floors can have positive or negative welfare effects. If all alcoholic beverages sit on the chosen price floor and this forces all alcohol types to become of the same quality, firms will invest to try and demonstrate they have higher quality products; the problem is that consumers are not willing and/or able to pay for higher quality and would rather have something else (such as lower price products), so this investment is not socially efficient (Bilotkach, 2009).

The conditions in which the price floor can increase consumer welfare is that if the alcohol industry is characterised as a low-cost (dominant) and higher cost (subordinate) oligopoly, then introducing a price floor can increase consumer welfare by bringing in prices and quantity line with equilibrium (Banerjee, 2007).

7.5 Summary

Through interviews and a review of literature and data, we find that given the differential in own-brand and major brands prices, an assumed £0.50 minimum pricing policy would directly push up prices of own-brand products. However, because products are often sold by price points, it may be the case that major brands need to be differentiated at a higher price point, thereby pushing up prices of major brands as well. The same is not true for tax increases since they would, in theory, shift all prices. With a ban on below-cost sales policy the price shift is likely to be more minor than with a minimum price and is unlikely to bring the price of lower-priced alcohol to that of alcohol in another price point.

Producers and retailers would likely try to use tools, such as advertising and merging with other firms, to mitigate the impact of the introduction of price floors, especially through a minimum price. Where prices must necessarily increase and if this generates more profits for retailers (that is, because consumption does not fall relatively as much as the increase in price), producers would find it difficult to capture any of these profits due to the nature of the market as an oligopoly and the stronger bargaining power of retailers.

The impact of the three measures on consumer welfare is an issue that raises controversy in debates about alcohol pricing policy. On the one hand, there is concern that increases in price reduce consumer welfare as consumers have to pay higher prices or modify their consumption (for instance by switching to cheaper products) following price increases. On the other hand, we know that, unlike ordinary commodities, alcohol consumption has important externalities which, if reduced through increases in pricing, result in increases in consumer welfare. The question remains, however, whether the increases in consumer welfare flowing from the pricing policies offset the decreases. While extensive research shows that increasing alcohol prices can result in important gains in societal and individual

level outcomes (in health, crime and so forth) research on individual consumers' benefits from alcohol consumption is still extremely limited.

CHAPTER 8 Conclusion and discussion

8.1 Summary of key issues for each policy option

This study examines the theoretical and empirical literature about the economic impacts associated with three alcohol pricing policies – minimum pricing, below-cost sales ban and increased taxation. This study also builds an understanding for how the UK alcohol market may react to such policies and what the challenges may be of implementing such policies.

This study identifies a number of economic issues to consider for each of the policy options under consideration by the Home Office. These are summarised below.

Economic implications of increases in alcohol excise duty rates

The literature and data reviewed in this study indicate that taxes are passed through to consumers to varying degrees. For the most part, the on-trade appears to pass tax increases on to consumers at least at the level of the tax increase, whereas the off-trade (in particular larger retailers such as supermarkets) appears to be more able to absorb these increases, leading to little or no change in the price faced by consumers. Nevertheless, evidence suggests excise duties do not seem to lead to considerable declines in sales revenue or competitiveness.

When they are passed on, taxes affect all drinkers, who either pay more to consume the same amount, reduce the amount they drink, or substitute for cheaper beverages or other products. This is why taxation has been considered a 'blunt instrument' that does not target those drinkers who cause harms, instead affecting all consumers to some extent.

An important aspect of taxation is that, unlike with the two other pricing policies examined here, the Government obtains additional revenues from tax increases. The extent of this additional revenue, of course, depends on the level of the tax increase and the price elasticity of demand.

Economic implications of minimum pricing

Unlike taxation, minimum pricing circumvents retailers' ability to absorb price increases, so all alcohol currently sold below the minimum price per unit would become more expensive with the introduction of this policy. Because the price effect of this policy is especially strong for low-cost alcohol, minimum pricing has important implications for young and hazardous/harmful drinkers and low-income groups, who are more likely to purchase cheaper drinks.

Due to the already higher prices charged, minimum pricing is likely to affect prices in the on-licence trade less than other retailers. In fact, on-licence may benefit from increased

trade as the relative prices of on- to off-licence premises are reduced, and some consumption switches from the off- to the on-trade. Nevertheless, minimum pricing could have a positive impact on other retailers' revenues as well. The direct costs to producers and retailers of implementing this regulation are likely to be relatively small.

Lastly, government generates no revenue from a minimum price policy.

Economic implications of a ban on sales below cost

The size of the impact of a ban on sales below cost depends on the extent to which retailers engage in this pricing strategy. There is evidence that sales below cost are particularly common in the UK in the supermarket sector, and specifically during times of high demand (such as Christmas and the hotter month of July). The effect on consumption of a ban on sales below cost, therefore, may be relatively small compared with broader restrictions on discounts and promotions, and to the introduction of certain minimum prices or tax hikes. Nevertheless, even if the effect is small, where it increases the price of the cheapest drinks, the ban could potentially lead to some reduction in hazardous/harmful drinking.

An important issue regarding sales below cost bans is the definition of cost adopted for this policy. If cost is defined as VAT + excise duty, the implementation and compliance costs of the policy are relatively small as VAT + excise duty are a transparent and easily identifiable cost. Other definition of costs (such as the true cost of production of the product) would make this policy much more difficult to implement due to the fact that many of these costs vary significantly across products, producers and even times of the year.

As in the case of minimum pricing, the ban would not generate revenue for government.

Other economic implications of alcohol pricing policies

Faced with any of these pricing policies, producers and supermarkets (and to some degree potentially the on-trade) may use non-price competition (for example advertising, rebranding or acquisition of firms in their supply-chains) as a strategy to mitigate the effect of price changes.

There is some international evidence on fiscally-induced cross-border shopping, which finds that significant tax and price differentials can induce some consumers (primarily those close to the border) to engage in cross-border consumption. The extent to which this shift to cross-border consumption occurs, however, depends on a range of factors including the magnitude of the tax/price difference, exchange rate fluctuations, the cost and ease of cross-border travel, and people's preferences (when the proportion of consumer expenditure devoted to buying alcohol is high, then consumers may see alcohol as an important good compared with other goods and an increase in the true price may provide an incentive to consumers to purchase across a foreign border). We have not identified research that models the magnitude of the potential shift to cross-border shopping, or other types of unrecorded consumption, should a pricing policy be introduced in the UK. Research from the UK, however, suggests that alcohol taxes are not at their revenue maximising level. While some evidence suggests that following a pricing policy, people may buy more alcohol from abroad even if the overall cost including transport negates any savings. The balance of evidence seems to suggest that increases in unrecorded consumption rarely cancel out decreases in recorded consumption.

8.2 Concluding remarks

This study presents the first attempt systematically to assess the possible economic implications of three specific pricing policies, which are currently being considered by the UK government. The study is limited in scale, however, and therefore provides only an indication of the way in which the alcohol market in the UK may react to these policies. In particular, the study could not produce actual quantitative estimates of the effects of the policies on the different actors in the market for two main reasons. First, we were not working on the basis of specific policy prescriptions (such as a minimum price of 50p, an increase in taxation of 10% across all drinks, or a ban on sales below cost where cost is defined as VAT + excise duty). Second, for a number of economic impacts of interest, the data available are simply not sufficient to arrive at definitive conclusions with much certainty. For instance, the impact of a ban on sales below cost is impossible to estimate accurately in the absence of good data on the extent to which this practice is used by retailers. In view of these limitations, this study cannot answer policy questions regarding, for example, the optimal level of alcohol taxation or whether alcohol sales below cost should be banned, or whether one policy may be more desirable or suitable than the others.

Nevertheless, the study provides clear indications of the likely *direction* of the effects of these policies, if not their actual magnitude. Ultimately, from a social welfare perspective, this study allows us to go a little bit further in discussions of whether these measures would have an *overall* positive or negative effect by zeroing in on some of the most under-researched issues around alcohol pricing policies. A true analysis of overall, societal-level costs and benefits of the specific policy options needs to consider these in order to capture fully the distribution and types of impacts across the key actors involved: consumers, producers, retailers and government. Further research, of course, is warranted to inform policy decisions in this area.

8.3 Gaps in the literature and future research

The objective of this study is to provide a review of the evidence, describe the market quantitatively, and to provide some insights into potential responses of actors in the alcohol industry. As such, it was beyond the scope of this research to perform modelling exercises and identify more in-depth relationships. We have, however, identified where more in-depth research may provide a richer profile of the alcohol market.

An important avenue for future research is on pass-through rates from tax increases. The literature on how much taxes are passed on to consumer is still limited and more research in this area is needed as this is “a key link in the chain of causality from the tax increase” to improvements in social outcomes such as health and crime (Kenkel, 2005, p. 273). A greater understanding of pass-through rates is also important in order to develop a fuller picture of the impact of such a policy change on suppliers. Furthermore, as our study shows, research should consider not just the revenue from duties, but also VAT, and their relationship with retail prices. Further research would allow us to understand the impact of taxation on the economy.

It is beyond the scope of this paper to estimate long-run prices of alcohol. However, an interesting avenue of research would be to take into account the interdependent, dynamic relationships between actors in the alcohol market and estimate long-run, steady-state prices of alcohol. As an example of how this can be done, there have been studies on the effect of taxation on the tobacco industry using input-output models and these studies provide a more thorough understanding of the economic impacts associated with policy changes (Bank, 1999). They do this by allowing for the repeated interaction of various industries that supply and are supplied by the tobacco industry. An analysis of this type for the alcohol industry would be particularly useful to understand the long-run economic implications in terms of employment, value of trade and government revenues.

The decrease in consumption in 2008 is especially noteworthy, as prices increased substantially from the previous year. However, without further research, it is not possible to disentangle this from the overall economic situation of households and this may be due to income reduction, rather than price increase. Although beyond the scope of this research, research could identify the factors contributing to the recent reduction in total hectolitres and litres of pure alcohol consumed per capita.

The process by which alcohol reaches our alcohol shelf is not well developed in the literature. Interviews in the course of this study suggest the process starts with retailers offering producers shelf space to sell their alcohol products. Since the space is limited, in order for producers to get product on the alcohol shelf, major retailers may charge the producers a fee (that is, a listing fee) to place product on their shelf. Given that producers may pay for the shelf space, they may want some assurances that enough products are sold to make it worth it to have purchased the shelf space. With this, retailers may have sales targets that incentivise the retailers to at least meet the costs of the listing fee. It is not well understood if this is the situation for all alcohol products and brands. An avenue for further research would be to understand where costs are generated through the supply-chain to better understand the economic implications of these pricing policies.

The substitution and complementary effects in the UK are not well understood and an important avenue of research, both from an economic and policing point of view would be to better understand how changes in alcohol prices influences purchases of other goods. In particular, analysis on the consumption of other licit and illicit drugs (such as tobacco, cannabis, powder cocaine, etc) would allow us to understand how expenditure shifts and thus economic impacts from these policies.

A large research gap exists on producer and consumer surplus associated with changes in alcohol price. Studies tend to examine consumption of alcohol without considering the whole package of purchases made by consumers and their income, which would allow us to examine changes in welfare. Likewise, the focus tends to be on the elasticity of demand, and not the elasticity of supply. More research on the elasticity of supply would allow us to understand whether producers turn to exporting their products when there are reductions in consumption, for example.

This list of avenues for future research does not aim to be comprehensive, but to highlight some of the areas on which we still have limited knowledge but which could make important, and necessary, contributions to informed policy- and decision-making.

REFERENCES

Reference List

Allain, M. L. and Chambolle, C., *Loss-leaders Banning Laws as Vertical Restraints*, Cahier no. 2004-023, Paris: Ecole Polytechnique, Centre National de la Recherche Scientifique, 2004.

Anderson, P. and Baumberg, B., *Alcohol in Europe: A Public Health Perspective*, report prepared for the European Commission, London: Institute for Alcohol Studies, 2006.

Anderson, P., D. Chisholm and D. C. Fuhr, "Alcohol and Global Health 2 Effectiveness and Cost-Effectiveness of Policies and Programmes to Reduce the Harm Caused by Alcohol", *Lancet*, 373,9682, pp. 2234–2246, 2009.

Anderson, R. and Johnson, R., "Antitrust and Sales-Below-Cost Laws: The Case of Retail Gasoline", *Review of Industrial Organization* 14, pp.189-204, 1999.

Association, B. B. P., *Time to Give Beer a Break and to Back the Pub: Budget Submission 2010,* 2010.

Babor, T., R. Caetano, S. Casswell, G. Edwards, N. Giesbrecht, K. Graham, J. Grube, P. Gruenewald, L. Hill and H. Holder, "Alcohol: No Ordinary Commodity. Research and Public Policy", *Rev Bras Psiquiatr*, 26,4, pp. 280–3, 2003.

Babor, T., J. Mendelson, I. Greenberg and J. Kuenhle, "Experimental analysis of the 'happy hour': Effects of purchase price on alcohol consumption", *Psychopharmacology* 58:35–41, 1978.

Balance, *Selling Alcohol at Pocket Money Prices*, Balance, 2010.

Baltagi, B. and Goel, R., "Quais-Experimental Price Elasticity of Liquor Demand in the United States: 1960-83", *American Journal of Agricultural Economics* 72:2, pp. 451-454, 1990.

Baltagi, B. and Griffin, J., "A Dynamic Model for Liquor: The Case for Pooling", *The Review of Economics and Statistics* 77:3, pp.545-554, 1995.

Banerjee, P., "Price Intervention in a Cournot Oligopoly with a Dominant Firm", *The B.E. Journal of Theoretical Economics* 7:1, 2007.

Bank, W., *Curbing the Epidemic Governments and the Economics of Tobacco Control*, Washington D.C.: World Bank, 1999.

Baumberg, B., "How Will Alcohol Sales in the UK Be Affected If Drinkers Follow Government Guidelines?," *Alcohol Alcohol.*, 44,5, pp. 523–528, 2009.

Beard, T.R., Gant, P.A. and Saba, R.P., "Boder-Crossing Sales, Tax Avoidance and State Tax Policies: An Application to Alcohol", *Southern Economic Journal* 64, pp. 1655-1672, 1997.

Beatty, T.K.M., Sommervoll, D.E. and Larsen, E.R., *Driven to Drink: Sin Taxes Near a Border*, IDEAS, 2007 (available at: http://ideas.repec.org/p/ssb/dispap/507.html, last accessed June 2010).

Bellis, M., K. Hughes, M. Morleo, K. Tocque, S. Hughes, T. Allen, D. Harrison and E. Fe-Rodriguez, "Predictors of Risky Alcohol Consumption in Schoolchildren and their Implications for Preventing Alcohol-related Harm", *Substance Abuse Treatment, Prevention and Policy* 2:15, 2007.

Bhaskar, V., "The Competitive Effects of Price-Floors", *The Journal of Industrial Economics*, 45,3, pp. 329–340, 1997.

Biloktach, V., *Price Floors and Quality Choice*, Working Paper Series, University of California at Irvine, 2009.

Biscourp, P., Boutin, X. and Thibaud, V., *The Effects of Retail Regulations on Prices: Evidence from the Loi Galland*, IDEAS, 2008 (avaliable at: http://ideas.repec.org/p/crs/wpdeee/g2008-02.html last accessed June 2010).

Borgonovi, F. and M. C. Huerta, "Education, Alcohol Use and Abuse among Young Adults in Britain", *Social Science & Medicine*, In Press, Accepted Manuscript, 2010.

Bray, J.W., Loomis, B. and Engelen, M., "Correlared of In-Store Promotions for Beer: Differential Effects of Market and Product Characteristics", *Journal of Studies on Alcohol and Drugs*, March 2007.

Brennan, A., R. Purshouse, K. Taylor and R. Rafia, *Independent Review of the Effects of Alcohol Pricing and Promotion: Part B. Modelling the Potential Impact of Pricing and Promotion Policies for Alcohol in England: Results from the Sheffield Alcohol Policy Model. Version 2008(1-1)*, University of Sheffield, 2009.

Cameron, L. and J. Williams, "Cannabis, Alcohol and Cigarettes: Substitutes or Complements?", *The Economic Record* 77:236, pp. 19–34, 2001.

Camm, F., *Consumer Surplus, Demand Functions, and Policy Analysis*, RAND Corporation, 1983.

Centre, N. I., *Statistics on Alcohol: England, 2009*, National Health Service, Lifestyles Statistics, 2009.

Chaloupka, F., M. Grossman and H. Saffer, "The Effects of Price on Alcohol Consumption and Alcohol-Related Problems", *Alcohol Research & Health*, 26,1, pp. 22–35, 2002.

Chaloupka, F. and R. Pacula, "The Impact of Price on Youth Tobacco Use", *Changing Adolescent Smoking Prevalence: Where It Is and Why, Smoking and Tobacco Control*, 14, 2002.

Chevalier, J., A. Kashyap and P. Rossi, "Why Don't Prices Rise During Periods of Peak Demand? Evidence from Scanner Data," *American Economic Review*, 93,1, pp. 15–37, 2003a.

Chevalier, J., A. Kashyap and P. Rossi, "Why Don't Prices Rise During Periods of Peak Demand? Evidence from Scanner Data", *American Economic Review*, 93,1, pp. 15–37, 2003b.

Chikritzhs, T., K. Fillmore and T. Stockwell, "A Healthy Dose of Scepticism: Four Good Reasons to Think Again About the Protective Effects of Alcohol on Coronary Heart Disease", *Drug and Alcohol Review* 28:441–444, 2009.

Chiou, L. and E. Muehlegger, "Crossing the Line: Direct Estimation of Cross-border Cigarette Sales and the effect on tax revenue", *The B.E. Journal of Economic Analysis and Policy* **8** (1 Contributions), 2008.

Chisolm, D., J. Rehm, M. van Ommeren and M. Monteiro, "Reducing the Global Burden of Hazardous Alcohol Use: A comparative cost-effectiveness analysis", *Journal of Studies on Alcohol* 65:6, pp. 782–793, 2004.

Christie, J., Fisher, D., Kozup, J., Smith, S., Burton, S. and Creyer, E., " The Effects of Bar-Sponsored Alcoho Beverage Promotions across Binge and Nonbinge Drinkers", *Journal of Public Policy and Marketing* 20:2, 2001.

Cliquet, G., Picot-Coupey, K., Basset, G. and Perrigot, R., *Retailing in France: Overview and Key Trends / What's Up?* Glabler, 2009.

Colla, E., (2006) "Distorted Competition: Below-cost Legislation, 'Marges Arrières' and Prices in French Retailing", *International Review of Retail, Distribution and Consumer Research* 16:33, 353–373, 2006.

Collins, A. *Below Cost Legislation - Did it Matter and Would it Really Matter Today?*, paper prepared for presentation at the 113th EAAE Seminar: "A resilient European food industry and food chain in a challenging world", Greece, 2009.

Commission, C., *Supply of Beer for Retail Sale in the United Kingdom*, London: The Stationary Office, 1989.

Commission, C., *Supermarkets: A Report on the Supply of Groceries from Multiple Stores in the United Kingdom*, London: The Stationery Office, 2000.

Commission, C., "Grocery Market Investigation: Provisional Findings Report", London: The Stationery Office, 2007.

Cook, P., *Paying the Tab: The Economics of Alcohol Policy*, New Jersey: Princeton University Press, 2007.

Cook, P. and M. Moore, "The Economics of Alcohol Abuse and Alcohol-Control Policies" *Health Affairs*, 21,2, p. 120, 2002.

Corrao, G., V. Bagnardi, A. Zambon and C. La Vecchia, "A Meta-analysis of Alcohol Consumption and the Risk of 15 Diseases", *Preventive Medicine* 38:613–619, 2004.

Crawford, I. and Tanner, S., "Bringing it All Back Home: Alcohol Taxation and Cross-Border Shopping", *Fiscal Studies* 16:2, pp. 94-114, 1995.

Crawford, I. and Tanner, S., *Alcohol Taxes and the Single European Market*, London: Institute for Fiscal Studies, 1995b.

Crawford, I., Smith, Z. and Tanner, S., "Alcohol Taxes, Tax Revenues and the Single European Market", *Fiscal Studies* 20:3, pp. 287-304, 1999.

Decker, S. L. and A. E. Schwartz, "Cigarettes and Alcohol: Substitutes or Complements?", *NBER Working Paper* 7535, 2000.

Dee, T., "State Alcohol Policies, Teen Drinking and Traffic Fatalities", *Journal of Public Economics* 72:289–315, 1999.

DiNardo, J. and T. Lemieux, *Alcohol, Cannabis and Youth: The Unintended Consequences of Government Regulation*, NBER Working Paper No. 4212, 1992.

Donnelly, G., "The Impact of the Restrictive Practices (Groceries) Order on Competition in the Irish Grocery Trade", *Journal of the Statistical Society of Ireland*, vol. XXXV: 151–178, 2006.

Elder, R., B. Lawrence, A. Ferguson, T. Naimi, R. Brewer, S. Chattopadhyay, T. Toomey and J. Fielding, "The Effectiveness of Tax Policy Interventions for Reducing Excessive Alcohol Consumption and Related Harms", *American Journal of Preventive Medicine*, 38,2, pp. 217–229, 2010.

Ernst&Young, *The Contribution Made by Beer to the European Economy: Employment, Value Added and Tax*, Ernst&Young, 2009.

Farrell, S., W. Manning and M. Finch, "Alcohol Dependence and the Price of Alcoholic Beverages", *Journal of Health Economics* 22:117–147, 2003.

Farrelly, M., J. Bray, G. Arkin, B. Wendling and R. Pacula, *The Effects of Prices and Policies on the Demand for Marijuana: Evidence from the National Household Surveys on Drug Abuse*, NBER Working Paper, 1–22, 1999.

Fearne, A., *Attitudes of UK Supermarket Shoppers Towards Wine Purchasing: Executive Summary, 2009*.

Feighery, E.C., Ribisl, K.M., Schleicher, N.C., Zellers, L. and Wellington, N., "How do Minimum Cigaratte Price Laws Affect Cigarette Prices at the Retail Level?", *Tobacco Control* 14:80-85, 2005.

FitzGerald, J., Quinn, T.P., Whelan, B.J. and Williams, J.A., *An Analysis of Cross-Border Shopping*, IDEAS, 1988.

Fogarty, J., "The Nature of the Demand for Alcohol: Understanding Elasticity", *British Food Journal* 108:4, pp. 316–332, 2006.

Freeman, D.G., "Alternative panel Estimates of Alcohol Demand, Taxation, and the Business Cycle", *Southern Economic Journal* 67:2, pp. 325-344, 2000.

Gallet, C. A., "The demand for alcohol: a meta-analysis of elasticties", *Australian Journal of Agricultural and Resource Economics* 51:2, pp. 121–135, 2007.

Gmel, G. and J. Rehm, "Harmful Alcohol Use", *Alcohol Research and Health* 27:1, pp. 52–63, 2003.

Godfrey, C. and K. Hartley, "Employment." Pp.204-25 in *Preventing alcohol and tobacco problems volume 1: the addiction market*, Edited by A. Maynard and P. Tether. Aldershot, UK: Avebury, 1990.

Grossman, M., F. Chaloupka, H. Saffer and A. Laixuthai, "Effects of Alcohol Price Policy on Youth: A Summary of Economic Research", *Journal of Research on Adolescence*, 4,2, pp. 347–364, 1994.

Grunewald, P., W. Ponicki, H. Holder and A. Romelsjo, "Alcohol Prices, Beverage Quality and the Demand for Alcohol: Quality Substitutions and Price Elasticities", *Alcoholism: Clinical and Experimental Research* 30:1, pp. 96–105, 2006.

GVA, *Budget Submission by the Gin and Vodka Assocation*, Gin and Vodka Assocation, 2010.

Hastings, G., Anderson, S., Cooke, E. and Gordon, R., "Alcohol Marketing and Young People's Drinking: A Review of the Research", *Journal of Public Health Policy* 26:296-311, 2005.

Heeb, J., G. Gmel, C. Zurbrügg, M. Kuo and J. Rehm, "Changes in Alcohol Consumption Following a Reduction in the Price of Spirits: A Natural Experiment in Switzerland", *Addiction*, 98,10, pp. 1433–1446, 2003.

Helakorpi, S., P. Makela and A. Uutela, "Alcohol Consumption Before and After a Significant Reduction of Alcohol Prices in 2004 in Finland: Were the Effects Different across Population Subgroups?", *Alcohol and Alcoholism*, 2010.

Herttua, K., P. Makela and P. Martikainen, "Changes in Alcohol-Related Mortality and Its Socioeconomic Differences after a Large Reduction in Alcohol Prices: A Natural Experiment Based on Register Data", *American Journal of Epidemiology*, 168,10, pp. 1110, 2008.

HMRC, *Meeting Our Challenges: Departmental Autumn Performance Report 2009*, Surrey: HM Revenue & Customs, 2009.

HMRC, *Alcohol Factsheet 2010*, London: HM Revenue & Customs, 2010a.

HMRC, *Budget 2010, Alcohol Duty: Rates*, London: HM Revenue & Customs, 2010b.

Hoj, J., Jimenez, M., Maher, M., Nicoletti, G. and Wise, M., *Product Market Competition in the OECD Countries: Taking Stock and Moving Forward*, France: OECD, 2007.

Huang, C-D., *Econometric Models of Alcohol Demand in the United Kingdom*, Government Economic Service Working Paper No. 140, London: HM Customs and Excise, 2003.

IAS, *Economic Costs and Benefits: Alcohol Factsheets*, St Ives: Institute of Alcohol Studies, 2007.

Jacobs, R., H. F. Gale, *et al.*, *The supply-side effects of tobacco-control policies Tobacco Control in Developing Countries*, Oxford University Press for the World Bank and World Health Organization: 311, 2000.

Jimenez, S. and J. M. Labeaga, "It is Possible to Reduce Tobacco Consumption via Alcohol Taxation", *Health Economics* 3, 231–241, 1994.

Johnson, R.N., *The Impact of Sales-Below-Cost Laws on the US Retail Gasoline Market*, report prepared for Industry Canada, Competition Bureau Quebec, Canada, 1999.

Jones, S. C. and G., "The Impact of More Visible Standard Drink Labelling on Youth Alcohol Consumption: Helping Young People Drink (Ir)responsibly?" *Drug and Alcohol Review* 28:3, pp. 230–234, 2009.

Kenkel, D., Are Alcohol Tax Hikes Fully Passed Through to Prices? Evidence From Alaska", The American Economic Review 95:2, 2005.

Kerr, W. and T. Greenfield, "Distribution of Alcohol Consumption and Expenditures and the Impact of Improved Measurement on Coverage of Alcohol Sales in the 2000 National Alcohol Survey", *Alcoholism: Clinical and Experimental Research*, 31,10, pp. 1714–1722, 2007.

Koski, A., R. Sirén, E. Vuori and K. Poikolainen, "Alcohol Tax Cuts and Increase in Alcohol-Positive Sudden Deaths – a Time-Series Intervention Analysis", *Addiction*, 102,3, pp. 362–368, 2007.

KPMG, *Review of the Social Responsibility Standards for the Production and Sale of Alcoholic Drinks: Volume 1*. Report for the Home Office, 2008.

Kuo, M., J. Heeb, G. Gmel and J. Rehm, "Does Price Matter? The Effect of Decreased Price on Spirits Consumption in Switzerland", *From Science to Action? 100 Years Later – Alcohol Policies Revisited*, pp. 113–123, 2004.

Kuo, M., H. Wechsler, P. Greenberg and H. Lee, "The Marketing of Alcohol to College Students* 1: The Role of Low Prices and Special Promotions", *American Journal of Preventive Medicine*, 25,3, pp. 204–211, 2003.

Lal, R. and C. Matutes, "Retail Pricing and Advertising Strategies", *Journal of Business*, 67,3, pp.345–370, 1994.

Leal, A., Lopez-Laborda, J. and Rodrigo, F., "Cross-Border Shopping: A Survey", *International Atlantic Economic Research*, 2010.

Levy, D. and T. Miller, "Cost-Benefit Analysis of Enforcement Efforts to Reduce Serving Intoxicated Patrons", *Journal of Studies on Alcohol*, 56, pp .240–247, 1995.

Levy, D., Lee, D., Chen, H(A)., Kauffman, R. and Bergen, M., *Price Points and Price Rigidity*, Italy: The Rimini Centre for Economic Analysis, 2007.

Lockwood, B. and Migali, G., "Did the Single Market Cause Competition in Excise Taxes? Evidence from EU Countries", *The Economic Journal* 119:406-429, 2009.

Ludbrook, A., *Purchasing Patterns for Low Price Off Sales Alcohol: Evidence From the Expenditure and Food Survey*, Paper for Scottish Health Action on Alcohol Problems, University of Aberdeen, Aberdeen, 2010.

Mahajan, S., "Concentration Ratios for Businesses by Industry in 2004", *Economic Trends*, 635, 2006a.

Mahajan, S., "Concentration Ratios for Businesses by Industry in 2004", *Economic Trends*, 635, pp. 25–47, 2006b.

Mäkelä, P., K. Bloomfield, N. Gustafsson and R. Room, “Effects of Major Changes in Alcohol Availability”, 2007.

Mäkelä, P., E. Österberg and F. Helsinki, “Ill Effects of Alcohol Tax Cuts in Finland in 2004”, *Addiction*, 104,4, pp. 554–563, 2009.

Marx, L.M. and Shaffer, G., "Predatory Accommodation: Below-Cost Pricing without Exclusion in Intermediate Goods Markets", *The RAND Journal of Economics* 30:1, pp. 22-43, 1999.

Meier, P., R. Purshouse and A. Brennan, “Policy Options for Alcohol Price Regulation: The Importance of Modelling Population Heterogeneity”, *Addiction*, 105,3, pp. 383–393, 2009.

Menezes-Filho, N., “Is the Consumer Sector Competitive in the U.K.? A Test Using Household-Level Demand Elasticities and Firm-Level Price Equations”, *Journal of Business and Economic Statistics*, 23,3, pp. 295–304, 2005.

Model, K., *Crime, Violence and Drug Control Policy*, Working Paper, Department of Economics, Harvard University, 1991.

Model, K., “The Effects of Marijuana Decriminalization on Hospital Emergency Room Episodes: 1975–1978”, *Journal of the American Statistical Association* 88:423, pp. 737–747, 1993.

National Audit Office, *Reducing Alcohol Harm: Health Services in England for Alcohol Misuse*, National Audit Office, UK, 2008.

NHS, *Statistics on Alcohol: England, 2009*, National Health Service Information Centre, Lifestyles Statistics, 2009.

Nordlund, S. and Osterberg, E. "Unrecorded Alcohol Consumption: its Economics and its Effects on Alcohol Control in the Nordic Countries", *Addiction* 94:S4, pp.S554-S564, 2000.

OECD, *The Economic Impact of Counterfeiting and Piracy: Executive Summary*, Organization for Economic Co-operation and Development, 2007.

ONS, *Consumer Price Indices Technical Manual: 2007 Edition*, Office for National Statistics, 2007a.

ONS, *Product Sales and Trade: Pra 15910 Distilled Potable Alcoholic Beverages 2007*, Office for National Statistics, 2007b.

ONS, *Family Spending: A Report on the 2008 Living Costs and Food Survey*, South Wales: Office for National Statistics, 2009.

ONS, *Focus on Consumer Price Indices: Data for March 2010*, Office for National Statistics, 2010.

Osborne, M.J., *An Introduction to Game Theory*, Oxford: Oxford University Press, 2004.

Pacula, R. “Does Increasing the Beer Tax Reduce Marijuana Consumption?”, *Journal of Health Economics*, 17,5, pp. 557–585, 1998.

Pacula, R. and F. Chaloupka, “The Effects of Macro-Level Interventions on Addictive Behavior”, *Substance Use & Misuse*, 36,13, pp. 1901–1922, 2001.

Pape, H., I. Rossow and E. Storvoll, “Under Double Influence: Assessment of Simultaneous Alcohol and Cannabis Use in General Youth Populations”, *Drug and Alcohol Dependence* 101:69–73, 2009.

Peele, S. and A. Brodsky, “Exploring Psychological Benefits Associated with Moderate Alcohol Use: A Necessary Corrective to Assessments of Drinking Outcomes?”, *Drug and Alcohol Dependence* 60:3, pp. 221–247, 2000.

Picone, G. A., F. Sloan and J. G. Trogdon, “The Effect of the Tobacco Settlement and Smoking Bans on Alcohol Consumption”, *Health Economics* 13:1063–1080, 2004.

Ponicki, W., H. Holder, P. Gruenewald and A. Romelsjo, "Altering Alcohol Price by Ethanol Content: Results from a Swedish Tax Policy in 1992”, *Addiction*, 92,7, pp. 859–870, 1997.

Porter, M. E., “The Five Competitive Forces That Shape Strategy”, *Harvard Business Review*, 86,1, pp. 78–93, 2008.

Prime Minister's Strategy Unit, *Alcohol Harm Reduction Strategy for England*, London: Cabinet Office, 2004.

Purshouse, R., Meier, P.S., Brennan, A., Taylor, K.B. and Rafia, R., "Estimated Effect of Alcohol Pricing Policies on Health and Health Economic Outcomes in England: an Epidemiological Model", *Lancet* 375:1355-64, 2010.

Rabinovich, L., P. Brutscher, H. de Vries, J. Tiessen, J. Clift and A. Reding, “The Affordability of Alcoholic Beverages in the European Union: Understanding the Link between Alcohol Affordability, Consumption and Harms”, 2009.

Record, C. and Day, C., "Britain's Alcohol Market: How Minimum Alcohol Prices Could Stop Moderate Drinkers Subsidising Those Drinking at Hazardous and Harmful Levels", *Clinical Medicine* 9:5, pp.421-5, 2009.

Rehm, J., R. Room, K. Graham, M. Monteiro, G. Gmel and C. Sempos, “The Relationship of Average Volume of Alcohol Consumption and Patterns of Drinking to Burden of Disease: an Overview”, *Addiction* 98:9, pp. 1209–1228, 2003.

Rehn, N., Room, R. and Edwards, G., *Alcohol in the European Region - Consumption, Harm and Policies*, Geneva: World Health Organization, 2001.

Report, W. D., *Wine and Spirit Trade Association: Market Report*, Wilson Drinks Report, 2010.

Rotemberg, J. J. and G. Saloner, “A Supergame-Theoretic Model of Price Wars During Booms”, *American Economic Review*, 76,3, pp. 390–407, 1986.

Saffer, H. and F. Chaloupka, “Demographic Differentials in the Demand for Alcohol and Illicit Drugs”, *The Economic Analysis of Substance Use and Abuse: An Integration of Econometric and Behavioral Economic Research*, 1999.

Scherer, F.M., *et al*., *The Economics of Multi-Plant Operation: An Inteernational Comparison Study*, Massachusets: Harvard Economic Studies, 1975.

Skidmore, M., Peltier, J. and Alm, J., " Do State Motor Fuel Sales-Below-Cost Laws Lower Prices?", *Journal of Urban Economics* 57:189-211, 2005.

Slade, M., "Market Power and Joint Dominance in U.K. Brewing", *Journal of Industrial Economics*, 52,1, pp. 133–163, 2004.

Smith, H., "Store Characteristics in Retail Oligopoly", *The RAND Journal of Economics*, 37,2, pp. 416–430, 2006.

Smith, Z., *The Revenue Effect of Changing Alcohol Duties*, Briefing Note No. 4, London: Institute for Fiscal Studies, 1999.

Stehr, M., "The effect of Sunday sales bans and excise taxes on drinking and cross-border shopping for alcoholic beverages", *National Tax Journal* 60:1, pp. 85–105, 2007.

Stringham, E. and I. Pulan, "Evaluating Economic Justifications for Alcohol Restrictions", *The American Journal of Economics and Sociology*, 65, pp. 971–990, 2006.

Sutton, M. and C. Godfrey, "A Grouped Data Regression Approach to Estimating Economic and Social Influences on Individual Drinking Behaviour", *Health Economics*, 4,3, pp. 237–247, 2006.

Swann, D., *The Economics of the Common Market*, 8th Edition, Harmondsworth: Penguin, 1992.

Tauchmann, H., S. Gohlmann, T. Requate and C. Schmidt,*Tobacco and Alcohol: Complements or Substitutes? A Statistical Guinea Pig Approach*, Discussion Paper, Essen: RWI, 2006.

Thies, C. and C. Register, "Decriminaliation of Marijuana and the Demand for Alcohol, Marijuana and Cocaine", *Social Science Journal* 30:4, pp. 385–399, 1993.

Tyagi, R. K., "Why Do Suppliers Charge Larger Buyers Lower Prices?", *The Journal of Industrial Economics*, 49,1, pp. 45–61, 2001.

Wagenaar, A. C., M.J. Salois and K. A. Komro, "Effects of Beverage Alcohol Price and Tax Levels on Drinking: A Meta-Analysis of 1003 Estimates from 112 Studies", *Addiction*, 104,2, pp. 179–190, 2009.

Walsh, B. M., "Alcoholic Beverages in Ireland: Market Forces and Government Policy", *British Journal of Addiction*, 84,10, pp. 1163–1171, 1989.

Warner, E. J. and R. B. Barsky,"The Timing and Magnitude of Retail Store Markdowns: Evidence from Weekends and Holidays", *Quarterly Journal of Economics*, 110,2, pp. 321–352, 1995.

WSTA, *Swa Budget Submission 2010: Excise Duty-Time for Review*, Wine Spirits and Trade Assocation, 2010.

Young, D.J. and Bielinska-Kwapisz, A., "Alcohol Taxes and Beverage Prices", *National Tax Journal* LV:1, pp. 57-73, 2002.

Zhao, X. and M. N. Harris, "Demand for Marijuana, Alcohol and Tobacco: Participation, Levels of Consumption and Cross-equation Correlation", *The Economic Record* 80:394-410, 2004.

APPENDICES

Appendix A: Extended theoretical analysis

Theoretical framework

To start, it is worth setting the general framework for how prices are determined in a market. Generally speaking, price is a reflection of the supply and demand for a good or service. For each price of alcohol, consumers have an amount they are willing to buy (the demand curve) and producers have an amount they are willing to sell (the supply curve). As illustrated in Figure A-1, most demand curves are downward sloping, indicating that people want to purchase less when the price increases. The equilibrium price we observe (P_0) is the point at which the amount consumers are willing to spend equals the price at which producers are willing to sell.

When prices increase (to P_1), the producers want to supply more alcohol; however, the consumers cannot afford as much as producers want to supply so there is a surplus. Conversely, when prices fall (to P_0), consumers demand more alcohol, but producers cannot supply that quantity of alcohol at that price.

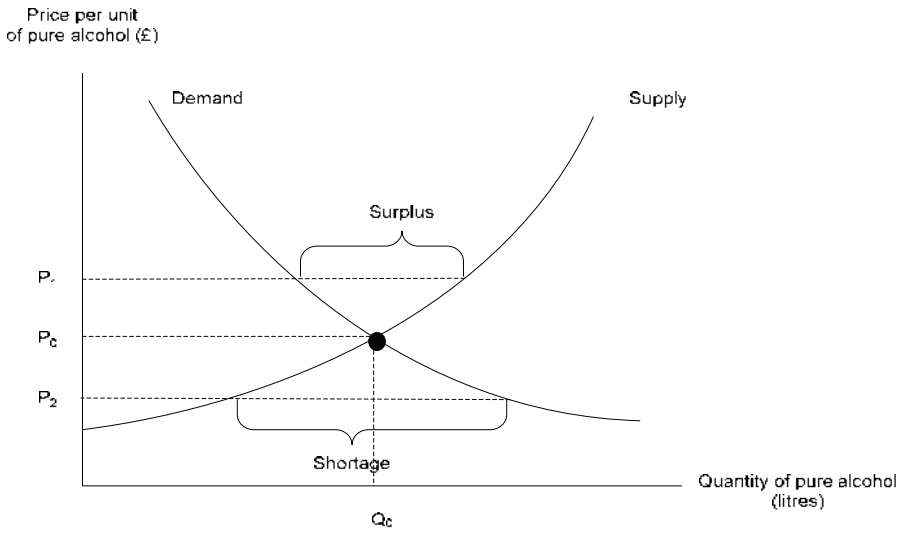

Figure A-1: Supply and demand of alcohol

When prices are lower (P_2) than equilibrium, then we experience 'shortages', where suppliers are not willing to sell as much alcohol as consumers demand. Assuming we are

currently operating with equilibrium prices (P_0), any price increase of the policies will lead to consumers demanding less alcohol than industry would like to supply and therefore a 'surplus' of alcohol. This may appear as high inventories or pressures on producers to find ways to sell more alcohol than consumers seem to be willing to buy.

Supply in an oligopoly market

Supply in an oligopoly is relatively inelastic and means the 'surplus' would be relatively smaller than in a perfect and monopolistic competition market structure. This is illustrated in Figure A-2 in which an increase of prices from P_0 to P_1 (due to policy) will have a smaller surplus effect when there is inelastic supply (S_I) than elastic supply (S_E). Theoretically, therefore, the alcohol industry would supply less with the introduction of a price floor and experience a smaller surplus than could be expected, if it were a perfect or monopolistic competition market structure, yet more than if it were a monopoly market.

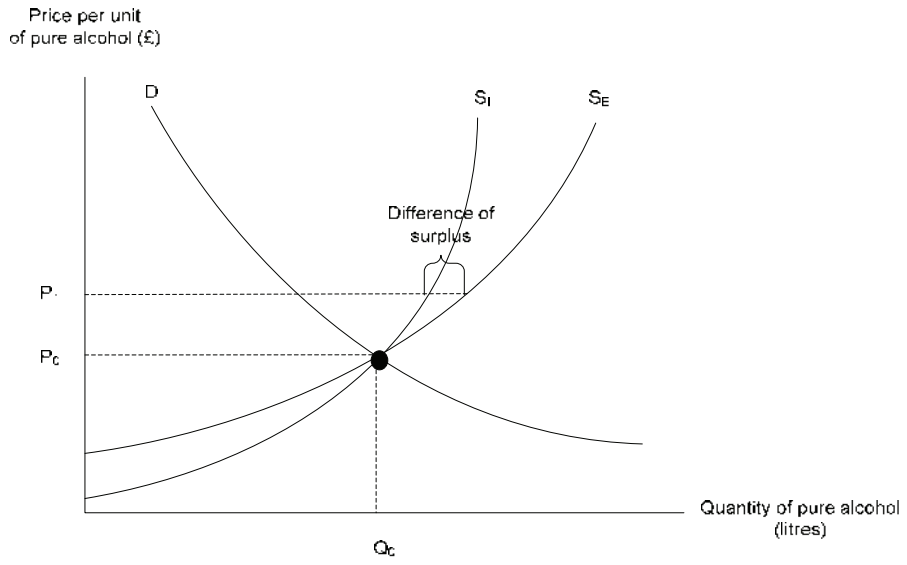

Figure A-2: Effects of a price floor with elastic versus inelastic supply

How might industry respond?

In oligopolies, firms are strategic in that they take into account their competitors' behaviour when determining prices. In order to understand how the alcohol industry might behave with regard to the current proposed policies, we turn to the game theory literature, which offers insights into how firms strategically interact to each other to determine quantity and/or price.

With evidence suggesting the alcohol industry is an oligopoly, the literature finds firms in these markets can compete on quantity of output (for example Cournot model of oligopoly) or strategically determine price (for example Bertrand model of oligopoly).

Specifically, "[i]n Cournot's game, each firm chooses an output; the price is determined by the demand for the good in relation to the total output produced. In an alternative model of oligopoly, Bertrand (1883) demonstrates how each firm chooses a price and produces enough output to meet the demand it faces, given the prices chosen by all the firms" (Osborne, 2004).

Minimum pricing and below-cost sales ban

In order to illustrate what this might mean for the alcohol industry, supposing we consider that each producer chooses the price they are willing to sell at and produces enough to meet the demand from retailers at that price (for example a Bertrand game). If a price floor is introduced, those below it may choose the price floor as the offer price and then produce enough to meet the amount demanded by retailers. Those above the price floor may keep prices as they are and produce the amount demanded by retailers. For these producers, the demand may exceed the amount they are willing to produce if they kept prices so close to other products. As a result, marginal profits may fall, such that they would actually want to offer a higher price.

Now supposing a government-imposed price floor means the final price is actually determined through the amount of output all the producers can deliver (in other words, they play a Cournot game). That is, each firm chooses the amount of alcohol they are willing to supply. The final price is determined by how much alcohol individuals demand compared with how much all producers supply.

If it is the latter competition, then prices will be higher than in the previous type of competition (Osborne, 2004).

Economic Surpluses – consumers and producers

The overall societal benefit received from the sale and purchase of goods or services is known as 'economic surplus'. Economic surplus comprises consumer and producer surplus and will allow us to discuss potential welfare winners and losers from a change in price. Furthermore, we have a framework for considering the bargaining of consumers and industry as each attempts to gather more surplus.

Consumer Surplus

As the policy options will affect alcohol prices, we want a measure of how much consumers will benefit or be 'harmed' by a price increase; in particular, whether low-income and moderate consumers are made worse off and by how much. Consumer surplus is "a monetary measure of the difference between what an individual pays for consuming a good or service and the amount he is willing to pay, given his income and the prices he faces...Policies that change his income or the price he faces can change the amount of net benefit he receives from consumption and his monetary valuation of that benefit" (Camm, 1983):1.

This is illustrated in the figure below in which demand (supply) of alcohol increases (increases) as the price decreases. If the price were to decrease, then the amount of consumer surplus would increase (the triangle of consumer surplus would increase). On the other hand, when there is little alcohol available because the price increases, people are willing to pay more than the actual price and suppliers know this, so they begin supplying

more and more into the market until the price people are willing to pay matches the actual price.

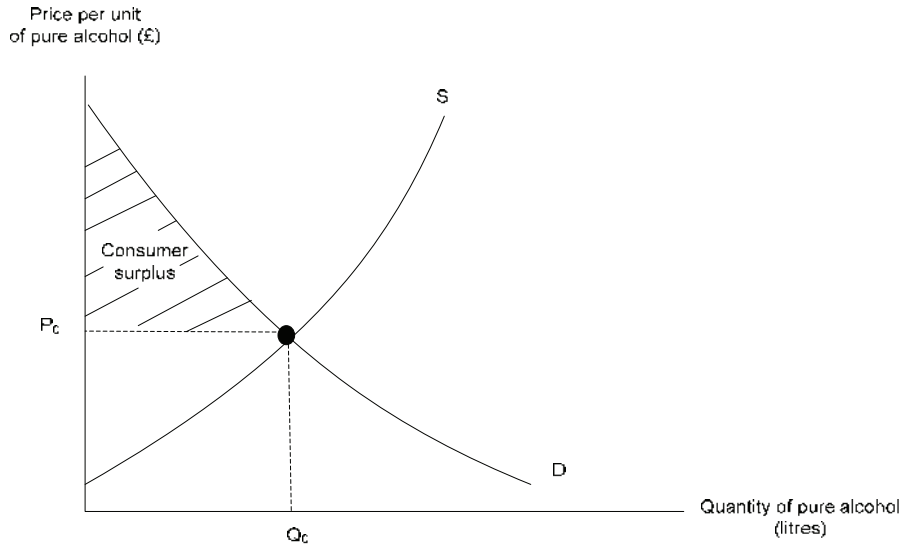

Figure A-3: Illustration of consumer surplus

Producer Surplus

On the producer side, the policy options are designed to adjust prices and thus will affect the price at which producers are willing and able to supply alcohol and the price they will receive. The difference between the benefit that producers receive from selling alcohol after the pricing intervention and the benefit they received before the pricing intervention is the change in producer welfare (or surplus).

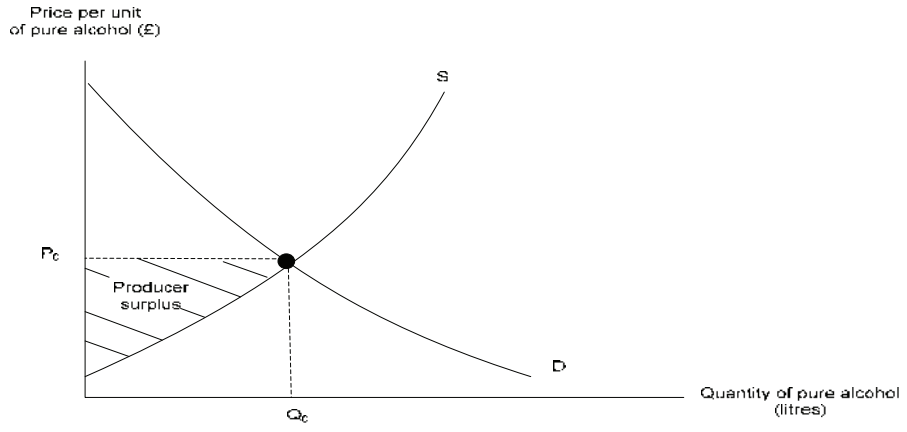

Figure A-4: Illustration of producer welfare or surplus

Total Surplus and deadweight welfare lost with introduction of a price floor

So what will happen to welfare with an increase in price? Changes in welfare can accrue to producers and consumers in what is known as deadweight loss. This is the amount of

welfare lost with a higher than equilibrium price (in this case due to government intervention). The area of the triangle is the amount of money that society looses.

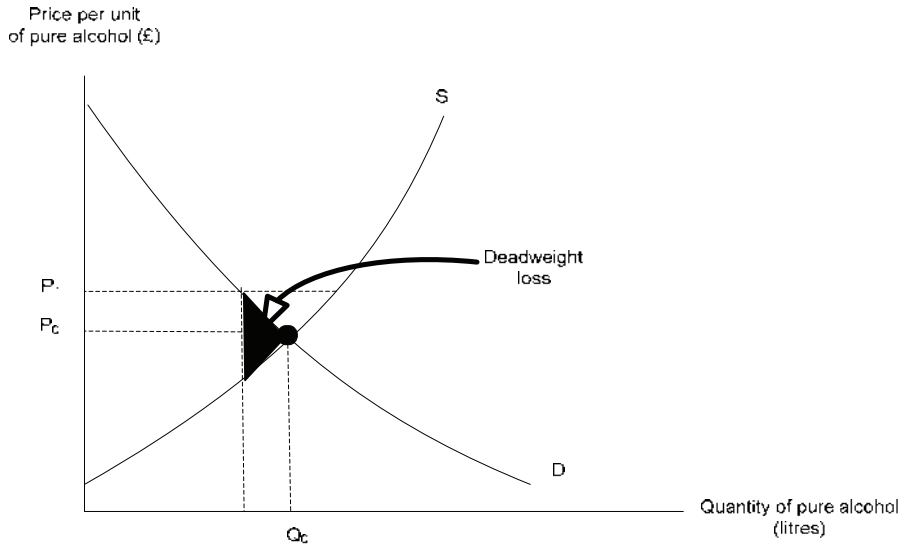

Figure A-5: Illustration of changes in welfare due to price floor

One way to measure changes in welfare or 'utility' associated with an increase in price would be to identify the change in utility; however, 'utils' are not directly observable and require modelling beyond the scope of this study. We can, however, use pounds sterling to represent the harms on consumers through calculations of consumer surplus.

The way to calculate the consumer surplus is through compensating variation and equivalent variation. In particular, compensating variation refers to the amount of extra money a 'planner' would need to give to a consumer to fully offset the welfare reduction of the alcohol price increase. Equivalent variation would refer to the amount of money that a central planner would need to take away from a consumer to harm the consumer by as much as the increase in price of alcohol. In essence, each measure provides the income effect associated with a change in the price of alcohol relative to other goods and answers the question:

How much of a change in income is necessary to offset a change in alcohol price so that a consumer's utility remains at a given level?

The key assumption so far is that the costs and benefits of consuming alcohol accrue to the consumers and sellers. However, we can also relax this assumption and consider that there may be those positively and negatively affected by others consuming alcohol. For example, alcohol consumption may cause negative externalities in the form of traffic accidents, disorderly conduct, and health costs (Anderson and Chisholm, 2009; Babor *et al.*, 2003). As the price of alcohol does not take into account these costs, the price of alcohol is lower than socially optimal and the market output is higher than socially optimal output. As

illustrated in the figure below, Figure A-6, increasing the price from P_0 to P_1 may bring the quantity consumed more in line with the social costs associated with alcohol consumption.

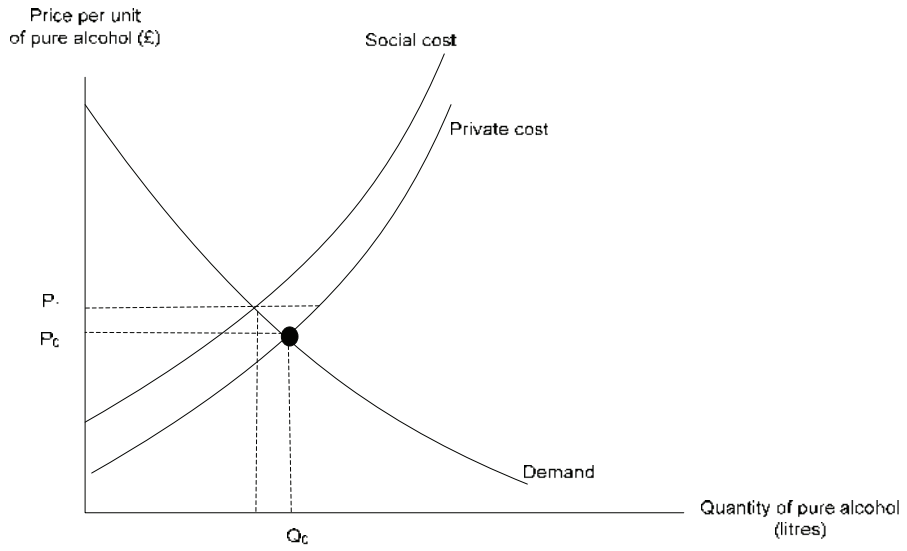

Figure A-6: Social and private costs of alcohol consumption

On the other hand, it is important to be clear about the private and social costs and consider the producer and consumer surpluses. Stringham and Pulan (2006) demonstrate that this is particularly important in the field of alcohol policy evaluation, as they find Levy and Miller's (1995) analysis included various private costs that were actually social costs (as a (Stringham and Pulan (2006) survey instrument identified) and limited costs to police expenditure, thereby completely dismissing policy induced changes to producer and consumer surpluses. When Stringham and Pulan (2006) alter Levy and Miller's (1995) assumptions, the finding of efficiency of restricting alcohol broke down.

Unintended consequences

The intent of the pricing policies is to reduce alcohol-related harms; however, there may be other positive and negative outcomes resulting from the implementation of such a policy.

The Government's objective of the pricing policies is to reduce harms. It has been demonstrated that consumers are likely to reduce alcohol consumption following an increase in prices; however, it is possible that this money is spent on other substances. The increased prices may make other substances more attractive and not have the overall effect of reducing harms. In particular, if consumption of other substances causes equal or greater harm, then an unintended consequence would be no change or an increase in harm.

In both economic and public health terms, smuggling and counterfeiting is an international issue and an unintended consequence of increasing the price of alcohol. With cheaper alcohol available, consumption increases (and literature has established a link

between poor health outcomes and consumption) and smuggled products are not subject to taxation, thus reducing government's revenues. Furthermore, there is a loss in revenues for producers with costs (for example labour, rent, etc) to reconcile. According to the OECD,

"[t]ax collection is presumed to be far more effective from rights holders and their licensees than from counterfeiters and pirates. Potential losses include corporate income taxes, sales or value added taxes, excise taxes, import tariffs and social insurance charges. The revenue losses are particularly high in sectors such as tobacco and alcohol, where excise taxes are high and smuggling of counterfeit products to avoid those taxes is widespread" (OECD, 2007).

On the other hand, there may be positive unintended consequences. If people spend less money on alcohol and more money on growth industries, then the redirection of money will lead to further economic growth.

Appendix B: Descriptive statistics of the alcohol market and consumption

Statistics on VAT + duty and retail prices

The below-cost sales ban may be based on 'VAT + duty'; therefore we present statistics on how these two components have changed over time for specific drinks. The statistics are from HM Revenue and Customs, which records the quantity of goods cleared, the amount of duty collected and taxation on alcohol in the UK.

For the following set of statistics in this section, from 1995 to 1999, the retail price relates to January each year; for 2000 onwards, the statistics relate to April.

The retail price data cover all items available in the retail outlet. The original retail price data presented by the HMRC are derived from the Office for National Statistics' retail price index basket of goods.

In order to uncover the magnitude of the relationship between excise duties and retail prices, we perform basic regression analysis. Using Ordinary Least Squares (OLS) technique, we regress the *log of real retail prices* on the *log of excise duties*. This will tell us the percentage change in retail prices for a percentage change in excise duties. This analysis does not identify the cause of changes in retail prices.

On-trade

The HMRC provides statistics on pints of lager and bitter, which we present here.

Lager and bitter

Nominal prices on a pint of lager have steadily increased since 1987, while excise duties and VAT have increased slightly.

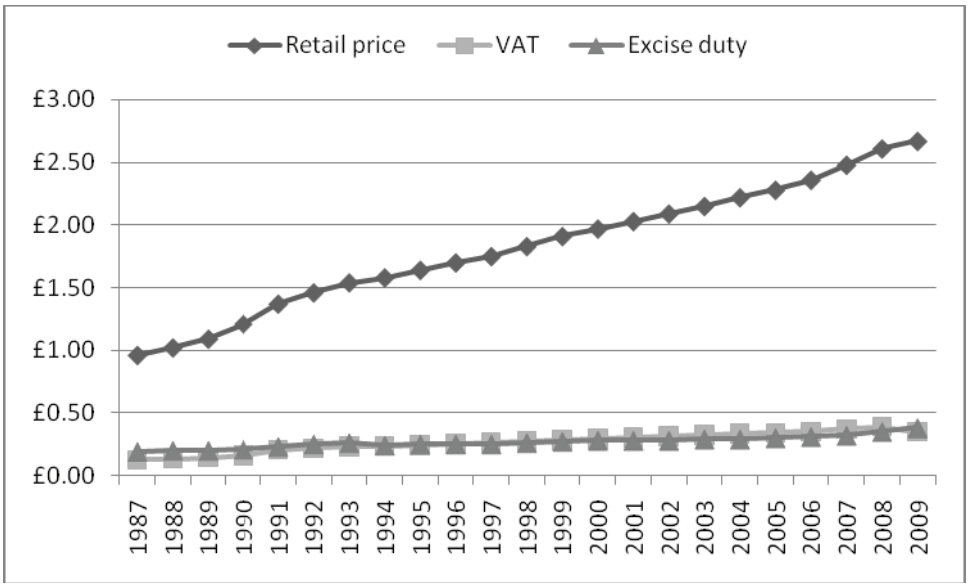

Figure B-1: Taxation and retail prices on a pint of beer (lager), 1987–2009

Source: (HMRC, 2010a)

The relationship between duty and retail prices for a pint of lager would suggest a non-linear relationship such that duty beyond £0.35 resulted in a smaller change in prices than for duty less than £0.35.

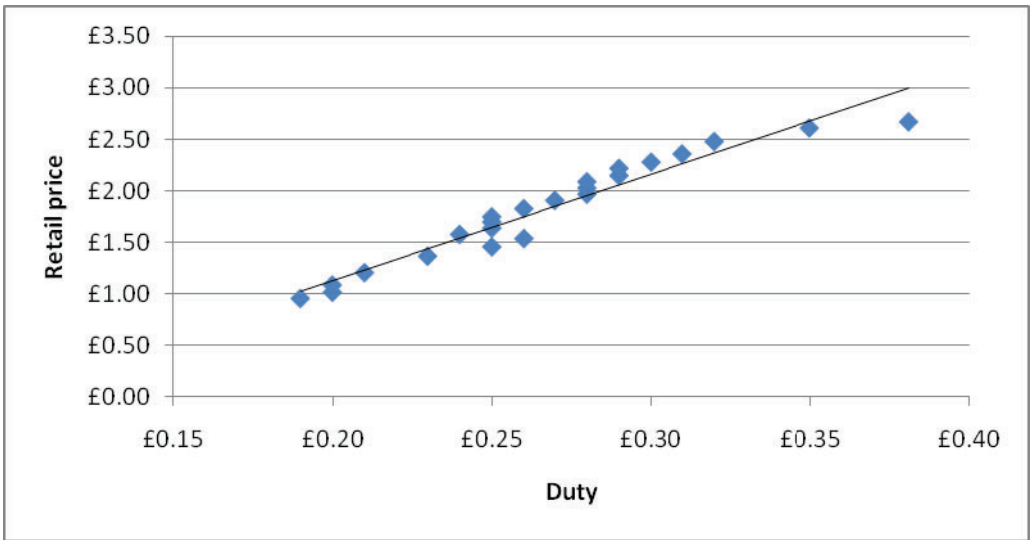

Figure B-2: Relationship between duty and retail prices on a pint of beer (lager), 1987–2009

Source: (HMRC, 2010a)

In terms of the value of the relationship between excise duty and retail price, we identify the slope of the line in the above figure (in terms of percentages). Estimates suggest that a 10 percent increase in real excise duties is associated with approximately 13 percent increase in real retail price. This suggests there is more than full pass-through in on-licence sales of lager.

Table B.1: Result of OLS regression for association between excise duty and retail price, pint of beer (lager), 1987–2009

Dependent variable: Log real retail price	
Log real excise duty	1.313***
	(0.0322)
Constant	2.171***
	(0.0308)
Observations	23
R-squared	0.988
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1	

As compared with a pint of lager, a pint of bitter has experienced a recent decrease in the retail price, with slight increase in excise duty and slight decrease in VAT.

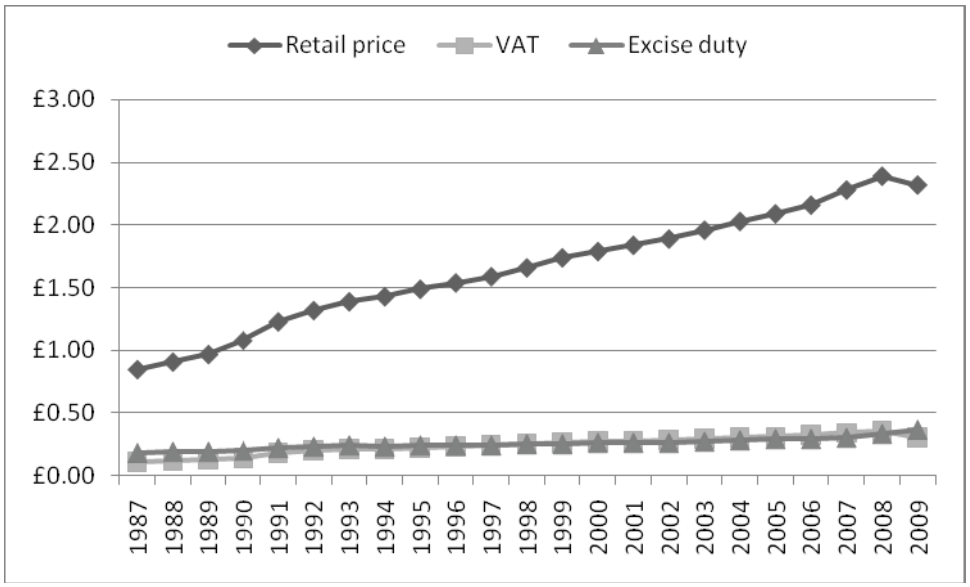

Figure B-3: Taxation and retail prices on a pint of beer (bitter), 1987–2009

Source: (HMRC, 2010a)

Similar to a pint of a lager, however, the relationship between duty and retail prices for a pint of bitter would suggest a non-linear relationship such that duty beyond £0.35 resulted in a decrease of retail prices.

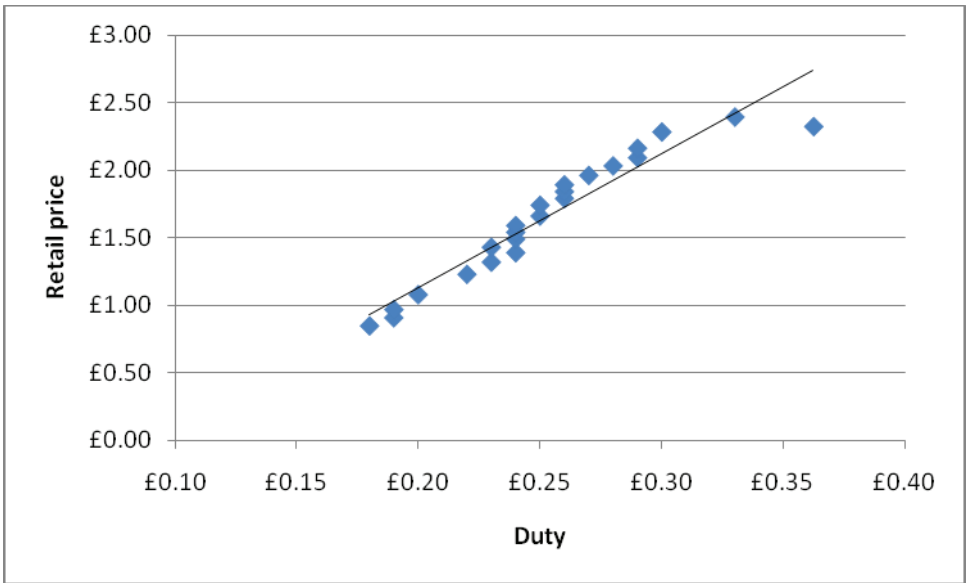

Figure B-4: Relationship between duty and retail prices on a pint of beer (bitter), 1987–2009

Source: (HMRC, 2010a)

In terms of the value of the relationship between excise duty and retail price, we identify the slope of the line in the above figure (in terms of percentages). Estimates suggest a 10 percent increase in real excise duties is associated with approximately 13 percent increase in real retail price. This is nearly identical to that for a pint of lager.

Table B.2: Result of OLS regression for association between excise duty and retail price, pint of beer (bitter), 1987–2009

Dependent variable: Log real retail price	
Log real excise duty	1.334***
	(0.0371)
Constant	2.163***
	(0.0374)
Observations	23
R-squared	0.984
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1	

Off-trade and supermarkets

HMRC provides statistics on retail prices at 'retail outlets', which we present here.

Spirits

The following set of statistics is for whisky and vodka. It is worth noting that the strength of alcohol by volume for whisky is 40% and for vodka it is 37.5%. This may influence the relationship between price and taxation.

In the late 1980s, with little change in VAT or duties, there were fairly large increases in retail prices of whisky. Between 1991 and 2006, whisky prices remained relatively stable, as

did taxes. Recent increases in excise duties with little change in VAT were met with increases in retail prices.

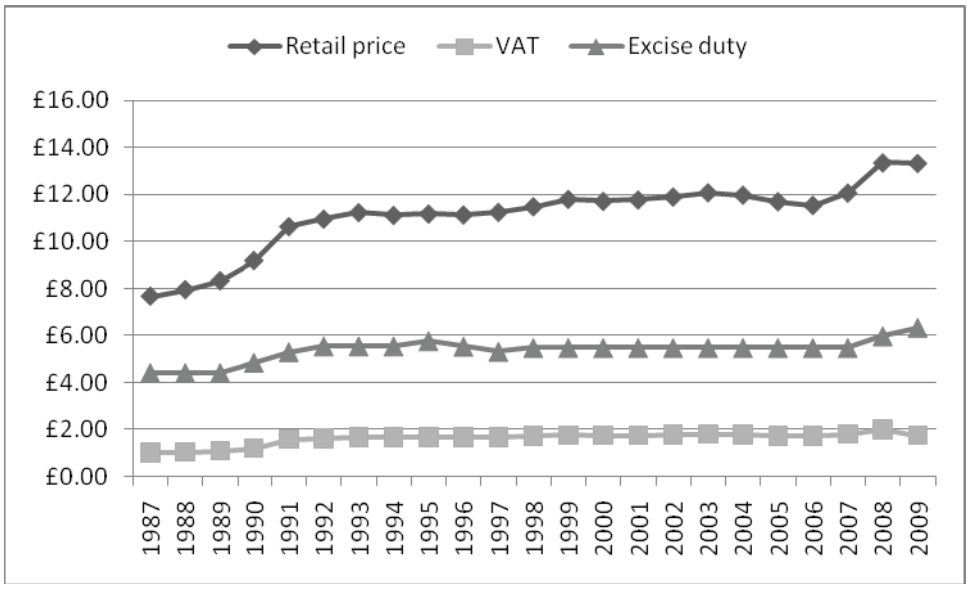

Figure B-5: Taxation and retail prices on whisky per 70cl bottle, 1987–2009

Source: (HMRC, 2010a)

In terms of any observable relationship between retail price and duties, the following figure illustrates that higher excise duties for whisky are associated with higher retail prices.

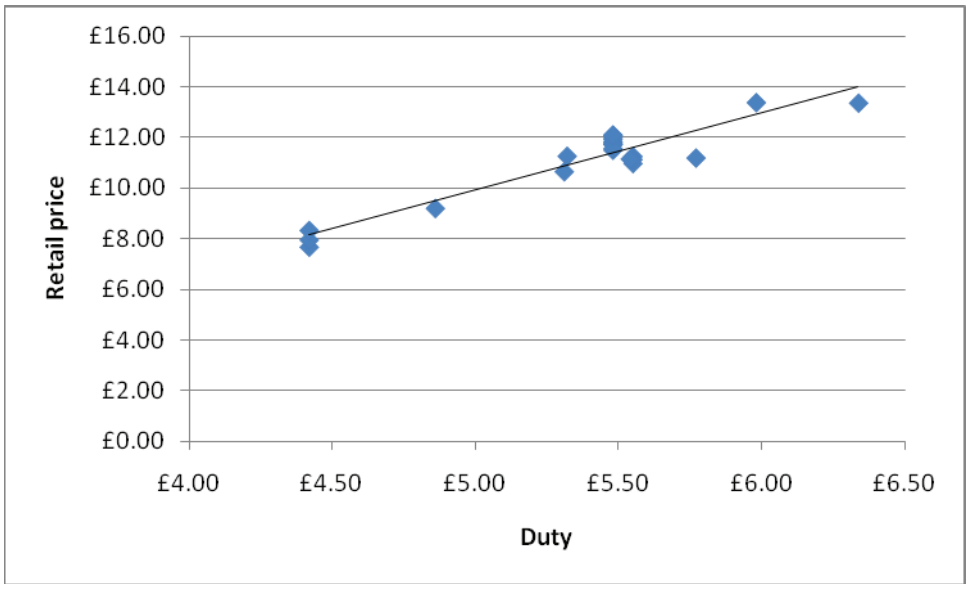

Figure B-6: Relationship between duty and retail prices on whisky per 70cl bottle, 1987–2009

Source: (HMRC, 2010a)

In terms of the value of the relationship between excise duty and retail price, we identify the slope of the line in the above figure (in terms of percentages). Estimates suggest that a 10 percent increase in real excise duties is associated with an approximately 12 percent increase in the real retail price. This is more than full pass-through.

Table B.3: Result of OLS regression for association between excise duty and retail price, whisky (70cl bottle), 1987–2009

Dependent variable: Log real retail price	
Log real excise duty	1.213***
	(0.0222)
Constant	0.264***
	(0.0478)
Observations	23
R-squared	0.993
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1	

Nominal prices and taxes have remained relatively stable since 1996. Recent increases in excise duties, with little change in VAT, were met with increases in retail prices.

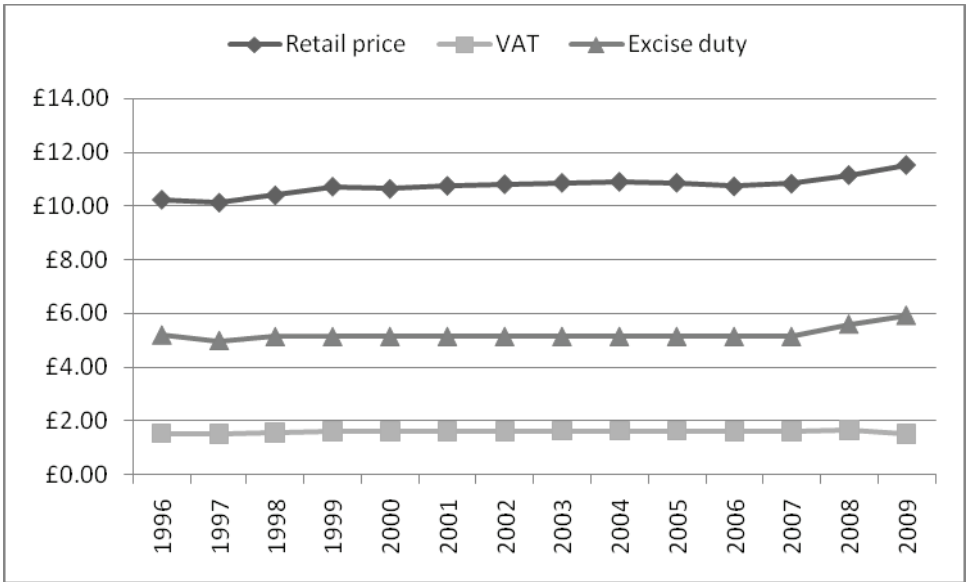

Figure B-7: Taxation and retail prices on vodka per 70cl bottle, 1996–2009

Source: (HMRC, 2010a)

In terms of any observable relationship between retail price and duties, the following figure illustrates that there is little discernable association between taxation and retail prices for vodka. However, with a jump in duties, such that there have not been duties between £5.20 to £5.60, it may be that increases in duties are associated with increase in prices.

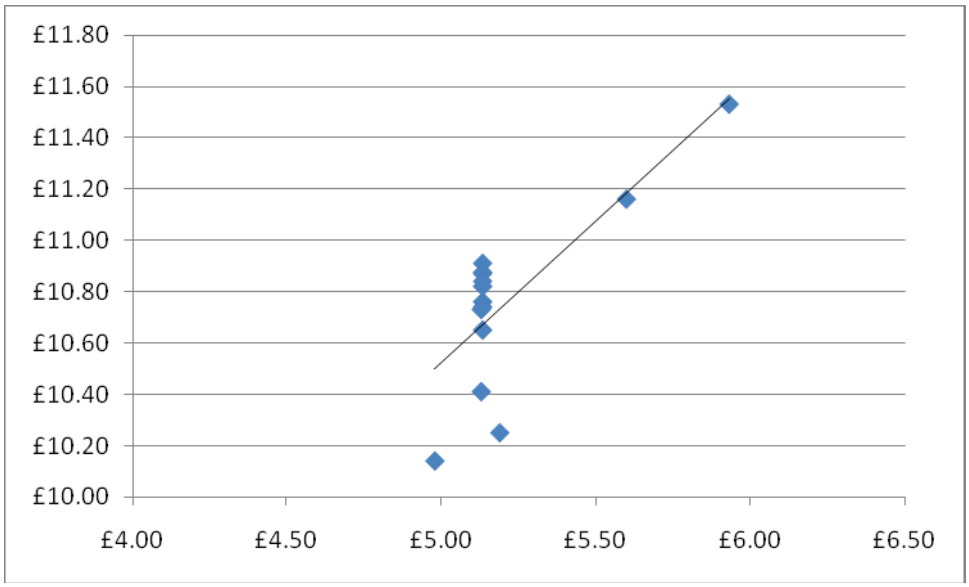

Figure B-8: Relationship between duty and retail prices on vodka per 70cl bottle, 1996–2009

Source: (HMRC, 2010a)

In terms of the value of the relationship between excise duty and retail price, we identify the slope of the line in the above figure (in terms of percentages). Estimates suggest a 10 percent increase in real excise duties is associated with an approximately 9.5 percent increase in the real retail price. This is nearly full pass-through, although less than that of whisky.

Table B.4: Result of OLS regression for association between excise duty and retail price, vodka (70cl bottle), 1996–2009

Dependent variable: Log real retail price	
Log real excise duty	0.953***
	(0.0567)
Constant	0.830***
	(0.127)
Observations	14
R-squared	0.959
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1	

Lager and cider

Prices and taxes on lager (4 x 440ml cans) have increased and decreased over the period 1987 to 2009. Recent increases in excise duties with little change in VAT were met with increases in retail prices.

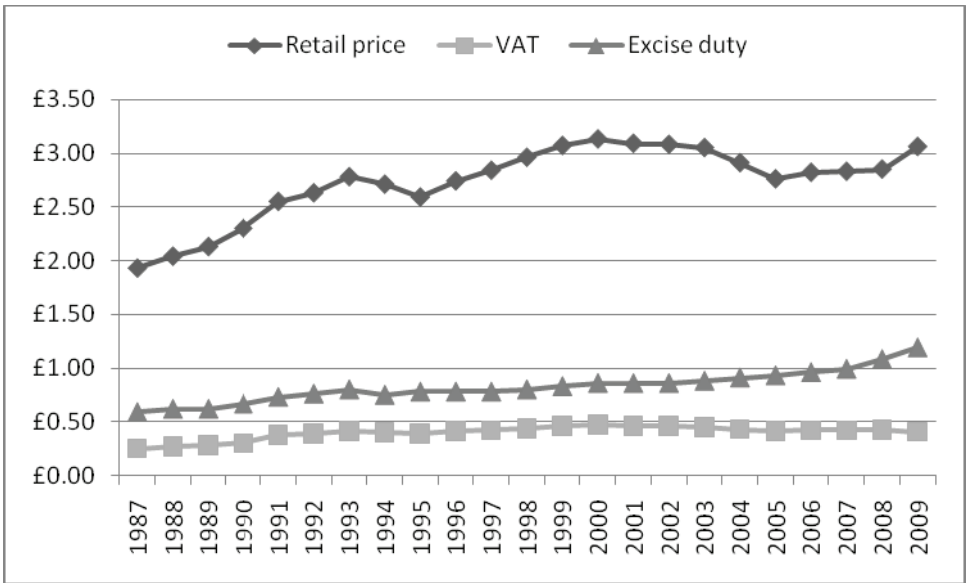

Figure B-9: Taxation and retail prices on lager (4 x 440ml cans), 1987–2009

Source: (HMRC, 2010a)

The relationship between duty and retail prices for lager would suggest a non-linear relationship, such that duty beyond £0.90 resulted in a reduction of retail prices. However, prices rose again when duties rose beyond £1.00. This may be a result of changes in VAT, rather than duty; from 2000 to 2005 prices fell, while duty increased and VAT was stable and then decreased.

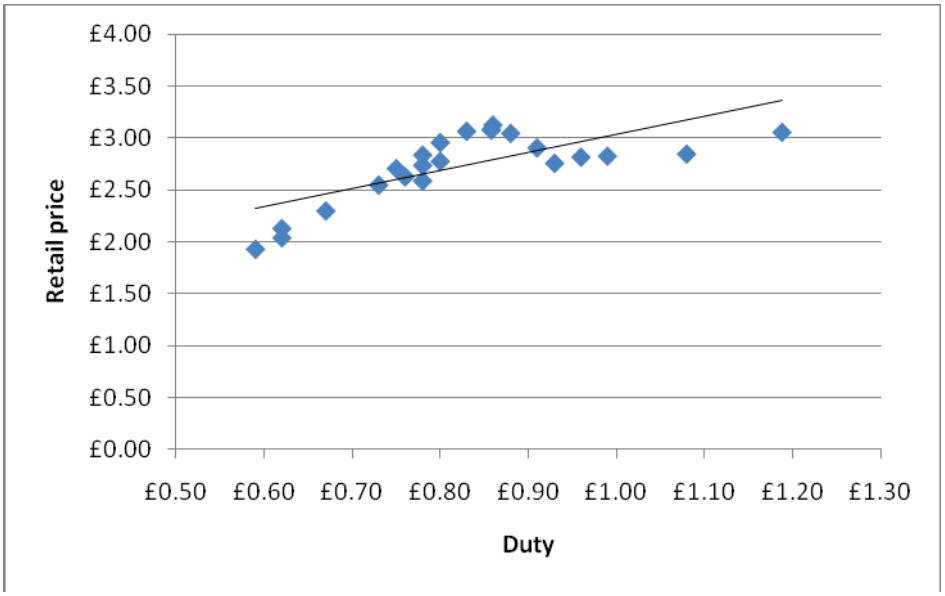

Figure B-10: Relationship between duty and retail prices on lager (4 x 440ml cans), 1987–2009

Source: (HMRC, 2010a)

In terms of the value of the relationship between excise duty and retail price, we identify the slope of the line in the above figure (in terms of percentages). Estimates suggest that a 10 percent increase in real excise duties on cans of lager is associated with an approximately

8.5 percent increase in the real retail price. As we show later, this is similar to table wine (8.6 percent).

Table B.5: Result of OLS regression for association between excise duty and retail price, lager (4 x 440ml cans), 1987–2009

Dependent variable: Log real retail price	
Log real excise duty	0.848***
	(0.0501)
Constant	1.239***
	(0.0226)
Observations	23
R-squared	0.932
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1	

Regarding cider, the retail price has steadily increased, while taxation has remained relatively stable.

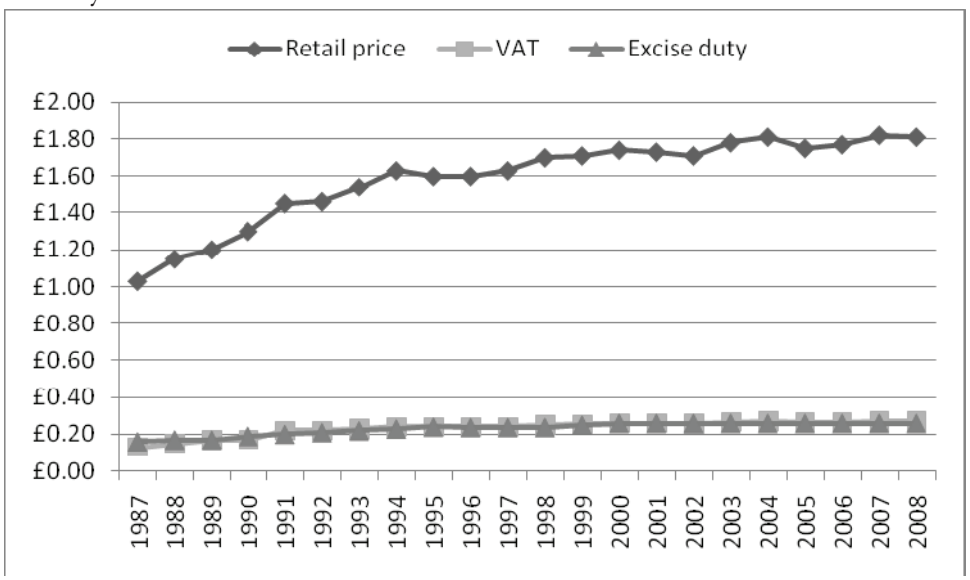

Figure B-7: Taxation and retail prices on a litre bottle of cider, 1987–2008

The steady increases in price with the slight increases in taxation suggest a positive relationship and the plot below illustrates this as well, with a potentially non-linear relationship. The plot suggests with taxation around £0.26, the retail prices have been tested out at a number of levels around £1.80.

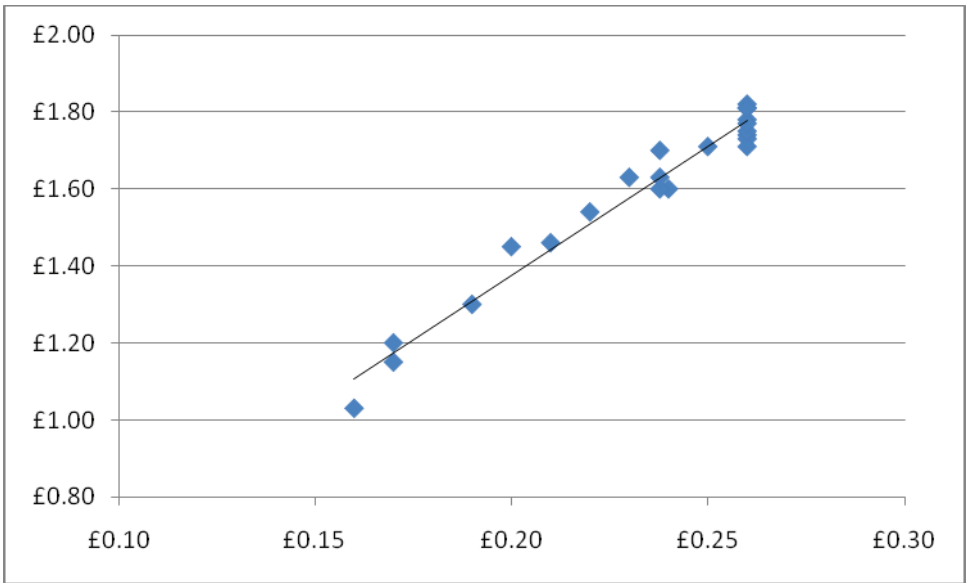

Figure B-8: Relationship between duty and retail prices on a litre bottle of cider, 1987–2008

In terms of the value of the relationship between excise duty and retail price, we identify the slope of the line in the above figure (in terms of percentages). Estimates suggest that a 10 percent increase in real excise duties is associated with an approximately 10 percent increase in the real retail price. This suggests 1-for-1 pass-through of the excise duty rate.

Table B.6: Result of OLS regression for association between excise duty and retail price, cider, 1987–2008

Dependent variable: Log real retail price	
Log real excise duty	1.003***
	(0.0178)
Constant	1.928***
	(0.0194)
Observations	22
R-squared	0.994
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1	

Table and fortified wines

Similar to whisky, in the late 1980s, with little change in VAT or duties there were relatively large increases in retail prices of table wine at retail outlets. However, between 1991 and 2006, table wine prices steadily increased. Also, unlike whisky, recent increases in excise duties with small decreases in VAT were met with decreases in retail prices.

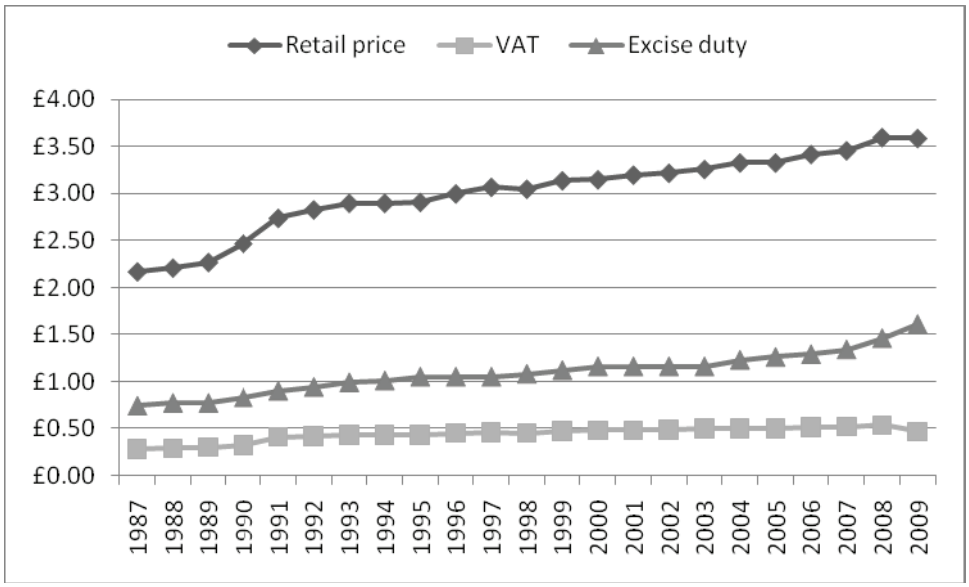

Figure B-9: Taxation and retail prices on table wine from retail outlet, 1987–2009

Source: (HMRC, 2010a)

Despite the reduction in retail prices for increases in duties, the observable relationship over time between retail price and duties suggests that higher excise duties are associated with higher retail prices for table wine. There appears to be a non-linear relationship such that the retail price of table wine levels off with any increase of duty beyond £1.50.

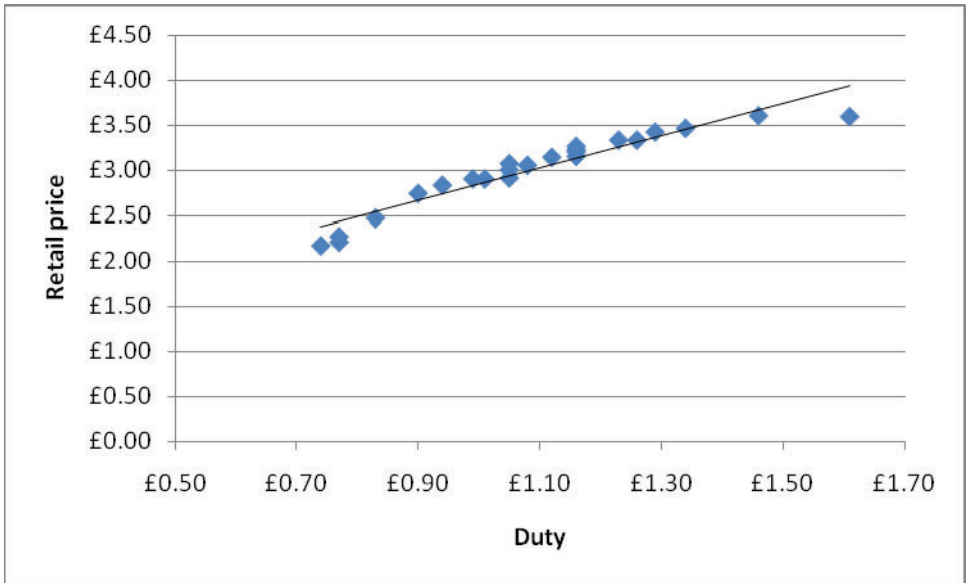

Figure B-14: Relationship between duty and retail prices on table wine from retail outlet, 1987–2009

Source: (HMRC, 2010a)

In terms of the value of the relationship, we identify the slope of the line in the above figure (in terms of percentages). Estimates suggest a 10 percent increase in real excise duties on table wine is associated with an approximately 8.6 percent increase in the real retail price.

Table B.7: Result of OLS regression for association between excise duty and retail price, table wine, 1987–2009

Dependent variable: log real retail price	
Log real excise duty	0.861***
	(0.0215)
Constant	1.096***
	(0.0142)
Observations	23
R-squared	0.987
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1	

Unlike table wine, fortified wine experienced recent increases in price for increases in excise duties and decrease in VAT.

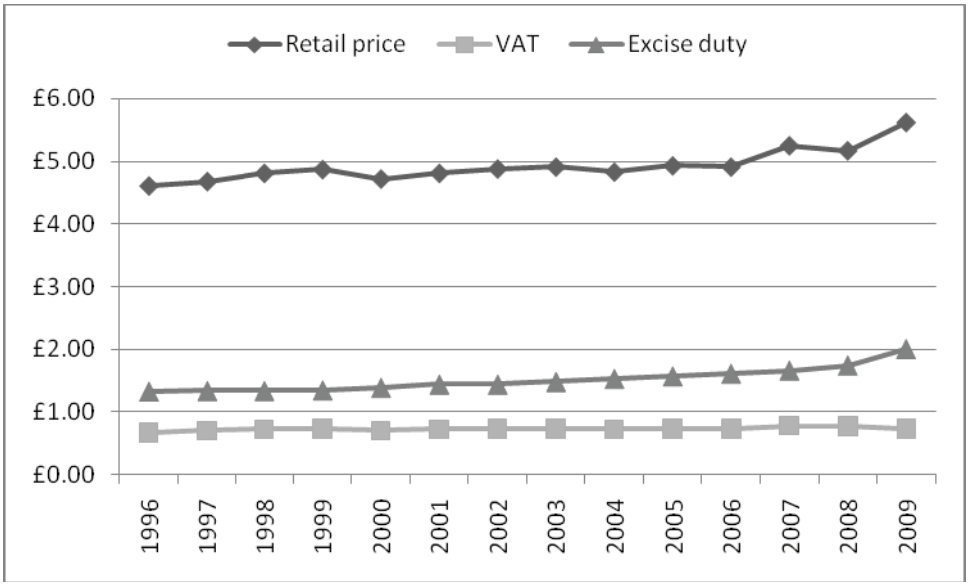

Figure B-15: Taxation and retail prices on fortified wine from retail outlet, 1996–2009

Source: (HMRC, 2010a)

The observable relationship over time between retail price and duties suggests higher excise duties are associated with higher retail prices for fortified wine. Unlike that of table wine, there does not appear to be a levelling off of prices, or a non-linear relationship.

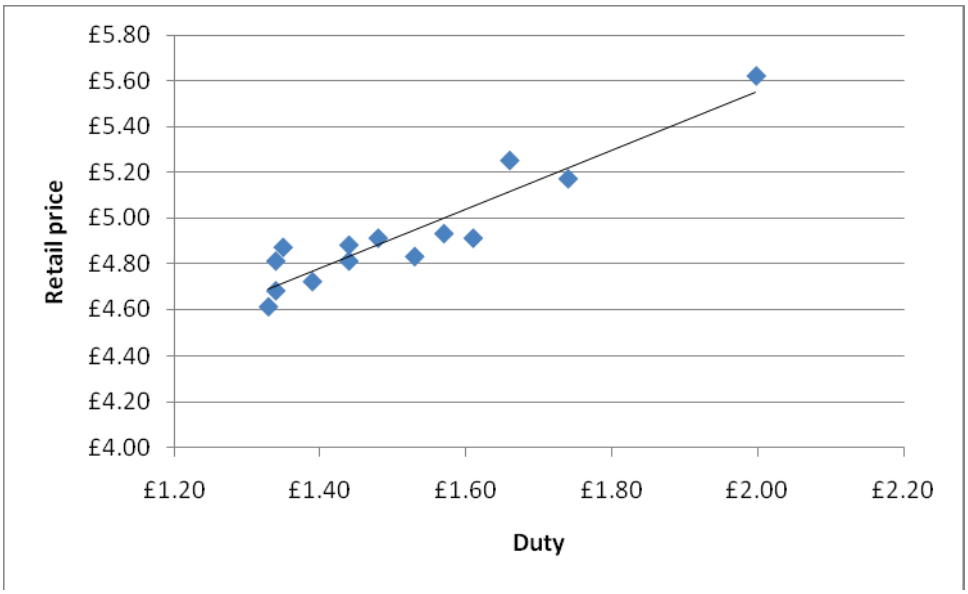

Figure B-16: Relationship between duty and retail prices on fortified wine from retail outlet, 1996–2009

In terms of the value of the relationship between excise duty and retail price, we identify the slope of the line in the above figure (in terms of percentages). Estimates suggest that a 10 percent increase in real excise duties is associated with an approximately 7 percent increase in the real retail price. This is slightly less than that for table wine, which was nearly 9 percent.

Table B.8: Result of OLS regression for association between excise duty and retail price, fortified wine, 1996–2009

Dependent variable: Log real retail price	
Log real excise duty	0.690***
	(0.0275)
Constant	1.496***
	(0.0283)
Observations	14
R-squared	0.981
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1	

Statistics on the consumers

For the interested reader, this section presents further data regarding the affordability of alcohol and the level of consumption (in terms of expenditure and units).

Affordability

Data from the Office for National statistics support the phenomenon of alcohol pricing not moving with incomes between 1997 and 2007. Alcohol became 32 percent more

affordable in 2007 than 1996 (see Figure B-17). In effect, the annual increase in the affordability of alcohol[44] has been 2.6 percent over the period 1997–2007.

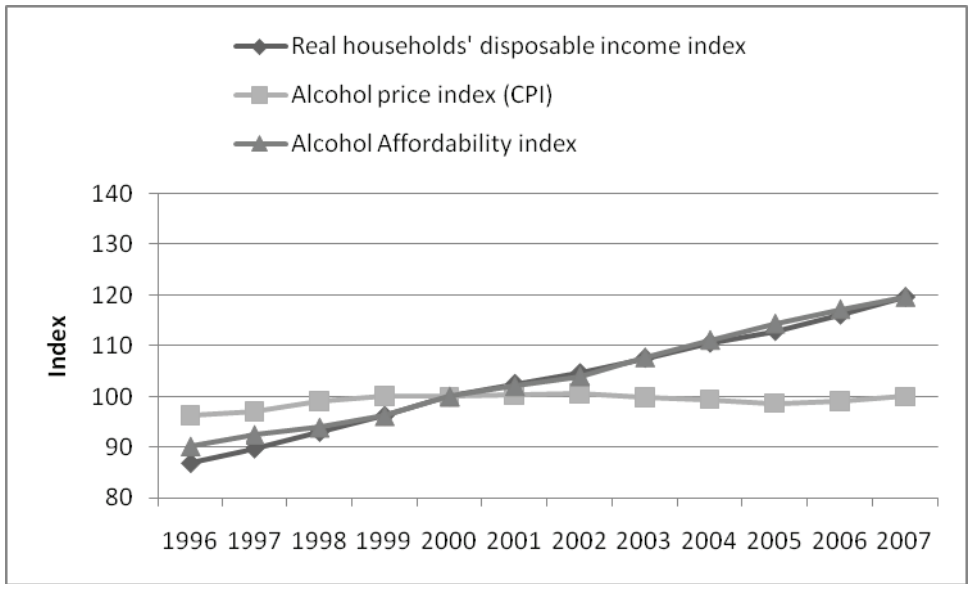

Figure B-17: Affordability of alcohol

Source: Office for National Statistics, 2009. Real households' disposable income- Adjusted to real terms using the expenditure deflator for the household sector.

Consumption of alcohol, in units and expenditure

In total, in 2008, the per capita consumption of pure alcohol was 10.70 litres. This mainly comprised beer and wine.

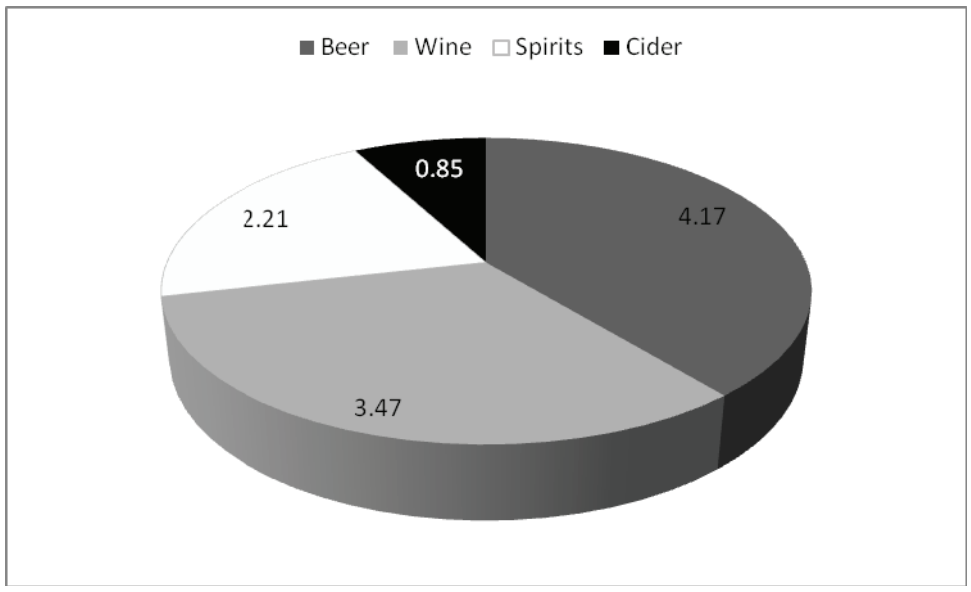

Figure B-18: Litres of pure alcohol consumed per annum per capita (adults only), 2008

Source: (HMRC, 2010a)

[44] Alcohol affordability = (Real households' disposable income index / Alcohol price index) * 100

In terms of how much is actually spent on each alcohol type, the most money is spent on beer/lager/ciders/perry, followed by wines, and then spirits and liqueurs.

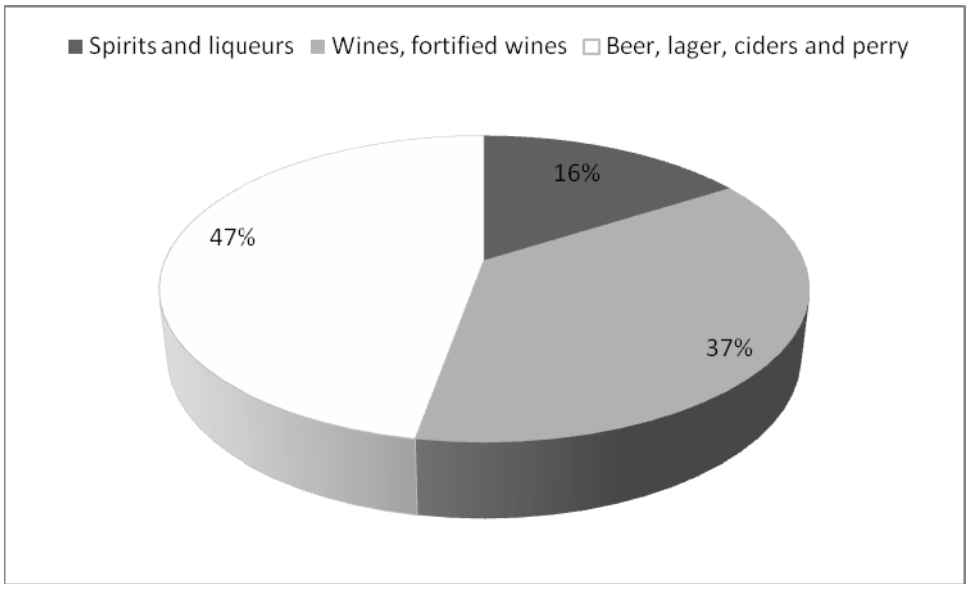

Figure B-19: Household alcohol weekly expenditure, by drink type, 2008

Source: (ONS, 2009)

As to where people spend their money on alcohol, people buy certain drinks at certain locations. As seen in Table B.9, in the off-licence, people spend most of their money on wines/fortified wines. On the other hand, at on-licenced premises, people spend more on beer/lager/ciders/perry.

Table B.9: Proportion of expenditure on particular drink types, by location

	On-licence	Off-licence (including supermarket chains)
Spirits and liqueurs	11.11%	19.05%
Wines, fortified wines	18.06%	52.38%
Champagne and sparkling wines	1.39%	-
Beer, lager, ciders and perry	58.33%	26.98%
Alcopops	1.39%	1.59%
Round of drinks	9.72%	-
Total	100.00%	100.00%

Source: (ONS, 2009)

Binge drinking

The proportion of people reporting they drank more than 14(women)/21(men) units has declined from 1998 to 2005.

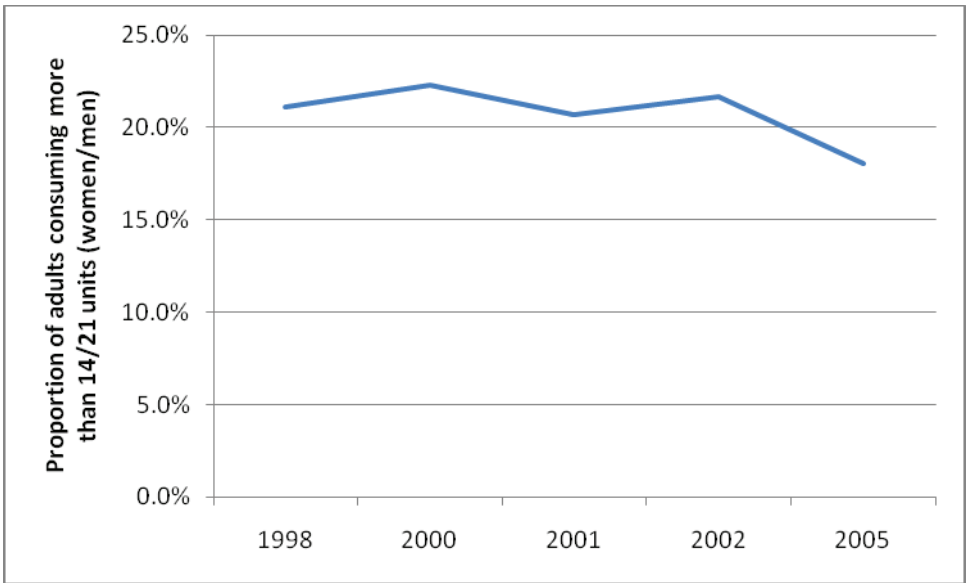

Figure B-10: Proportion of adults reporting binge drinking, 1998–2005

Source: General Household Survey 2005, Office for National Statistics (ONS)

Appendix C: Interview Protocol

This Appendix outlines the topics for our interviews. This questionnaire was designed to both capture thoughts on possible future outcomes resulting from alcohol pricing policy options and to shed light on the specific relationship between retailers and producers of alcohol in the UK.

1. Industry

In this first section, we are asking questions about likely responses of industry to the alcohol pricing policies.

- Regarding each policy measure:
    - Do you have ideas about the reactions of the alcohol industry in terms of marketing and branding?
    - Do you think the alcohol industry would alter the number or range of products offered (that is, eliminate certain brands)?
    - How might product differentiation occur?
    - What is likely to be driving industry response (for example market structure, production differentiation pressures, market share, etc)?
- How are the alcohol industry's current marketing strategies a consequence of government regulation?

2. Retailers

This section asks about the retailers' response in terms of their consumer and supplier relationships.

- An issue raised with minimum pricing and below-cost sales options is that supermarkets and off-licence premises will move to sell other products as their low-cost leaders. In your experience, is this a likely strategy for retailers?
- If the minimum price is at a level such that retailers' 'own brands' are relatively more affected and fall below the pricing ban and/or were to be sold below cost:
    - What are the likely/possible marketing strategies for retailers to gain/maintain profits that you would expect?
    - Would own-brands cease to exist?
        - If not, how might the alcohol shelf look?

- How are current marketing strategies of retailers a consequence of government regulation?

3. Government

In this section we want to learn what role government regulation has and could have in the alcohol market.

- Do you think there could be any unintended consequences for government from the three pricing options (namely losses in tax revenue due to growth of black/grey market, marketing of higher strength alcohol, etc)?

4. Further information

- Is there any further information available to you that might be relevant to the issues discussed in this interview?
- Would you recommend anyone else to talk to us about the potential economic implications of alcohol pricing policy options?