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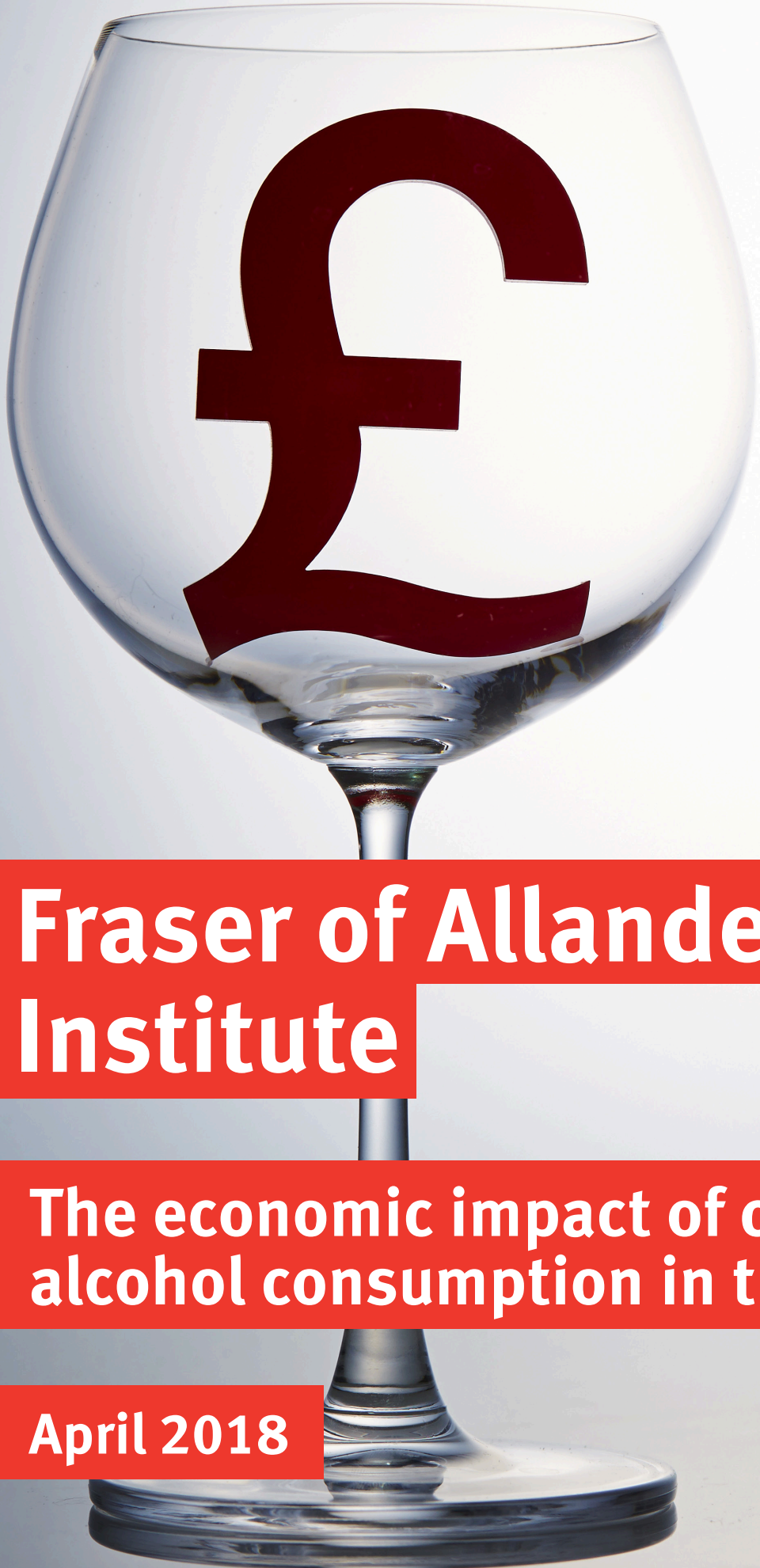

Fraser of Allander Institute

The economic impact of changes in alcohol consumption in the UK

April 2018

Executive Summary

The economic impact of changes in alcohol consumption in the UK

The alcohol industry (both manufacturing and sales) is important to the UK Economy as it supports thousands of jobs (IAS, 2017a; Oxford Economics, 2016). However, there are many well documented adverse effects of high alcohol consumption, most notably on public health. With the UK having one of the highest alcohol consumption rates in the world, recent Government policy has sought to address some of this harm. Changes in policy and social attitudes may result in changes in UK alcohol consumption. The focus of this report is to examine the potential macroeconomic impact from changes in UK alcohol consumption. Previous studies (WTSA, 2013) have investigated the gross impacts resulting from changes in consumption – that is, the impact of the alcohol sector without considering reallocation of spending to other goods and services. This report extends the literature and investigates the net impacts by including the redistribution of both household and government income.

This report uses Input-Output (IO) methodology (with disaggregated alcohol sales sectors), which allows for a range of scenarios to be modelled, including:

- A reduction in alcohol consumption without reallocation of saved income. This corresponds broadly to the standard IO analysis of a sector's economic gross impact.
- A shift in tastes away from alcohol consumption and in favour of other goods. In the first scenario, to isolate the impact, the assumption is made that households save all of the income that would otherwise have been spent on alcohol. However, this is highly unlikely and, in practice, it would be expected that households would spend the income on other goods and services. In this report, several reallocations of spending are carried out to estimate the net impact of the reduction in alcohol consumption.
- A shift in tastes away from on-trade to off-trade consumption. In addition to an overall reduction in consumption, recent trends indicate an increase in off-trade sales coupled with a decrease in on-trade sales.
- Introduction of higher alcohol duty with and without the spending of additional government revenues.

Analysing the results of these scenarios we can reach several conclusions:

1. The economic effects of a reduction in alcohol consumption without reallocation of saved income to other goods and services is – as would be expected – strictly negative. A 10% reduction in alcohol sales results in a GVA (Gross Value Added) fall of £2.6 billion and a loss in employment of 63,300 FTEs (full-time equivalent jobs).

2. The impact of a shift in tastes away from alcohol, with household spending reallocated to other goods and services is ambiguous and dependent upon the industries to which spending is reallocated. With a 10% reduction in spending on alcohol, and depending on which sectors absorb additional demand, GVA impact ranges between £1025 million and -£1711 million, and employment impact ranges between 49,500 FTEs and -54,500 FTEs. These are the high and low bounds on the GVA and employment effects, but in a more plausible set of scenarios in general we observe a positive GVA impact and a negative employment impact, i.e. fewer but better paying and more GVA-intensive jobs. This is not surprising as alcohol sales (in general) are relatively less GVA-intensive, but more labour-intensive sectors.

3. A shift in tastes towards off-trade sales and away from on-trade – a trend apparent in recent data - has an overall negative effect, as households are effectively spending less due to off-trade alcohol being cheaper than on-trade. If 10% of alcohol sales by volume are shifted from on-trade to off-trade the result is a reduction in GVA of £1.5 billion and a loss in employment of 40,270 FTEs. These results are lower than a simple 10% reduction in consumption but are still very substantial, demonstrating that the on-trade sector is much more GVA and labour intensive than the off-trade.

4. An increase in the UK alcohol duty rates, without the recycling of additional tax revenues, leads to a reduction in alcohol consumption due to higher alcohol prices without other effects, similar to the first scenario. A 10% increase in the alcohol duty results in a reduction in both GVA of £294 million and employment of 7,320 FTEs. However, if the government spends additional revenues from higher tax, following the pattern of their base-year spending, then the net economic impact of higher alcohol tax becomes positive with an increase in GVA of £847 million and a gain of 17,040 FTEs. This suggests that such a policy could possibly simultaneously reduce alcohol consumption, with attendant health benefits, and stimulate economic activity: a kind of "double dividend".

This report expands on standard IO impact analysis by incorporating changes in tastes, reallocation of consumption and investigating the impact of government policy. However, there are many economic effects that this analysis cannot take into account due to the limitation of the IO framework. Future research should explore the impact of relaxing some of the assumptions, particularly input-output's assumption of an entirely passive supply side (i.e., no supply constraints and as a consequence, fixed prices). In addition, further research into the negative economic impact of alcohol consumption's harmful health effects (e.g. sickness, absenteeism, unemployment etc.) is necessary, but beyond the scope of this report.

Disclaimer

This report has been conducted by the Fraser of Allander Institute (FAI). The FAI is Scotland's leading independent academic research institute.

The research was funded by the Institute of Alcohol Studies (IAS). IAS determined the specific research question to be analysed. FAI received no guidance on the project or report.

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Introduction

Chapter 1

1.1 Introduction

The UK has one of the highest alcohol consumption rates per capita in the world – ranked 25th according to the latest global report on alcohol by the World Health Organisation (WHO, 2014). While there are several well documented detrimental effects of alcohol consumption on health, crime and productivity (Holmes et al, 2016), the sector also contributes positively to the UK economy through its production and sales activities. The sector supports 770,000 jobs (IAS, 2017a) - and generates substantial revenues for the UK Treasury, with more than £11.15 billion raised through alcohol duty alone in the 2016/17 financial year (HMRC, 2017). Any overall assessment of the economic impact of the alcohol industry would have to take account of all the costs associated with the adverse effects of alcohol consumption (including absenteeism and presenteeism). However, a comprehensive cost benefit analysis is beyond the scope of the present analysis. Rather, in this study we seek to provide the best possible estimates of the sector's impact on the UK economy through its expenditures on labour services and material inputs. We explore (through an application of input-output analysis) the economy-wide impacts of a reduction in UK alcohol consumption (through sales), which occurs either through a change in tastes or through an increase in alcohol tax.

Input-Output (IO) analysis has previously been used in conventional impact studies to estimate the output and employment supported by the UK alcohol industry (Oxford Economics, 2016; Berkhout et al, 2013). In our model we take a different approach by investigating the impact of changes in the spending on alcohol. Instead of only investigating the gross impacts of changes in consumption (WSTA, 2013) we account for the net impacts by assuming that households will use the money saved from lower alcohol consumption to purchase other goods and services.

The report is organised as follows: Section 2 provides background to the study. Section 3 then outlines the input-output methodology used to measure the economic impacts of a change in alcohol consumption along with the simulation strategy. In Section 4 the results are presented and discussed. Section 5 provides a brief conclusion.

Background

Chapter 2

2.1 UK alcohol policy

As in many countries the legal age for purchases of alcohol in the UK is 18, whereas the legal age for consumption depends on a variety of factors, including location and type of alcohol. While there are no other legal limits on the purchase or consumption of alcohol the UK government recommends that both men and woman should not regularly consume more than 14 units per week[1]. (Department of Health, 2016).

In the past the UK Government has set out policies with the objective of reducing the rate of alcohol consumption, in particular, harmful consumption. Implemented in 2012, the UK Alcohol Strategy (UK Government, 2012) was the most significant recent alcohol policy, with the objective of reducing alcohol consumption through a series of actions.

One problem identified by the UK Government was the availability of cheap alcohol. To combat this problem the UK Alcohol Strategy outlined actions aimed at reducing consumption including: introduction of a minimum juice content rule in cider, increase of the duty on high strength beer (›7.5%) together with reduction of the duty on lower strength beer (‹2.9%). The UK strategy also mentioned the possibility of banning the multi-buy sales discounts (buy one get one free) and the introduction of a minimum unit price but they were not implemented at the UK level. However, both of these measures were implemented in Scotland (Scottish Government, 2017), where alcohol consumption is around 18% higher than in England and Wales[2].

Along with multi-buy deals, the UK Government identified alcohol advertising as a potential factor limiting reduction in consumption, especially among the young (18-24). The idea of a ban on advertising was mooted, but not adopted as the Government noted that there were already strict advertising controls in place to prevent advertisers from targeting and appealing to the young (UK Government, 2012).

The UK Government has also set out other alcohol-focused policies. Launched in 2011, the Public Responsibility Deal was an agreement between the Government and industry, public bodies, NGOs and academics to promote public health goals. It included 11 pledges related to alcohol ranging from alcohol labelling to support for the Drinkaware charity (IAS, 2015). With this being a voluntary agreement there was, however, a possibility of conflict of interest in the alcohol industry with regard to public health.

The UK government also sets the alcohol duty level which affects the cost of alcohol and so the level of consumption. To induce a reduction in consumption, between 2008 and 2012, the alcohol duty escalator (ADE) was in place, which increased alcohol duty 2% above the rate of inflation on an annual basis. However, by 2014 the ADE had been scrapped (2013 for beer) and in 2015 and 2016 duty rates were frozen (IAS, 2017b). Duty rates in 2017 rose with inflation but again have been frozen for 2018. Overall, there has been a significant drop in alcohol duty in real terms since 2012.

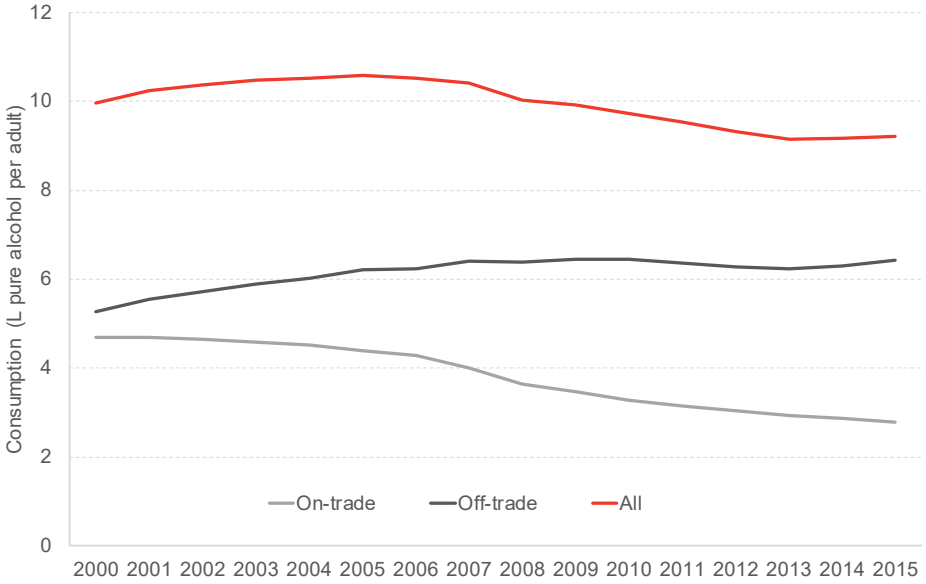
2.2 Alcohol consumption trends

In this section we provide a descriptive analysis of the consumption of alcohol in the UK. Since the turn of the century there have been several noticeable changes. The overall consumption of pure alcohol by volume is shown in Chart 1 below.

[1] A unit of alcohol is defined in the UK as 10ml (or 8g) of pure alcohol (NHS, 2018).

[2] The key elements of Scottish alcohol policy are no multi-buy promotions (implemented in 2012) and the introduction of a minimum unit price of 50p to be enforced from the 1st May 2018.

Chart 1: Total volume of pure alcohol (L) sold per adult in UK.

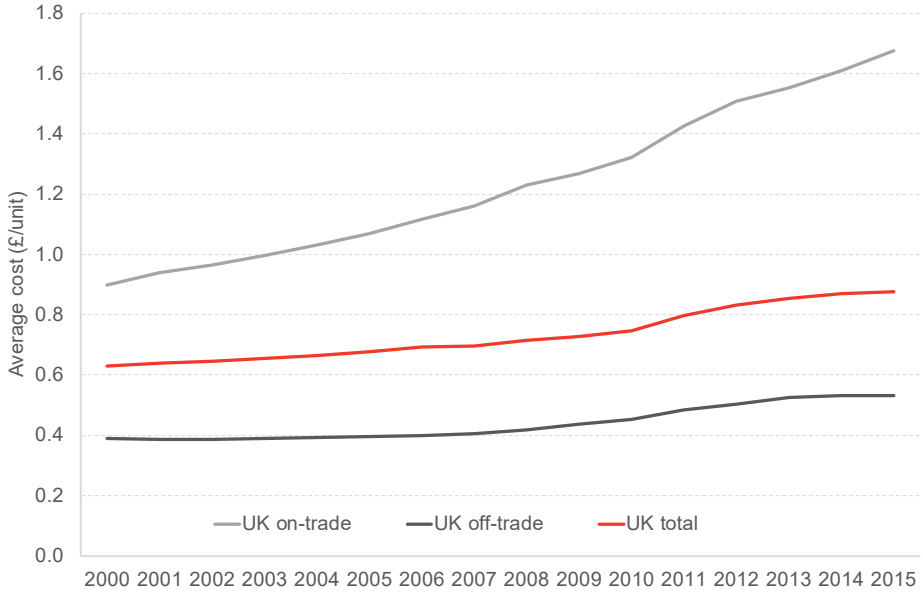


Source: MESAS (2017)

Between 2000 and 2015 there has been a reduction in the consumption of alcohol from 10.0L per adult per year to 9.2L[3]. Initially there was a steady increase in consumption until 2005 to 10.6L per adult, followed by an eight-year period of continuous reductions. An interesting point to note from Chart 1 is the reduction in consumption between 2007 and 2008 of 3.8%, which is much larger than other year on year reductions (all less than 2.5%). This indicates that alcohol consumption is sensitive to household spending power, which declined due to the financial crises of 2008.

The total sales in Chart 1 do not tell the full story of alcohol consumption. The sales from the on-trade (bars, pubs, restaurants) and the off-trade (supermarkets, off-licenses) have diverged in recent years. People have shifted their consumption from the on-trade to the off-trade. In the 15 years between 2000 and 2015 on-trade consumption declined by 40.81%, while off-trade consumption rose by 22.05%.

Chart 2: Average cost of unit of alcohol in UK.



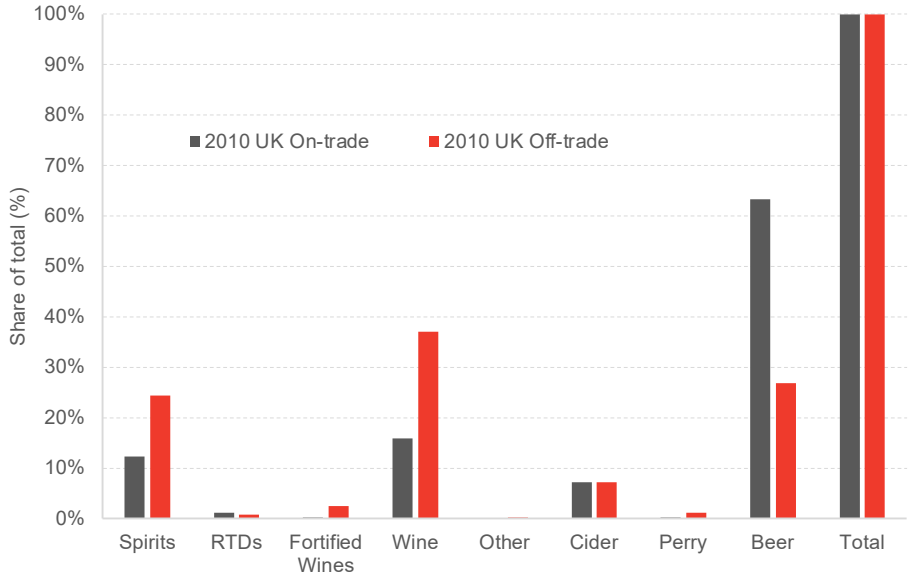
Source: MESAS (2017)

[3] While there has been a decrease in consumption since the turn of the century, it should be noted that the consumption level in 2000 was relatively high compared with historic levels (IAS, 2018).

This shift from on-trade to off-trade consumption can be attributed to three main factors: the price of alcohol, social change and drink driving limits. Chart 2 demonstrates that there is a significant and widening differential in the price of alcohol between on-trade and off-trade. On-trade prices have exhibited a significant increase rising by over 80% over the 15-year period. Year on year, the average increase was 4.25% - outstripping UK inflation (ONS, 2018). There have been several studies investigating the price elasticities of the demand for alcohol (Collis et al, 2010; Meng et al, 2013), which find high negative price elasticities, indicating that consumption is sensitive to relative prices. The rise in the on-trade price has, therefore, led to a squeeze on the on-trade industry, with many premises closing during the last 15 years (BBPA, 2017). The off-trade also experienced a rise in the price of alcohol but of a much lower magnitude – with an overall increase of 36.3% over the 15-year period.

Chart 3 reports the sales of alcohol by type and distribution channel. By far the most common type of alcohol sold through the on-trade is beer with more than 63% of the sales by volume. Wine is the second largest followed by spirits and cider. Wine is the largest consumed alcohol in the off-trade (37.1%) followed by beer and spirits with 26.8% and 24.5% respectively.

Chart 3: Distribution of sales by type (by volume).



Source: MESAS (2017)

2.3 Health and societal effects of alcohol consumption

Many studies have investigated the relationship between alcohol consumption and a range of detrimental health effects (e.g. Corrao et al, 2004; Ridolfo and Stevenson, 2001). These health effects include increased risk of several types of cancer, cardiovascular disease, liver disease, high blood pressure, dementia and depression.

As well as harmful health effects to an individual, there is a societal cost of excess alcohol consumption (Jarl et al, 2017). Adverse health effects of excess alcohol consumption lead to an overall increase in health care costs, for which society pays through higher taxes (Leicester, 2011). Increased policing and rehabilitation services also vary directly with excess alcohol consumption; there is a well-documented link between alcohol consumption and violent crimes – with 53% of violent crime incidents in the UK involving alcohol (ONS, 2015). Other societal costs incurred through excess alcohol consumption are: reduced productivity through absenteeism and presenteeism[4]; property damage and increased social care costs.

Alcohol within the UK is one of the highest taxed commodities with two different taxes levied: an alcohol duty as well as the standard 20% rate of VAT. As identified above, the rationale behind this extra alcohol duty is to cover the societal costs associated with alcohol consumption. There is no 'one size fits all' policy, however, with the alcohol duty level dependent on the type, strength and quantity of alcohol[5].

In this report these societal costs are acknowledged, but are not included in the analysis, which focuses solely on consumption and the links to other sectors within the economy.

2.4 Economy wide effects

The sale of alcohol not only affects the industries directly involved in its production and distribution but also other sectors of the economy; this is explained further in the input-output (IO) methodology section. There have been several industry-funded studies which investigate the economy-wide impacts of the alcohol industry, both internationally and in the UK. These conventional "impact studies" seek to identify the output and employment supported by the alcohol industry.

Oxford Economics (2016) analyse the beer and pub sector (including manufacturing) within the UK and find that nearly 900,000 jobs[6] are sustained through the sector with £23.1 billion contributed to national GVA. The authors also estimate the regional impacts of the beer and pub sector.

Berkhout et al (2013) study the contribution of beer brewing to the economy of each of the 28 EU member states between 2008 and 2012. They use an IO methodology. For the UK they used BBPA data and results of a series of questionnaires sent to the UK brewing companies. The authors found that over this period there was a steady decrease in the number of jobs supported by the beer sector (from 397,900 to 321,900). Also during this time there were reductions in contributions to both GVA and Government revenues of 14% and 2.8%) respectively.

In Wine and Spirit Trade Association (WTSA) report (2013) the authors use an IO framework to measure the contributions of the wine and spirit sector within the UK and report an estimated employment impact of 474,993 jobs. The authors also use the framework to build an IO model (similar to the one we use) to measure the economic impacts of the alcohol duty escalator. They run several scenarios to determine the economic consequences of varying the length of the ADE, which will reduce alcohol consumption. The focus is on the gross impacts from the reduction of alcohol sales.

[4] Presenteeism is the reporting to work and performing sub-optimally due to alcohol use (Aas et al, 2017).

[5] For details see https://www.gov.uk/government/publications/rates-and-allowance-excise-duty-alcohol-duty/alcohol-duty-rates-from-24-march-2014.

[6] These numbers differ from that found in IAS (2017a) as different methodologies are used.

Such impact studies are a conventional way to perform IO analysis and show gross impact of an industry on the economy. To add an extra dimension to the analysis of multidimensional effects of the alcohol industry on the economy, in this report – as is explained in detail in section 4 – we not only investigate gross impacts of alcohol consumption but also the net impacts through the reallocation of spending and impacts from government policy.

Methodology

Chapter 3

The aim of this project is to investigate the economy-wide impacts of a reduction in alcohol consumption – either due to a change in tastes or because of an increase in alcohol taxation. To determine these impacts, we develop and apply an alcohol-disaggregated IO model of the UK.

3.1 Input – Output (IO) modelling outline

IO tables are a set of economic accounts used to provide a complete picture of an economy over a set period of time (usually a year). Generated through the use of surveys and other data the IO tables contain information on the value of inter-industrial (based on SIC classification) transactions in the economy. In these tables the rows represent the sectoral sales, while the columns represent the purchases. As well as intermediate sales and purchases, these tables contain information on exports, imports, wages, taxes etc. A key feature of these IO tables is that they must balance, i.e. the total sales of a sector equal the total purchases.

An IO model can be calibrated on the IO database. This captures the linkages between each sector within the economy using a set of linear equations. The system can be solved to determine the economic impact of any exogenous demand shock, given certain assumptions about the nature of the economy (in particular, the passive nature of supply).

The IO model identifies the impact of demand changes on a wide range of variables, including the aggregate and sectoral levels of GVA, output, and employment. There are three different types of impacts – direct, indirect and induced. Direct effects measure the changes in the industries directly impacted by changes in demand (e.g., if the demand for whisky from UK manufactures increases by £10 million, then the output of this industry needs to increase by the same amount to meet demand). However, these industries are themselves linked to others in the economy through intermediate purchases so that any change in the initially impacted industries drives changes in the others (to meet the increase in whisky demand the manufactures will rely on inputs from other industries (e.g. agriculture) thus increasing their demand). These are the indirect effects. Type I multipliers in IO models reflect the total direct and indirect effects generated per unit of final demand.

Induced effects occur where household consumption demand is made endogenous within the model, and is linked to household income. Changes in employment alter household incomes and therefore consumption (distilleries and agriculture sector will increase employment to meet increased demand, thus there is a higher level of national income – although wages do not change). The increase in consumption stimulates the demand for all goods and services. The Type II multipliers capture all the induced effects, as well as the direct and indirect effects. The fixed-price IO framework assumes that wage rates are unchanged; the induced effects occur through the increase in employment thus labour income and higher household spending power.

For this report an IO model was calibrated using a purpose-built 2010 UK alcohol-disaggregated IO table. Within the alcohol industry we identify two key components, production and consumption. In this paper the focus is on consumption changes and within the alcohol disaggregated IO table there are three consumption sectors – hotels, other on-trade (including pubs/bars/restaurants/nightclubs etc.) and retail (off-trade). In Appendix A there is further explanation of the principles of IO modelling. Appendix B details the development of the alcohol-disaggregated IO table.

While IO modelling has been extensively used for economic impact assessment, the framework is based on a number of fundamental assumption. Key to IO modelling is the assumption of a passive supply with fixed prices. With this assumption extra demand is always met by increased production without putting upward pressure on prices or wages, implying the supply-side does not react to changes in demand.

3.2 Simulation strategy

Several scenarios were explored in the alcohol-disaggregated IO model to investigate the economy-wide effects of a change in alcohol consumption. In this section these simulations are explained with details provided on the motivation for the simulations and on how they were carried out.

In addition to the macroeconomic impacts, we explore the scale of the revenue lost to the UK Treasury (through alcohol duty and VAT) due to the reduction in sales of alcohol in Scenarios 1-3. VAT is taken to be 20% of the sales value while the duty calculation uses information of duty rates by type of alcohol from HRMC (2012).

Scenario 1 – 10% reduction in consumption across all three alcohol sectors with no change in other spending.

In the introduction we noted the emphasis on the reduction of alcohol consumption in the UK government's alcohol strategy. While this strategy identified the steps undertaken to reduce the consumption of alcohol, there was no clear target reduction specified. However, the World Health Organisation (WHO) recommends an overall 10% reduction in alcohol consumption to reduce health effects (WHO, 2018). For the first scenario we explore the impact of a 10% reduction in alcohol consumption in the UK. While this is purely illustrative, the linearity of the IO model makes it straightforward to extrapolate these results to alternative scenarios.

For this scenario it is assumed that all three consumption sectors (hotels, other on-trade and retail) experience a 10% reduction in the value of alcohol sold with the price of alcohol fixed. We investigate the economy-wide impacts of such decline in alcohol consumption, perhaps as a result of the success of government advertising in changing consumer tastes.

In this scenario it is important to note that the income saved as a consequence of the reduction in alcohol spending is not reallocated to other consumption. Scenario 1 isolates the effects of only reducing alcohol consumption. This is broadly the approach used in general by sectoral "impact studies" that seek to identify the overall impact of a particular sector. (Of course, in general, a switch in tastes away from alcohol will operate in favour of the consumption of other goods. Scenario 3 deals with the possible reallocation of spending throughout the economy.)

Scenario 2 – 10% shift from on-trade to off-trade.

The MESAS (2017) consumption data discussed in Section 2 reveals that, since the turn of the century there has been a clear shift in 'tastes' away from on-trade and in favour of off-trade consumption. In this scenario we model a 10% reduction in the on-trade sales value being matched by an increase in the off-trade alcohol sales. We also account for the fact that the cost of alcohol in off-trade is on average cheaper than in on-trade. To do this we calculate the volume (hl) of alcohol a 10% reduction in on-trade sales value accounts for, then calculate the value of this volume for the off-trade sector[7].

Scenario 3 – Scenario 1 plus reallocation of spending based on IO table spending pattern.

Scenario 1 investigates the effects of an overall 10% decrease in alcohol consumption with no reallocation in spending. However, if households and tourists do not spend as much on alcohol it is likely they would switch their spending to other products and services, rather than saving it (as in Scenario 1). This is accounted for in scenario 3 by using information from the IO tables to determine the distribution of spending reallocated from alcohol consumption. This reallocation follows the pattern of household expenditure in the original IO table.

Using the income saved from reduced consumption expenditure on alcohol to spend on other goods clearly reduces the scale of the negative impact on the economy. Indeed, ex ante, even the direction of change in aggregate economic activity is strictly ambiguous: depending on the structure of the alcohol-related industries relative to all other industries it is perfectly possible that the switch in consumption away from alcohol would actually increase aggregate economic activity.

[7] MESAS (2017) also provides information on the average cost of the different types of alcohol through both the on- and off-trade. We use this information to convert the value of on-trade alcohol to off-trade while maintaining the same volume.

This reallocation of consumption is also more favourable to the UK Treasury compared with Scenario 1 as more tax is paid because of the increase in the consumption of non-alcohol goods and services. So the loss of tax revenues is less than under Scenario 1[8].

Scenario 4 – Sensitivity analysis around scenario 3 .

The previous scenario investigates the impact of households reallocating the savings from a reduction of spending on alcohol to other industries within the economy using pattern of household expenditure in the original IO table. In this scenario we explore the reallocation of spending resulting from a 10% reduction in the consumption of alcohol in more detail. In particular, instead of being based on information from the IO table, we assume that reallocated spending is more narrowly targeted at the following groups of industries:

- Groceries;
- Leisure;
- Groceries and Leisure.

These sectors were chosen for reallocation as they were identified to be the most plausible recipients of the reallocation of spending. As households spend less on alcohol they are likely to spend more on these other products, rather than simply add to their savings (Scenario 1) or allocate their spending equi-proportionately to the base year spend (Scenario 3).

Also in this scenario we identify the minimum and maximum GVA and employment impact limits that could be associated with the reallocation of spending following a shift in tastes away from alcohol. We note that the GVA (employment) impacts are highly sensitive to the assumptions of sectoral reallocation and as such it is advantageous to know both the maximum and minimum limits of GVA (employment) impacts. For this purpose, first the GVA (employment) multipliers for each of the industries in the alcohol disaggregated IO table are determined. The lower GVA (employment) limit is then calculated by assuming that all household savings from the reduction in alcohol consumption are reallocated to expenditure on the industry with the lowest GVA (employment) multiplier, while the higher limit is determined by assuming the reallocation is to the industry with the highest GVA (employment) multiplier.

Scenario 5 – 10% increase in alcohol duty.

The UK alcohol strategy (UK Government, 2012) identified the low price of alcohol as problematic, since the lower price drives an increase in consumption as found in Meng et al (2014)[9], which can, as already noted, lead to various adverse health effects. Thus the simplest method to reduce consumption is to increase the price – either through a tax or minimum unit pricing (MUP). While there is evidence that MUP could lead to a reduction in 'health inequality' (Holmes et al, 2010), there has been substantial objection towards these policies[10]. In time MUP may become a UK-wide policy. However, the most likely increase in alcohol prices in the short term will be from an increase in tax – the focus of this scenario.

[8] The standard VAT rate of 20% was used for all sectors.

[9] Based on 112 studies, Wagennar (2009) et al gives a meta-analysis of alcohol price and tax level on consumption.

[10] One of the key opponents to this minimum pricing is the Scottish Whisky industry. https://www.theguardian.com/society/2017/jul/24/scotch-whisky-industry-attacks-minimum-price-plans-as-blunt-instrument; http://www.bbc.co.uk/news/uk-scotland-38390535

As identified in Section 2.3, there is no 'one size fits all' alcohol tax in the UK. Instead the tax levied is dependent on the type of alcohol. In this scenario we assume a broad 10% increase in the tax duty on all types of alcohol. An important point that needs to be accounted for is the consumption response to a change in price for each type of alcohol. For this the own-price elasticises from Meng at al (2014) listed in Table 1 were used. Most elasticities are between 0 and -1, indicating that as the price rises demand falls, but less than in proportion to the fall in price so that the total expenditure on alcohol increases. Accordingly, with most of the elasticities less than unity, demand falls less than in proportion to the rise in price, so that Government revenues will actually increase.

Table 1: Own price elasticity by type of alcohol.

	On-trade	Off-trade
Beer	-0.79	-0.98
Cider	-0.59	-1.27
Wine	-0.87	-0.38
Spirits	-0.89	-0.08
RTDs	-0.19	-0.59

Source: Meng et al (2014)[11]

Scenario 6 – 10% increase in alcohol duty plus recycling of tax revenues

Scenario 6 replicates Scenario 5, but now assumes that the increase in tax revenues is used to fund increased general government expenditure. It is assumed that the allocation of additional tax revenues is based on the pattern of government expenditure that is in the original IO table.

[11] Collis et al (2010) also produce own-price elasticise, found in Appendix C. Meng et al (2014) where used in the modelling as they are the most up to date estimations.

Results and discussion

Chapter 4

4.1 Scenario 1 – The impacts of a 10% reduction in alcohol consumption

Table 2 details the overall effects of a 10% reduction in sales by value though all three alcohol sales sectors (accommodation, other on-trade and retail). As expected with this reduction (and no reallocation of spending) the effect on output (the total value of the sales of goods and services), GVA (the value of final goods and services, i.e. accounting for intermediate consumption, taxes etc.)[12] and employment is negative. Overall there is a reduction in GVA of £2.60 billion. This is broadly consistent with the Oxford Economics' (2009) report, which stated that the alcohol industry in 2008, overall, supported £28.6 billion of UK GDP. For employment, a 10% reduction sees the loss of 63,344 full time equivalent jobs (FTEs) – with nearly 55% of these directly in the alcohol sales sectors (34,779) and 1,200 in manufacturing of alcohol (5.3% of base year). IAS (2017) notes that in 2014 the UK alcohol sales industry supported 740,000 UK jobs[13], with only between 30-56% (depending on sector) being full-time. Again, our results look to be of the appropriate order of magnitude given a 10% reduction[14].

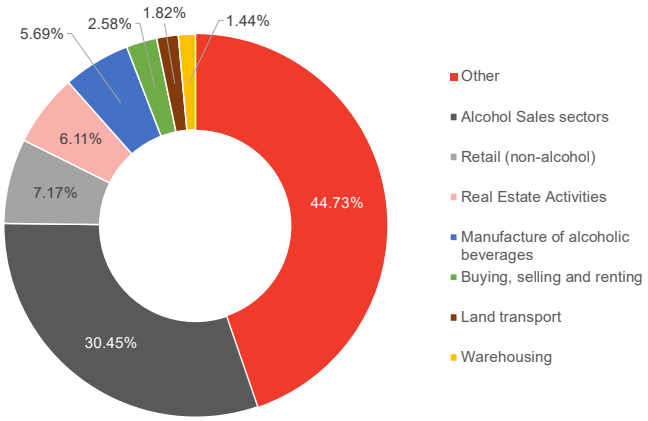
Table 2: Impacts on output, value-added and employment.

	Direct	Indirect	Induced	Total
Output (£million)	-2,041	-1,717	-3,531	-7,288
Output (%Change)	-0.08%	-0.06%	-0.13%	-0.27%
GVA (£million)	-797	-752	-1,030	-2,579
GVA (%Change)	-0.06%	-0.06%	-0.08%	-0.19%
FTE (person years)	-34,779	-11,850	-16,716	-63,344
FTE (%Change)	-0.14%	-0.05%	-0.07%	-0.25%

Source: Fraser of Allander Institute

Obviously the reduction in GVA is not evenly distributed throughout the economy. Its distribution depends on the sectoral GVA and inter-sectoral links with alcohol sales sectors. Chart 4 demonstrates the sectoral distribution of the overall GVA change. The largest GVA reduction is – as expected due to the large change in output – in the alcohol sales sectors. The other significant GVA contributions are the sectors which are inherently linked to the sales of alcohol but are not directly stimulated.

Chart 4: Sectoral composition of GVA change.



Source: Fraser of Allander Institute

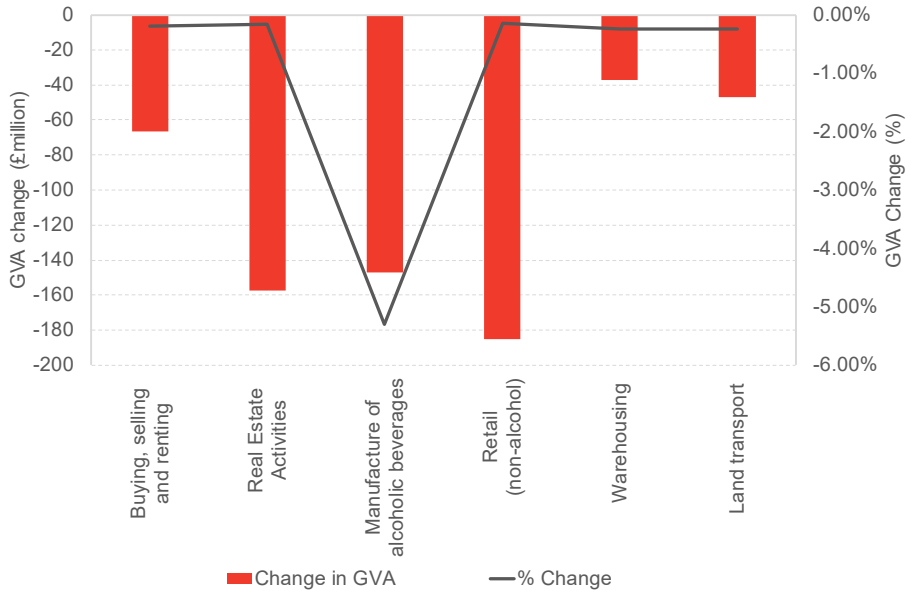
[12] GVA is a more important measure for the economy and is closer related to GDP

[13] There were also 30,000 jobs in alcohol production.

[14] Due to a large percentage of part-time workers in the alcohol sales industry the FTE results would be much lower than the 740,000. Using a scaling factor of 0.5 the FTE becomes 370,000, which with a 10% reduction is in the same magnitude of the model results.

In Chart 5 we investigate the GVA changes from some of the sectors not immediately impacted by the adverse shock in the model. With the reduction in the sale of alcohol there is a large reduction (in value) in the GVA in the sectors linked to these activities (buying, selling & renting; retail; and real estate). Also, the reduction in sales with the lower demand for alcohol results in a fall in the manufacturing of alcohol. The percentage reduction is much less than in sales. This is because a significant share of alcohol manufacturing sales are exports (33.5%). To meet demand, the alcohol sales industries must regularly replenish stock, thus the sales are linked to storage (warehouse) and transport (land) – reflected in the GVA changes.

Chart 5: GVA changes in industries not immediately impacted.



Source: Fraser of Allander Institute

4.2 Scenario 2 – 10% shift from on-trade off-trade

In this scenario the total consumption of alcohol by volume does not change, but tastes shift away from on-trade and to off-trade, which has lower average costs and inputs. As we would expect, the negative impacts on the economy are smaller than in Scenario 1 with the output impact being 39.1%, GVA 40.1% and employment 36.4% less. However, the impact is significant and negative, reflecting the fact that the on-trade alcohol sales sector is much more labour-intensive than the off-trade sector and makes a higher contribution to GVA.

Table 3: Impacts on output, value-added and employment.

	Direct	Indirect	Induced	Total
Output (£million)	-1,211	-1,263	-3,518	-5,991
Output (% change)	-0.04%	-0.05%	-0.13%	-0.22%
GVA (£million)	-392	-529	-573	-1,495
GVA (% change)	-0.03%	-0.04%	-0.04%	-0.11%
FTE (person years)	-23,347	-7,617	-9,305	-40,269
FTE (% change)	-0.09%	-0.03%	-0.04%	-0.16%

Source: Fraser of Allander Institute

Chart 6: Employment variations between simulations 1 and 2.

Source: Fraser of Allander Institute

While there is a smaller employment effect in this scenario compared with the Scenario 1, the employment change within the manufacturing of alcohol is marked. The impact from a 10% reduction is only slightly greater than from the switch in preferences for the distribution channel, where the alcohol consumption by volume does not change. This occurs because, according to the IO table UK, manufacturing of alcohol sells very little (1.3%) directly to retail (off-trade) sector with a much higher percentage (50.1%) of sales to the on-trade. Thus, the decrease in on-trade sales is the dominant effect.

4.3 Scenario 3 – 10% reduction with general reallocation of spending

In this scenario we find that although, by construction, there is a zero net direct output effect on the economy[15], there are indirect and induced effects along with GVA and employment effects. With a 10% reduction and reallocation of spending (based on the IO table) there is a small positive GVA impact of £23 million even though there is an economy-wide output reduction of £700 million. Also, FTE employment falls by 21,680 with the largest part of this reflecting the direct effect (18,840). These results imply that while there are fewer jobs, they are better paid jobs with higher levels of value-added per employee.

Table 4: Impacts on output, value-added and employment.

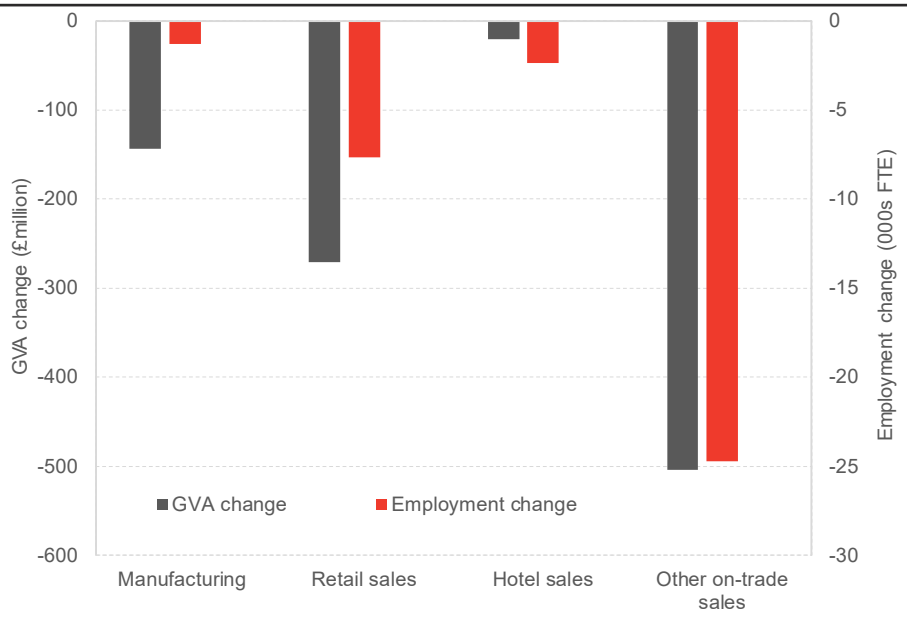
	Direct	Indirect	Induced	Total
Output (£million)	0	-414	-356	-770
Output (% change)	0.00%	-0.02%	-0.01%	-0.03%
GVA (£million)	258	-131	-104	23
GVA (% change)	0.02%	-0.01%	-0.01%	0.00%
FTE (person years)	-18,843	-1,152	-1,686	-21,681
FTE (% change)	-0.08%	0.00%	-0.01%	-0.09%

Source: Fraser of Allander Institute

[15] We have assumed that the total expenditure in the economy is the same as in the base year, thus there is zero net direct output effect.

Chart 7 investigates the employment and GVA effects in the alcohol sectors (three sales sectors and manufacturing). All four are negatively affected in terms of both employment and GVA due to the reduction of sales. The greatest part of the employment and GVA reduction occurs in the other-on trade sector. That is because this sector has by far the largest sales value and is more labour intensive when compared with the other sales sectors. There are many jobs within this sub-sector but they are low paying.

Chart 7: GVA and employment changes for alcohol sectors.



Source: Fraser of Allander Institute

4.4 Impacts on tax revenues – Scenarios 1-3

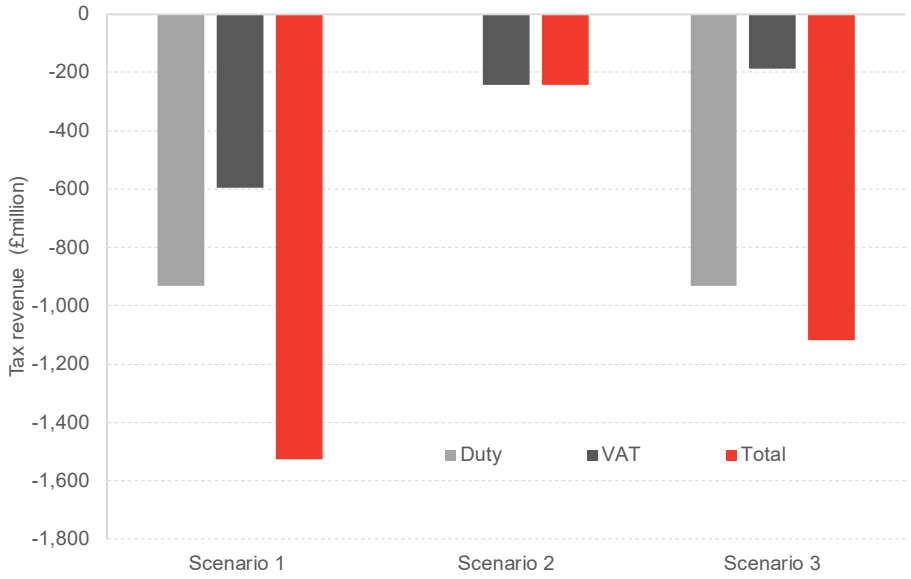
In addition to general macroeconomic impacts there is also interest in the effect of the first three scenarios on the revenues of the UK Treasury from alcohol duty and VAT, which is reported in Chart 8.

In all three scenarios the overall revenues of the UK Treasury decrease. In Scenario 1 we find the largest decrease (£1.53 billion) with both alcohol duty and VAT seeing a decrease. In Scenario 2 only VAT revenues decline. This occurs because alcohol duty is dependent on the volume of alcohol sold[16] and in Scenario 2 this does not change; only the value of sales changes, which affects VAT. In Scenario 3, the reduction in alcohol duty[17] is the same as in Scenario 1, but the reduction in VAT is significantly smaller since the reallocated spending mitigates the loss of VAT.

[16] There is a fundamental assumption made in Scenario 2 that the alcohol beverage mix being substituted is the same for off-trade as on-trade. However, people are more likely to drink beer on trade and wine/spirits off-trade, which will impact the tax revenue.

[17] Even though there is a reduction in alcohol duty the reallocation of spending increases the level of other taxes (e.g. fuel duty).

Chart 8: UK Treasury income changes Scenarios 1-3.



Source: Fraser of Allander Institute

4.5 Scenario 4 – 10% reduction with alternative reallocation of spending

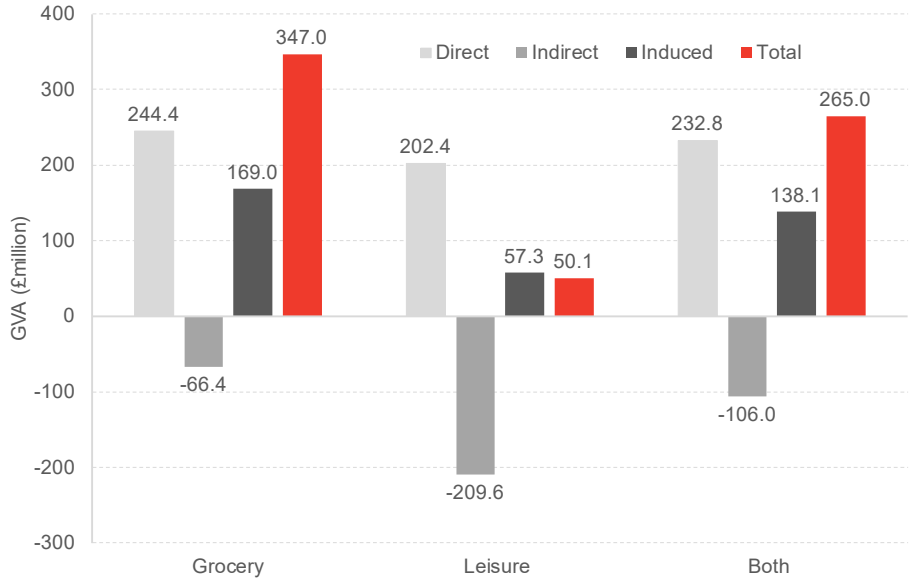
In this scenario three separate reallocation simulations were performed, assuming that income saved from lower consumption of alcohol is spent on: grocery products alone; leisure activities alone; and both groceries (e.g., food & drink and clothing) and leisure (e.g., sports, recreation, library etc.) activities. The composition of each category is listed in Appendix D. Similar to Scenario 3, reallocation of the spending by activity is based on information found within the original UK IO table and calculated using the following formula:

$$R_i = \sum R \frac{Hs_i}{\sum_i^n Hs} \qquad (1)$$

where R is the reallocated spending and Hs is the household expenditure from the original IO table.

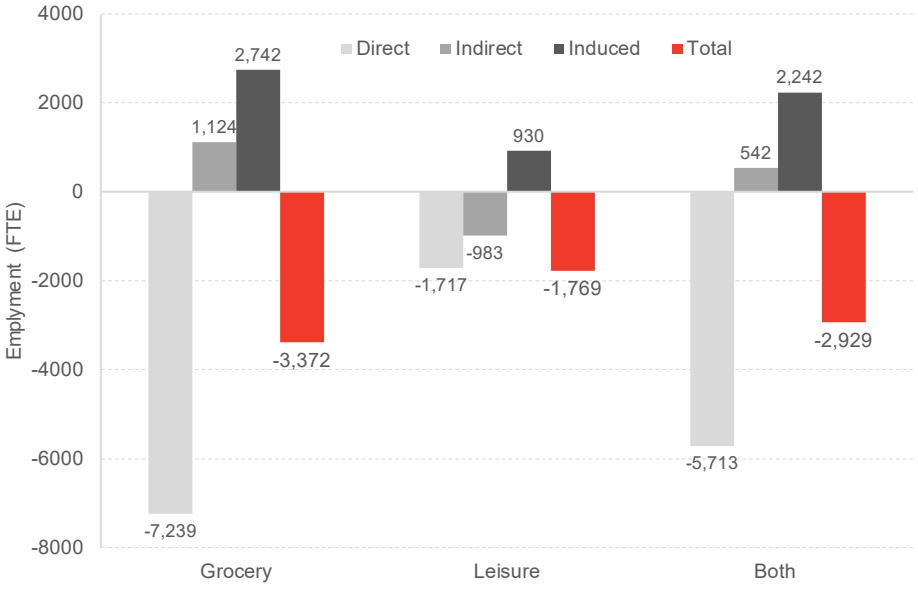
GVA results are presented in Chart 9 and employment impacts in Chart 10.

Chart 9: GVA results for reallocation of spending.



Source: Fraser of Allander Institute

Chart 10: Employment results for reallocation of spending.



Source: Fraser of Allander Institute

From Chart 9 it is clear that in all three simulations total GVA impacts are positive. The Grocery simulation has net GVA impacts of £347 million, Leisure simulation £50.1 million and the combined simulation £265 million. These impacts are much greater than in Scenario 3 (£23 million) indicating that the grocery and leisure activities are more value added intensive than the general increase in consumption considered there.

In all three simulations of Scenario 4 there is an overall loss of employment, but it is smaller in magnitude than in Scenario 3. Chart 10 shows that both the direct and indirect employment impacts are negative as in Scenario 3. However, unlike in Scenario 3, the reallocation to only grocery and leisure activities leads to an increase in induced employment.

The minimum and maximum limits for the GVA impacts of a reallocation of spending with a 10% reduction in alcohol sales were calculated. Using the GVA multipliers from the disaggregated IO table multipliers it is apparent that a unit change in final demand for Education has the highest impact on GVA whereas Manufacturing of Coke and Petroleum Products has the lowest[18]. By assuming all household consumption is reallocated to Manufacturing of Coke and Petroleum Products we find the maximum possible reduction in GVA of £1711.1 million and by assuming all reallocation is to Education we find the maximum possible increase in GVA of £ 1025.3 million.

This analysis was also carried out for employment effect – the largest employment multiplier is in Forestry and the lowest is in Manufacturing of Coke and Nuclear fuel. Through the reallocation of spending we find the maximum employment impact to be a gain of 49,500 FTEs and the minimum a loss of 54,500 FTEs.

4.6 Scenarios 5 and 6 – 10% increase in alcohol duty with and without recycling of additional government revenues

With the alcohol duty increase, without the recycling of additional government revenues (scenario 5), there is only a reduction in alcohol consumption similar to scenario 1. Alcohol duty only makes up part of the total price of alcohol thus with the 10% increase in tax we find a much lower increase in consumer prices. As identified earlier, the reduction in consumption depends on the own price elasticities. With a 10% increase in duty the reduction in alcohol sales amounts to 1.1%. Table 5 shows than with this increase in tax there is an overall negative effect on the economy: -£294 million GVA and -7,324 FTEs.

The increase in tax also impacts government revenues, with an overall net positive impact of £788.7 million. A 10% increase in tax results in an increase in government revenue through increased alcohol duty of £835.4 million. However, the associated reduction in consumption generates a net (assuming standard VAT rate and accounting for change in VAT on alcohol duty) reduction in VAT revenue of £46.7 million.

Table 5: Impacts on output, value-added and employment with no reallocation of expenditure.

	Direct	Indirect	Induced	Total
Output (£million)	-233	-203	-400	-837
Output (% change)	-0.01%	-0.01%	-0.01%	-0.03%
GVA (£million)	-89	-88	-117	-294
GVA (% change)	-0.01%	-0.01%	-0.01%	-0.02%
FTE (person years)	-4,059	-1,370	-1,895	-7,324
FTE (% change))	-0.02%	-0.01%	-0.01%	-0.03%

Source: Fraser of Allander Institute

Scenario 6 recycles the £788.7 million net increase in tax revenues by increasing spending following the pattern of government expenditure within the original UK IO table. Table 6 demonstrates that in this case there is a positive impact on employment of 17,041 FTE jobs and GVA of £847 million.

[18] We recognise that it is unrealistic to assume that all reallocation of spending could be passed to either Education or the Manufacturing of Coke and Petroleum. The object here is simply to identify the upper and lower bounds of GVA impacts.

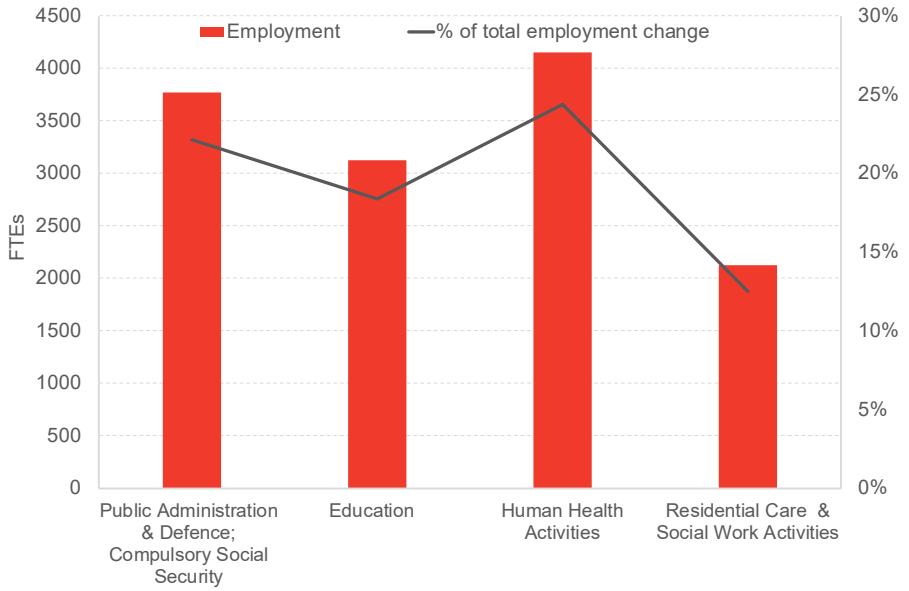
Table 6: Impacts on output, value-added and employment with reallocation of expenditure.

	Direct	Indirect	Induced	Total
Output (£million)	555	176	1,423	2,154
Output (% change)	0.02%	0.01%	0.05%	0.08%
GVA (£million)	333	100	415	847
Output (% change)	0.02%	0.01%	0.05%	0.08%
FTE (person years)	7,478	2,828	6,735	17,041
FTE (% change))	0.03%	0.01%	0.03%	0.07%

Source: Fraser of Allander Institute

Chart 11 illustrates the changes in employment in four sectors, which account for a large fraction (77.3%) of the overall employment changes with the recycling of alcohol duty. Of the overall 17,041 increase in FTEs: 3,772 are attributed to public administration and defence; 3,128 to education; 4,153 to health and 2,127 to residential care and social work.

Chart 11: Sectoral employment with Government reallocation of spending.



Source: Fraser of Allander Institute

Conclusion

Chapter 5

The focus of this report is to examine the potential macroeconomic impacts of changes in UK alcohol consumption. For this purpose we apply an input-output (IO) approach with three disaggregated alcohol consumption sectors: accommodation, other on-trade and off-trade. In this report we explore several scenarios that cover a wide range of possible consumption changes.

In the first two scenarios the focus is solely on the impact of reductions in the consumption of alcohol in the UK, which could be due to a change in tastes, for example, in part motivated by a successful health campaign on the dangers of alcohol consumption. Over recent years there have been significant changes in UK alcohol consumption, with both an overall reduction as well as a shift in composition from on-trade to off-trade consumption. Scenario 1 investigates the impacts of a 10% reduction in consumption across all three sectors. This corresponds broadly to the approach of sector "impact studies", which attempt to determine the output and employment attributable to any given sector (or part of a sector). As would be expected, this has a detrimental impact on the economy with the loss of employment of 63,344 full-time equivalents (FTEs) and a reduction of £2,579 million in gross value added (GVA). Scenario 2 investigates the impacts of a 10% shift from on-trade consumption to off-trade. Again Scenario 2 has a negative impact on the economy. Not surprisingly, the scale of the change in composition of the sector is less than that found for an overall reduction considered in Scenario 1. Here there is a reduction in GVA of £1,495 million and in employment 40,269 FTEs. These results indicate that the recent UK trend of more off-trade and less on-trade consumption has a significant adverse impact on the economy, as the on-trade alcohol sector is more value-added and labour intensive than the off-trade sector.

The first two scenarios focus solely on the reduction in alcohol consumption (at least by value). These simulations effectively assume that households save the income that would otherwise be spent on alcohol. However, it seems more likely that households would use the income not spent on alcohol to buy other goods and services. Scenarios 3 and 4 explore this idea by investigating the economic impact of a 10% reduction in alcohol consumption combined with a reallocation of spending to the outputs of other sectors within the economy. In Scenario 3 we assume that the reallocation of spending is in the same proportions as household expenditures found within the original IO table. With this reallocation we find that, while there is still a loss of employment (-21,681 FTEs), national GVA actually increases by £23 million. This demonstrates the importance of the assumption concerning the use of the income freed by any reduction in alcohol consumption, and the limitations of industry impact studies in analysing the consequence of a shift away from alcohol.

Scenario 4 investigates the reallocation of spending further with simulations that explore the impact of switching spending to groceries and/or leisure activities. We find that there are positive impacts on national GVA ranging £50-347 million. However, we continue to find that there are negative impacts on employment.

While a reduction in alcohol consumption has the potential to have negative impacts on the economy, it is not necessarily so. However, whatever the effects on the economy, there are positive health and societal impacts of a reduction in alcohol consumption. These include the significant costs of treating health problems caused by alcohol consumption. Because of this it may be socially beneficial for governments to reduce alcohol consumption by raising taxes on alcohol. Scenarios 5 and 6 investigate the macroeconomic impacts of the UK Government increasing alcohol duty by 10% across all types of alcohol. In Scenario 5 the tax is introduced in isolation, which acts in a manner similar to a reduction in alcohol consumption (as in Scenario 1). The 10% rise in tax leads to reductions in employment of 7,324 FTEs and in GVA of £294 million. However, the UK Government would benefit from an increase in tax revenue of £788.7 million. In Scenario 6 the Government is assumed to recycle this increase in tax revenues by increasing its general expenditure (based on the pattern of current government spending in the original IO table). This revenue recycling stimulates government spending and leads to net positive impacts of a 10% increase in alcohol tax of £847 million GVA and 17,041 FTEs.

A number of conclusions follow. First, it is clear, and not surprising, that a simple reduction in the consumption of alcohol (with the freed disposable income being saved) would have significant negative effects on the UK economy. This analysis broadly captures the approach of conventional industry "impact studies", and neglects the possible alternative uses of freed disposable income.

Second, however, it seems likely that any shift in tastes away from alcohol consumption would lead to increased consumption on other goods and services. In general, this makes the net impact on the UK economy of such a shift in tastes ambiguous. In all four reallocations carried out in this report we find that there is an increase in GVA but a loss in employment, which with alcohol sales (in general) being a less GVA intensive but labour intensive sector, is the expected result. If the reallocated spending is goods and services that are more value-added and employment intensive than the alcohol sector, the net impact on both would be positive (and vice versa). In this sense, the argument that a shift away from alcohol consumption is bad news for the economy is not at all clear cut.

Third, irrespective of the impact of reduced consumption on the economy, it will have a beneficial impact on health and Government may decide this is sufficient reason to increase alcohol duties. If it does that without recycling revenues from the tax, the impacts on the economy are, again unsurprisingly, negative. However, if the revenues are recycled, we find that there is a net stimulus to economic activity. This suggests that such a tax policy may yield a "double dividend", simultaneously increasing economic activity while reducing alcohol consumption and improving health.

A number of extensions to this research would yield important additional insights from a policy perspective. First, the analysis could be extended to include explicit modelling of changes in the consumption of alcohol, including responsiveness to relative prices. Second, it would be beneficial to relax the rather restrictive assumption, embedded in input-output approach, of an entirely passive supply side, to reflect the presence of supply-side constraints on the UK economy. A computable general equilibrium (CGE) framework would accommodate these developments, and allow a more rigorous exploration of the impact of changes in tastes and/ or taxes. Finally, such a framework would also facilitate systematic investigation of the adverse supply-side impacts of alcohol consumption arising from, for example, increased absenteeism, presenteeism and mortality.

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Appendix A – Input-Output methodology

An IO model can be regarded as a special case of a Computable General Equilibrium (CGE) model with several key assumptions. The first of these is the passive supply side, assuming at all times that it is possible for supply to increase to meet any changes in final demand; the model is entirely demand-driven. Also, in IO models the assumption is made that both commodity prices and technical coefficients are fixed and there is no substitution of inputs.

Fundamentally IO models are a set of simultaneous equations representing the linkages within an economy, illustrated in equations 1 and 2.

$$x_i = z_{i1} + \cdots z_{ij} + f_i \qquad (1)$$

$$x_i = \sum_{j=1}^{n} z_{ij} + f_i \qquad (2)$$

The output x of sector i is determined by the sum of industrial (intermediate) sales z_i and final demand f_i. Expanding equation 2 for all the sectors and re-establishing in matrix form gives equation (3)

$$\boldsymbol{x} = \boldsymbol{Zi} + \boldsymbol{f} \qquad (3)$$

Introducing the A matrix – which calculates the technical coefficients – as $a_{ij} = \frac{z_{ij}}{x_i}$ [19] allows for the rearrangement of Equation 3.

$$\boldsymbol{x} = \boldsymbol{Ax} + \boldsymbol{f} \qquad (4)$$

$$\boldsymbol{f} = \boldsymbol{x} - \boldsymbol{Ax} \qquad (5)$$

$$\boldsymbol{f} = \boldsymbol{x}(\boldsymbol{I} - \boldsymbol{A}) \qquad (6)$$

$$\boldsymbol{x} = (\boldsymbol{I} - \boldsymbol{A})^{-1}\boldsymbol{f} \qquad (7)$$

$$\Delta\boldsymbol{x} = (\boldsymbol{I} - \boldsymbol{A})^{-1}\Delta\boldsymbol{f} \qquad (8)$$

A change in in final demand will affect the output of a sector. $(I - A)^{-1}$ is known as the Leontief inverse matrix which contains the economic structure of the economy. As identified in section 3.1 direct, indirect and induced impacts can be measured using IO models, determined by the closure of households within the model.

[19] The A matrix calculates the technical coefficients i.e the proportion of inputs that sector i contributes to the total outputs. It is used as a measure of the linkages in the economy.

Appendix B – Construction of the alcohol-disaggregated input-output table

One of the fundamental stages within this project involves developing an alcohol-disaggregated IO table (from the UK 2010 industry by industry table constructed by the Fraser of Allander Institute). The table is then used to calibrate an IO model with a disaggregated alcohol consumption sector, which embodies a number of important assumptions (most notably a passive supply side). The IO model is used to assess the impact of successful policies to shift tastes away from alcohol, and to analyse the impact of an alcohol tax. Throughout we recognise that "Alcohol" is an industry that has two distinct components: manufacturing and consumption-oriented activities.

In the original UK IO table there is a single sector (SIC 11.01-11.06) which represents the manufacturing of all alcohol. More than a third (33.47%) of sales of the manufacturing of alcohol sector are exports. 58.77% of manufacturing sales are intermediates with these sales being predominantly to both the "accommodation" (12.19%) and "food & beverage services" (37.81%) sectors.

Unlike the manufacturing of alcohol there is no single industry within the UK table that captures the supply of alcohol for consumption; alcohol consumption is delivered through several industries. Alcohol is consumed within the "wholesale/retail" (46), "accommodation" (53) and "food & beverage service industries" (55). Of course, alcohol-related activities form only a part of each of these sectors. All three sectors have to be disaggregated to identify their alcohol sales activity.

In IO tables the rows represent the sales from an industry to other industries and to final demand, while the columns represent the input purchases to generate the output. Both the rows and columns need to be disaggregated for each of the three sectors identified as important with respect to alcohol consumption.

For the disaggregation of the rows information is needed on the sales value of alcohol for each of the three consumption industries. Monitoring and Evaluation Scotland's Alcohol Strategy (MESAS) publish off-trade sales figures which allow for the calculation of the alcohol sales from the UK retail industry[20]. Alcohol sales for the accommodation and food + beverage services industries were calculated using a combination the MESAS figures along with information found within the BBPA handbook.

As the focus of this project is on the consumption of alcohol, when disaggregating the sales it was assumed that only households and tourists consume alcohol and the sales percentage of each was taken from the information found in the original UK IO table. For example, in the original accommodation sector 5% of combined sales from tourist and households was attributed to households thus in the disaggregated IO 5% of the alcohol sales are to households. This was carried out for the disaggregation of the three sectors.

The UK industry by industry (IxI) IO table is generated in basic prices so that the alcohol sales value for each of the three industries must be converted to the same basis. This was carried out using information on the alcohol duty (available from HMRC (2018) as well as standard VAT (20%).

As with the sales, the inputs (columns) must be disaggregated with regards to alcohol consumption for each of the three industries. A key fundamental principle of IO tables is that for any industry total sales must equal the total input, which is used for the disaggregation. For the accommodation and retail industries – as different products are sold on the same premises – the starting point of the estimate for intermediate consumption was based on sales value compared with the original UK industry. Whereas for the food and beverage services industry – which involves many different activities – the disaggregation of intermediate inputs was based on licensed premises' running costs.

Just as not all UK manufactured alcohol is consumed locally, not all UK consumed alcohol is manufactured in the UK. There is a high level of alcohol imported to the UK. Information from HMRC allows the value of imports for a variety of types of alcohol to be found. Combining this information with that in the BBPA handbook allows us to estimate imports by each disaggregated sector: In the disaggregation the assumption was made

[20] MESAS figures only include Scotland and England + Wales, to account for NI scaling was undertook based on the alcohol duty by region of the UK available from HMRC.

that hotels are stocked entirely from the UK, through either alcohol production or retail. However, we assume that the food & beverage activities and retail rely on both imported as well as locally produced alcohol.

With the above information the 103 UK industry by industry table was disaggregated to a 106 industry alcohol-disaggregated table, which was used to calibrate the IO model used to determine the economy wide effects of a reduction in the demand for alcohol. The simulations carried out are detailed in the main text of the report.

Appendix C – Alternative alcohol own-price elasticises

Table C1: Own price elasticise by type of alcohol: Collis et al (2010).

	On-trade	Off-trade
Beer	-0.77	-1.10
Cider	-0.85	-1.13
Wine	-0.46	-0.54
Spirits	-1.15	-0.9
RTDs	-0.91	-0.93

Source: Fraser of Allander Institute

Appendix D – Activities included in the reallocation of spending for scenario 4

Grocery

- Wholesale and retail (non-alcohol)
- Manufacture of bakery products
- Manufacture of dairy products
- Manufacture of soft drinks and bottled water
- Manufacture of grain mill products and starches
- Manufacture of clothing apparel
- Manufacture of soap, detergents and cleaning products

Leisure

- Food and beverage services (non-alcohol)
- Accommodation (non-alcohol)
- Motion picture, video and TV programming
- Sports/Amusement and recreation
- Libraries and other culture activities

Grocery & Leisure

- Wholesale and retail (non-alcohol)
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