Is a 50p minimum unit price for alcohol the right level for Scotland?

Submission to the Scottish Government consultation

January 2018

Cebr

Disclaimer

Authorship and acknowledgements

This report has been produced by Cebr, an independent economics and business research consultancy established in 1992. The views expressed herein are those of the authors only and are based upon independent research by them.

Molson Coors has provided the funding required for Cebr to provide an independent assessment of minimum unit pricing in Scotland. The report does not necessarily reflect the views of Molson Coors.

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Contents

Executive summary

This is the summary of a report by the Centre for Economics and Business Research (Cebr) that presents the results of an independent assessment of whether a minimum unit price of 50p for alcohol in Scotland can be said to be proportionate and sufficiently targeted in light of the stated objective of the policy. The report presents what we believe is compelling evidence to suggest that a 'blanket' 50p MUP may not provide a solution that best meets these criteria, but that an alternative, banded MUP is likely to perform better.

Purpose, objectives, approach and methodology

The Scottish Government's stated policy objective for minimum unit pricing is to tackle harm resulting from excessive consumption of "cheap, strong alcohol." In considering the level at which the minimum unit price should be set, the Government has relied upon evidence from the University of Sheffield. Cebr is thus concerned about the potential reliance on out-of-date and inadequate appraisals of the impacts of a flat 50p MUP for alcohol in Scotland. This raises the question whether the Scottish Government can be confident that a MUP set at this level for all alcohol beverages is in fact proportionate.

But Cebr also has fundamental doubts about the robustness of the methods and underlying assumptions used in the Sheffield University appraisals, given the potential for the Sheffield University Alcohol Policy Model to significantly exaggerate the benefits of alcohol MUP, whilst providing a wholly inadequate treatment of the regressive re-distributional implications of a flat MUP set at 50p or at any other level.

Up to now, the evidence points to a 50p MUP being highly regressive in its re-distributional consequences, with the negative consumer welfare impacts falling disproportionately on the poorest in society – those living in poverty, generally associated with the bottom two income deciles. We have sought to update the evidence on these effects. The analysis raises questions about the proportionality of a flat 50p MUP and about whether it is appropriately targeted.

That motivated Cebr to consider whether an alternative MUP policy might have a less regressive re-distributional impact. The alternative policy assessed sets higher MUPs for higher strength products, vary according to the ABV of the alcoholic beverage. Our assessment of this scheme against the blanket 50p option reveals a route that is equally effective in reducing alcohol consumption, especially to harmful levels through the availability of strong products that are excessively cheap. But our findings also suggest that it could be significantly less regressive in re-distributional term, imposing a less detrimental impact on the poorest drinkers and their families.

An altered landscape requires a new model baseline

Cebr has gathered and assessed the latest available data on the drinker population in Scotland and the socioeconomic characteristics of that population, as well as on sales volumes of the various categories of alcohol beverage, their strength and their pricing. The findings of this assessment are that:

- Relying on the Sheffield University analysis of a flat 50p MUP, the Scottish Government has asserted the expected outcomes from the policy. However, some of the expected outcomes are not necessarily supported under the new baseline model. For example,
  - The Sheffield University baseline understates the population of hazardous and harmful drinkers by 49,000 relative to updated 2014 data and by 69,000 adults compared to 2016 data, resulting in a likely over-statement of baseline average levels of alcohol consumption amongst this drinker group. (This situation is reversed in the case of the moderate drinker population.)

  - Changes in the baseline socioeconomic profile of the Scottish drinker population can likewise be expected to impact on SU's baseline estimates of the mean alcohol consumption levels of those in poverty compared to those not in poverty. This will again have implications in terms of the anticipated magnitude of the impacts of a 50p MUP.

- Correcting for these changes to better reflect today's circumstances is found to reduce the estimated benefits of the policy. If the flat 50p MUP were to be re-appraised today by Sheffield University, Cebr predicts that it would find the policy to be less impactful. This is illustrated in the table below in which the shift to a 2016 baseline is shown to reduce the predicted reductions in annual average levels of alcohol consumption from Sheffield University's estimates (highlighted in the first row).

Table 1: Effects of a 50p MUP on alcohol consumption, Sheffield University elasticities

Change in number of units of alcohol consumed by drinker type and income status							
50p MUP		Moderate		Hazardous		Harmful	
Baseline	Description	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
2014-SU	Original SU 2014 baseline	-10	-3	-88	-30	-681	-181
2014-Act	2014 baseline based on updated data	-8	-3	-68	-31	-528	-189
2016-Act-SUDG	2016 with SU drinker group assum.	-7	-2	-69	-29	-525	-175
2016-Act-Cebr	2016 with Cebr drinker group assum.	-7	-3	-68	-29	-515	-172

Source: Sheffield University - latest appraisal of MUP in Scotland, Cebr analysis

- If the policy is expected to produce less of an impact on alcohol consumption than was appraised by Sheffield University, then it can also be expected to deliver less of the health-related improvements that are purported to be the key social benefit of the policy. This would mean that the expected health-related benefits predicted by Sheffield University to result from a 50p MUP are likely to be exaggerated. In these circumstances, the conclusion of the Scottish Government that 50p is the proportionate level cannot be said for certain to be based on unbiased evidence.

- This is important because the negative implications of any policy will look less detrimental if the benefits are exaggerated. Similarly, the negative implications will look more detrimental if the benefits can be shown to be overestimated and by how much they need to be reduced to eliminate the bias.

Flawed assumptions driving exaggerated benefits

Cebr continues to be of the view that the Sheffield University appraisals are built on weak foundations that most likely to lead to exaggerated estimates of the benefits of a flat MUP at any level, including the proposed 50p. The findings of this element of Cebr's assessment are that:

- Driving any estimates of the impact of a MUP policy for alcohol are the underlying behavioural assumptions for drinkers – that is, how they will respond to the policy. But the evidence supporting the proposition that MUP can reduce alcohol consumption by the amounts estimated by Sheffield University is underpinned by an assumption that all drinkers will respond uniformly. This is fundamentally flawed. A uniform response is highly unlikely and any estimates of the benefits of a 50p MUP made on the basis of this highly simplifying assumption must be treated with caution because they are more than likely going to be exaggerated.

- We also have doubts of the methodological underpinnings for the alcohol demand elasticities produced by Sheffield University and used in its last appraisal of the policy in Scotland. For that reason, Cebr equipped its models to reproduce the estimates of impact under alternative elasticity assumptions.

- Switching to the alcohol demand elasticities produced by HMRC suggests that the predicted impacts starting from a 2016 model baseline are considerably lower than the impacts projected by Sheffield University under its 2014 assumptions. The comparison between Table 1 above and Table 2 below provides further evidence of the possibility that the impacts in the last Sheffield University appraisal are overstated and do not provide a robust basis for deciding whether a 50p MUP is a proportionate policy for Scotland today.

Table 2: Effects of a 50p MUP on alcohol consumption, HMRC elasticities

Change in number of units of alcohol consumed by drinker type and income status						
50p MUP	Moderate		Hazardous		Harmful	
Baseline	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
2014-SU	- 12	- 3	- 106	- 36	- 709	- 188
2014-Act	- 8	- 3	- 72	- 33	- 557	- 199
2016-Act-SUDG	- 9	- 3	- 91	- 39	- 595	- 199
2016-Act-CebrDG	- 10	- 3	- 89	- 38	- 585	- 195

Source: Cebr analysis

- Cebr still contends, however, that hazardous and harmful drinkers can be expected to have lower demand responsiveness to price changes and that the demand elasticity assumptions underlying the appraisal of MUP should be adjusted accordingly. The impact of doing this is shown in Table 3, which can be compared with the previous two tables. This shows a significant dilution of the expected reductions in alcohol consumption relative to Sheffield University's estimates, regardless of whether its own or HMRC's demand elasticity assumptions are adopted.

Table 3: Effects of a 50p MUP on alcohol consumption, Cebr elasticities

Change in number of units of alcohol consumed by drinker type and income status						
50p MUP	Moderate		Hazardous		Harmful	
Scenario	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
2014-SU	- 18	- 5	- 75	- 25	- 566	- 150
2014-Act	- 14	- 5	- 58	- 27	- 438	- 157
2016-Act-SUDG	- 14	- 5	- 63	- 27	- 461	- 154
2016-Act-CebrDG	- 15	- 5	- 62	- 26	- 453	- 151

Source: Cebr analysis

- Given that the flat 50p MUP policy is expected to be less impactful than predicted in reducing alcohol consumption, it can also be expected to be less effective in reducing alcohol-related deaths and hospitalisations. Sheffield University's predictions of the health-related benefits of the policy are, therefore, most likely exaggerated. The evidence on which the Scottish Government has reached the conclusion that 50p is the proportionate level for an alcohol MUP could thus be biased.

- Neither do the Sheffield University appraisals provide an adequate treatment of the potential unintended consequences of an alcohol MUP policy. For instance, no account is taken of:

  – The increased likelihood of financially squeezed drinkers seeking out cheaper sources of illicit alcohol. The Scottish Government notes the recommendation of the World Health Organisation to reduce the affordability of alcohol in order to reduce alcohol-related harm. But it fails to note that, on the basis of the established relationship between affordability and counterfeit and contraband alcohol, the WHO also notes that restrictions on the availability of alcohol that are too tight can promote the development of parallel illicit markets.

  - The potential for poor drinkers to seek out surrogate alcohol if alcohol beverages become too expensive.
  - An increased likelihood of cross-border purchases by Scottish drinkers so long as there is policy asymmetry between Scotland and other parts of the UK.

- Proper account of these factors would almost certainly cause a MUP policy to be less effective in deterring alcohol consumption and, thus, in reducing the associated health-related harms. Any estimates of these impacts that do not take account of these factors are likely to be exaggerated.

Regressive re-distributional consequences of a flat 50p MUP

Cebr's assessment suggests that a flat 50p MUP is significantly regressive in its impacts on redistribution. This is borne out by the following findings:

- The Sheffield University appraisals are bound to paint a favourable picture of this aspect of the policy as they only reveal whether consumers will spend more or less on alcohol once the policy is introduced. Sheffield University only evaluates how much more or less people will spend on alcohol per annum *after* taking account of the price increases that will result from MUP and the demand responses that occur as a result.

- But the appraisals say nothing about the fact that, for the general population, the vast majority of which are non-problem drinkers, higher alcohol prices can be expected to have a negative impact on the welfare of consumers by raising their cost of living and reducing their living standards. Thus, MUP has the potential to exacerbate inequality. At the limit, the policy could impose significant hardship on the families of problem drinkers who continue to drink at harmful levels despite the introduction of a 50p MUP, thus diverting family resources away from other needs.

- This is because it is not the case that only cheap, strong alcohol will be affected. Significant amounts of all types of beverage are currently being sold at less than 50p, not just the strong products. This means that it is not just the people who drink cheap, strong alcohol that will be affected. Anyone drinking cheap, weak alcohol will be affected in the same manner. It would, in Cebr's view, be a gross over-simplification to conclude that this is likely to make "very little difference" to the average drinker, or even the average moderate drinker. For the average or moderate drinker on a very low income, it can mean a lot relative to the household budget.

- By way of illustration, Table 4 shows the value of the consumer welfare losses per Scottish household based on Sheffield University's 2016 appraisal (using 2014 data). This shows that, regardless of drinker group, a disproportionate burden of the policy falls upon the poorest in society, with those in the bottom four income deciles suffering the greatest impact on their cost and standard of living.

Table 4: Total value of consumer losses per household after the introduction of a 50p MUP, by drinker type and income decile, Sheffield University elasticities and 2014 baseline

2014-SU	Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Highest
Sheffield Uni.	ten	decile	decile	decile	decile	decile	decile	decile	decile	ten
50p MUP	per cent	group	group	group	group	group	group	group	group	per cent
MODERATE	-£ 28	-£ 42	-£ 9	-£ 13	-£ 15	-£ 17	-£ 22	-£ 26	-£ 27	-£ 36
HAZARDOUS	-£ 214	-£ 316	-£ 569	-£ 102	-£ 116	-£ 130	-£ 176	-£ 208	-£ 212	-£ 284
HARMFUL	-£ 933	-£ 1,380	-£ 2,247	-£ 757	-£ 406	-£ 455	-£ 616	-£ 727	-£ 740	-£ 992

Source: Cebr analysis

- This feature is maintained across the different starting baselines, 2014 or 2016, and whether the demand elasticity assumptions of Sheffield University or HMRC are used, as illustrated in Table 5 below.

Table 5: Total value of consumer losses per household after the introduction of a 50p MUP, by drinker type and income decile, HMRC elasticities, 2016 baseline

2016-Act-CebrDG	Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Highest
HMRC	ten	decile	decile	decile	decile	decile	decile	decile	decile	ten
50p MUP	per cent	group	group	group	group	group	group	group	group	per cent
MODERATE	-£ 32	-£ 38	-£ 11	-£ 14	-£ 15	-£ 18	-£ 23	-£ 26	-£ 29	-£ 41
HAZARDOUS	-£ 245	-£ 291	-£ 355	-£ 108	-£ 120	-£ 144	-£ 188	-£ 209	-£ 229	-£ 328
HARMFUL	-£ 989	-£ 1,172	-£ 1,861	-£ 909	-£ 405	-£ 487	-£ 633	-£ 705	-£ 773	-£ 1,106

Source: Cebr analysis

- These losses are by no means insignificant - the impacts on harmful drinkers in the three lowest income deciles each account for 4%, 5% and 8%, respectively, of the average annual expenditure of the average Scottish household. They can be expected to account for much larger shares of the decile-specific averages.
- These highly regressive features of the flat 50p MUP are of significant relevance in the context of the current economic climate, particularly the challenges presented by the significant depreciation in the value of sterling following the Brexit vote, the resulting rise in inflation and the further squeeze on household disposable incomes, given the UK's import dependence in the areas of food and drink. Minimum unit pricing but, in particular, the Scottish Government's proposed flat 50p option is likely to impose further hardship on families already facing significant increases in the cost of living and the continued erosion of their standard of living.

A less regressive ABV-banded MUP approach

The highly regressive consequences of the flat 50p MUP option motivated Cebr to consider whether there might be less regressive alternative ways to implement a MUP policy. We drew on the fact that the UK's duty regime recognises as a matter of public policy that lower strength alcohol beverages should incur a lower rate of duty and developed a similar ABV-banded MUP system. The alternative scheme that we have assessed is reflected in the following table.

Table 6: Banded MUP policy based on the strength of the alcoholic beverage

Alcohol Content by Volume	MUP
1.2% – 2.8%	30p
2.9% - 5.5%	40p
5.6% - 10%	50p
11% - 20%	60p
21% - 40%	60p

Cebr's assessment of this scheme suggests that:

- There is a clear economic rationale for a banded MUP system if, as we suspect, there are real physical constraints on the volume of alcoholic beverage (as opposed to pure alcohol) that it is possible for a person to drink. If it were physically impossible to consume the required levels of the alcohol beverage that is available at a price that fits within a drinker's budget constraint under a banded MUP system, the physical or preferential constraint (of not wanting to drink the amount of the beverage that achieves the required levels of inebriation) may actually 'force' or incentivise a reduction in their intake of alcohol units.
- In other words, the banded MUP system would force a trade-off for the harmful drinker by putting a premium on getting drunk fast. The drinker would have to choose between paying higher prices for higher strength products that will get him or her drunk quicker or lower strength products that fit better within their budget constraint but that will increase the time and effort it takes to achieve inebriation (in terms of the higher volume of alcoholic beverage that it is necessary to consume).
- Table 7 shows the performance of the banded MUP system relative to Sheffield University's predictions for a flat 50p MUP. It suggests that the banded MUP system could reduce alcohol consumption amongst hazardous drinkers in poverty by an additional 33-34 units per annum and amongst harmful drinkers in poverty by an additional 84-85 units per annum when modelled from an appropriate 2016 baseline.

Table 7: Performance of banded MUP relative to flat 50p in reducing alcohol consumption, Sheffield elasticities for flat 50p

Added reductions in units of alcohol consumed by drinker type and income status under BANDED MUP						
HMRC elasticities	Moderate		Hazardous		Harmful	
Baseline	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
2014-SU	3	1	32	11	43	11
2014-Act	2	1	24	11	33	12
2016-Act-SUDG	3	1	34	15	85	28
2016-Act-CebrDG	3	1	33	14	84	28

Source: Cebr analysis

- Table 8 provides the results of a similar comparison between the banded MUP system and the flat 50p option based on re-distributional grounds. This shows that the banded MUP policy is less regressive for harmful drinkers in the lowest income deciles – with a negative number indicating that the consumer welfare loss is smaller under the banded system than the flat 50p MUP. This is especially the case for those in the third income decile, who were projected to be particularly hard hit by a flat 50p MUP.
- The scheme is also more progressive in imposing greater consumer welfare losses on the higher income deciles than under the flat 50p MUP.

Table 8: Performance of banded MUP relative to flat 50p in terms of impact on welfare of individual drinkers, by drinker type and income decile, HMRC elasticities for flat 50p, 2014 baseline

2014-SU	Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Highest
HMRC elasticities	ten	decile	decile	decile	decile	decile	decile	decile	decile	ten
Banded MUP	per cent	group	group	group	group	group	group	group	group	per cent
MODERATE	£ 2	£ 2	£ 1	£ 2	£ 2	£ 2	£ 3	£ 3	£ 3	£ 5
HAZARDOUS	£ 19	£ 28	-£ 246	£ 14	£ 16	£ 18	£ 24	£ 28	£ 29	£ 38
HARMFUL	-£ 26	-£ 38	-£ 1,025	-£ 196	£ 12	£ 13	£ 18	£ 21	£ 22	£ 29

Source: Cebr analysis

- Table 9 illustrates how these properties hold when switching to a 2016 baseline. This produces an equally impactful change in the re-distributional consequences of introducing MUP through a banded system relative to a flat 50p.

Table 9: Performance of banded MUP relative to flat 50p in terms of the impact on welfare of individual drinkers, by drinker type and income decile, HMRC elasticities for flat 50p, 2016 baseline

2016-Act-CebrDG	Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Highest
HMRC elasticities	ten	decile	decile	decile	decile	decile	decile	decile	decile	ten
Banded MUP	per cent	group	group	group	group	group	group	group	group	per cent
MODERATE	£ 2	£ 2	£ 1	£ 2	£ 2	£ 2	£ 3	£ 3	£ 3	£ 5
HAZARDOUS	£ 18	£ 21	-£ 128	£ 13	£ 15	£ 17	£ 23	£ 25	£ 28	£ 40
HARMFUL	-£ 17	-£ 20	-£ 805	-£ 273	£ 11	£ 14	£ 18	£ 20	£ 22	£ 31

Source: Cebr analysis

- This evidence suggests that a banded MUP system, based on the different strength of alcohol beverages (their ABV), could provide a more progressive policy in its consequences for redistribution. Lower consumer welfare losses would be suffered by the poorest heaviest drinkers, whilst achieving broadly the same or superior results in terms of reducing alcohol consumption (particularly amongst this type of drinker) relative to those predicted by Sheffield University for a flat 50p MUP.
- Cebr is of the view, therefore, that the banded MUP system is worth exploring as a potentially equally effective policy in terms of meeting the stated objectives, but also an option for implementation that could do less damage in terms of its regressive distributional consequences. In other words, the banded MUP system has the potential to be a more proportionate and appropriately targeted policy than the flat 50p MUP that is currently considered by the Scottish Government to best fulfil these criteria.

1 Introduction

This report by the Centre for Economics and Business Research (Cebr) presents the results of an independent assessment of the proportionality of the Scottish Government's proposed 'blanket' 50p minimum unit price (MUP) at which alcohol can be sold in Scotland.

1.1 Purpose and objectives of the report

The Scottish Government's stated policy objective for minimum unit pricing is to tackle harm resulting from excessive consumption of "cheap, strong alcohol." The consultation paper states:

> *"…the Scottish Government…wants to target the price of drinks that are cheap and strong. These are the alcoholic drinks that tend to be drunk by people who are at more risk of harm due to their drinking.*
>
> *"This is why we need to introduce a measure that will target the cheap, strong alcohol that heavier drinkers tend to drink."*

In the paper, the Scottish Government goes on to say that:

> *"Taking into account a range of factors, the Scottish Government considers a 50 pence per unit minimum price provides a proportionate response to tackling alcohol misuse as it strikes a reasonable balance between public health and social benefits and intervention in the market."*

Molson Coors has provided the funding required for Cebr to provide an independent assessment of whether a minimum unit price of 50 pence can be said to be proportionate and sufficiently targeted in light of the stated objective of the policy. The results of this assessment provide the subject of this report.

In considering the level at which the minimum unit price should be set, the Scottish Government has relied upon evidence from the University of Sheffield. Specifically, the Government states that:

> *"Because this is a new policy, the Scottish Government commissioned the University of Sheffield to model the impact of the introduction of a Minimum Unit Price. Four reports were published between 2009 and 2016. The modelling has consistently shown that Minimum Unit Pricing will have most impact on those who drink the most alcohol."*
>
> *"Alcohol-related harm is experienced more in disadvantaged communities. The modelling also looked at the impact on those on low incomes compared with others. It showed that Minimum Unit Pricing has the greatest benefits where harm is greatest"*

Cebr is concerned that the Scottish Government is relying on out-of-date and inadequate appraisals of the impacts of a blanket 50p MUP. The Sheffield University appraisals assess how the various positive and negative impacts of the policy are expected to differ under different levels of MUP, from 30p to 70p in 10p increments. However, the last appraisal by the University of Sheffield was carried out over the period from late 2015 to early 2016 and the most up-to-date data available at that time was for 2014. It is now 2018 and the latest available data is for 2016, with some data starting to emerge for 2017.

The results of the latest Sheffield University appraisal can effectively, therefore, be equated with the Scottish Government's justification for its stated preference for a flat 50p MUP to be applied to all alcohol beverages. But if this appraisal is out-of-date, it raises the question whether the Scottish Government can be confident that a blanket 50p MUP is in fact proportionate. A fundamental part of

setting the minimum unit price level is to ensure that the policy is sufficiently targeted to meet the stated policy objective – to reduce the harm being caused by the excessive consumption of cheap, strong alcoholic beverages.

However, not only are the Sheffield University appraisals out-of-date, but Cebr has fundamental issues with the methods and underlying assumptions used in those appraisals. We maintain the view that the Sheffield University work has the potential to significantly exaggerate the benefits of the policy, whilst providing a wholly inadequate treatment of the regressive re-distributional implications of a blanket MUP set at 50p or at any other level.

1.2 Overview of this report

We begin our analysis by outlining how using more up-to-date baseline data (the assumed starting point of the policy for economic modelling purposes) and changing the underlying modelling assumptions sheds new light on the likely effectiveness of a blanket 50p MUP policy. We then provide what we consider to be a more representative examination of the regressive re-distributional impacts of a blanket 50p MUP. We consider this in the context of drinkers in poverty and not in poverty, as is Sheffield University's approach, but we also go beyond that to consider:

- Impacts at the income decile level; and
- Impacts on a more representative notion of the re-distributional consequences of MUP, that is, consumer welfare, which goes beyond just affordability to also consider standard of living and equality.

All of the evidence points to a blanket 50p MUP being highly regressive in its re-distributional consequences, with the negative consumer welfare impacts falling disproportionately on the poorest in society – those living in poverty, generally associated with the bottom two income deciles. However, the policy is also shown to be highly regressive for consumers in the third income decile and even in the fourth, with comparatively little impacts on those in the highest income deciles.

Given this analysis, we think there are serious doubts about the proportionality of a blanket 50p MUP. For that reason, we have also modelled an alternative scheme, based on a banded MUP system, where higher MUPs would apply to the highest ABV beverages. An assessment of this scheme against the blanket 50p option reveals a policy that is equally effective in meeting the stated objectives of the policy – reducing alcohol consumption, especially to harmful levels through the availability of strong products that are excessively cheap – but is significantly less regressive in re-distributional terms.

1.3 Cebr's approach and methodology

In preparing our assessment of the proportionality of a blanket 50p MUP, it was important to accept that the information and datasets that are available to Sheffield University are far superior to anything Cebr can gain access to, as they have not been made available for public review. For that reason, Cebr has constructed a model that mirrors the workings of the Sheffield University Alcohol Policy Model in a way that overcomes the comparative lack of data available to Cebr. The model was then calibrated to the Sheffield University estimates of the impact of a flat 50p MUP. This ensured that Cebr's model was adjusted to take account of the differences arising from the inferior granularity of the data available to Cebr.

Having done this, we were able to model alternative baseline starting points – reflecting not only the most up-to-date data for 2014, but also that for 2016. This reveals a less impactful policy across all drinker groups and all income levels. It is reasonable to conclude, therefore, that Sheffield University's

predictions of the impact of a 50p MUP on alcohol consumption are overestimates and, therefore, potentially exaggerated in the context of more accurate and up-to-date 2016 data that reflects an altered landscape and a new starting baseline.

This raises questions as to why the Scottish Government has not had Sheffield University carry out a new appraisal to ensure that a 50p MUP still produces the results that are now the basis for the Scottish Government's conclusion that this is a proportionate policy to meet the stated objective.

This is vital. If the policy is expected to produce less of an impact on alcohol consumption than was appraised by Sheffield University, then it can also be expected to deliver less of the health-related benefits that are purported to be the key social benefit of the policy. But if the expected health-related benefits from a 50p MUP are exaggerated in the latest appraisal, the conclusion of the Scottish Government that 50p is the proportionate level cannot be said to be based on unbiased evidence. The negative implications of any policy will look less detrimental if the benefits are exaggerated. Likewise, the negative implications will look far more detrimental if the benefits can be shown to be exaggerated and by how much they need to be reduced to eliminate the bias.

We have also examined the underlying behavioural assumptions that drive the estimates of reduced alcohol consumption seen in the Sheffield University appraisals. The presumption is that minimum unit pricing, by increasing the cost of alcohol, means people will drink less and, if people drink less, then there will be less health-related and other harms caused by alcohol. But the evidence supporting this proposition is underpinned by an assumption that all drinkers will respond to the 50p MUP by reducing their alcohol consumption and that all drinkers will do so in a uniform manner.

This is fundamentally flawed, but is the basis for the Sheffield University appraisals. A uniform response is highly unlikely and any estimates of the benefits of a 50p MUP made on the basis of this highly simplifying assumption must be treated with extreme caution because they are more than likely going to be exaggerated. This provides further basis for questioning the robustness of the appraisal evidence on which the Government has based its conclusion that a flat 50p MUP is the correct and proportionate policy response to tackle the stated objective of reducing the harms associated with the excessive consumption of cheap, strong alcohol.

We also consider the failure of the Sheffield University appraisals to take account of some of the key potential unintended consequences of a minimum unit pricing policy, including switching to cross-border trade if there is asymmetry in policy between Scotland and other parts of the UK or switching to the illicit trade.

We go on to consider the negative distributional consequences of a flat 50p MUP policy. The Sheffield University appraisals cannot be thought of as providing an adequate consideration of the regressive distributional implications of the policy in monetary and financial terms. It only deals with whether consumers will spend more or less on alcohol once the policy is introduced. But this is bound to paint a favourable picture of the impacts of a flat 50p MUP. It only tells us how much more or less people spend on alcohol per annum *after* taking account of the price increases that will result from MUP and the expected demand responses – the projected reductions in the number of alcohol units consumed. These results say absolutely nothing about:

- How much more consumers will have to pay for the alcohol that they do continue to consume; or
- What value they lose in terms of the erosion of their standard of living or the financial hardship that it could impose on the families of problem drinkers who do not reduce their consumption.

For the general population, the vast majority of which are non-problem drinkers, the higher alcohol prices that will result from a 50p MUP can be expected to have a negative impact by raising their cost of living and reducing their living standards and the potential for this to exacerbate inequality.

However, we have also assessed the alternative idea, put forward by Molson Coors, of a banded MUP system based on the strength of alcoholic beverage concerned. Higher MUPs would apply to higher ABV products and lower MUPs to lower ABV products. We show how this idea has economic merit, performs well in terms of reducing overall alcohol consumption and the over-consumption of cheap, strong products, but is also superior than the flat 50p MUP on socioeconomic grounds. Specifically, the banded MUP system is far less regressive in its re-distributional consequences than a flat 50p MUP.

1.4 Structure of the report

The remainder of this report is structured as follows:

- **Section 2** sets out the manner in which the landscape has altered and the implications of this for the baseline in any model that seeks to estimate the impacts of MUP.
- **Section 3** demonstrates how the Sheffield University appraisals are built on weak foundations that are most likely to lead to exaggerated estimates of the benefits of a flat 50p MUP.
- **Section 4** considers the regressive re-distributional consequences of a flat 50p MUP, demonstrating how a disproportionate burden of the policy would fall upon the poorest in society and how those in the bottom four income deciles would see the greatest impact on both their cost and standard of living.
- **Section 5** assesses performance of the alternative ABV-banded MUP system, demonstrating equal effectiveness with a flat 50p in terms of the stated objectives of the policy of reducing alcohol consumption and the health and other harms associated with the excessive intake of alcohol. But we also demonstrate how the banded system is likely to be superior on re-distributional grounds in being far less regressive than the flat 50p option.

2 Altered landscape and a new model baseline

Relying on the Sheffield University analysis of a 50p MUP, the Scottish Government has asserted the expected outcomes from the policy. However, some of the expected outcomes are not necessarily supported under the new baseline model.

This section considers the manner in which the landscape has altered in Scotland and the fact that these alterations are likely to change the results of the Sheffield University (SU) appraisals. We reveal how any movement to a more accurate up-to-date baseline means a less impactful policy across all drinker groups and all income levels. It is likely, therefore, that Sheffield University's predictions of the impact of a flat 50p MUP on alcohol consumption are overestimates and, therefore, potentially exaggerated in the context of more accurate and up-to-date 2016 data that reflects an altered landscape and a new starting baseline.

2.1 Changes in population and drinker groups

The Sheffield University (SU) analysis divides the population into abstainers and three drinker groups:

- *Moderate drinkers*: those whose usual alcohol intake is no more than 14 units per week (where one unit = 8g ethanol);
- *Hazardous drinkers*: those drinkers consuming 14-35 units per week; and
- *Harmful drinkers*: drinkers whose usual weekly intake exceeds 35 units.

Table 10 below shows the assumptions adopted by Sheffield University for the breakdown of the adult population (aged 16+ years) in its 2014 baseline year. The table also shows data for 2013 and 2014, taken from the latest Scottish Health Survey (SHeS), which now includes data up to 2016. Retrospective revisions in national datasets are common, but the latest data show the share of abstainers in the Scottish population was 0.8 percentage points higher in 2014 than assumed by Sheffield University.

Table 10: Breakdown of Scottish population into abstainers and drinker groups, SU 2014 assumptions vs. up-to-data for 2014 and 2013

Population group	SU assum. % adult population 2014	SHeS 2016 data % adult population 2014	SHeS 2016 data % adult population 2013
Abstainers	14.9%	15.7%	Not available
Moderate	60.5%	58.8%	Not available
Hazardous	19.1%	25.5%	24.5%
Harmful	5.4%		
Hazardous + Harmful	**24.5%**	**25.5%**	**24.5%**

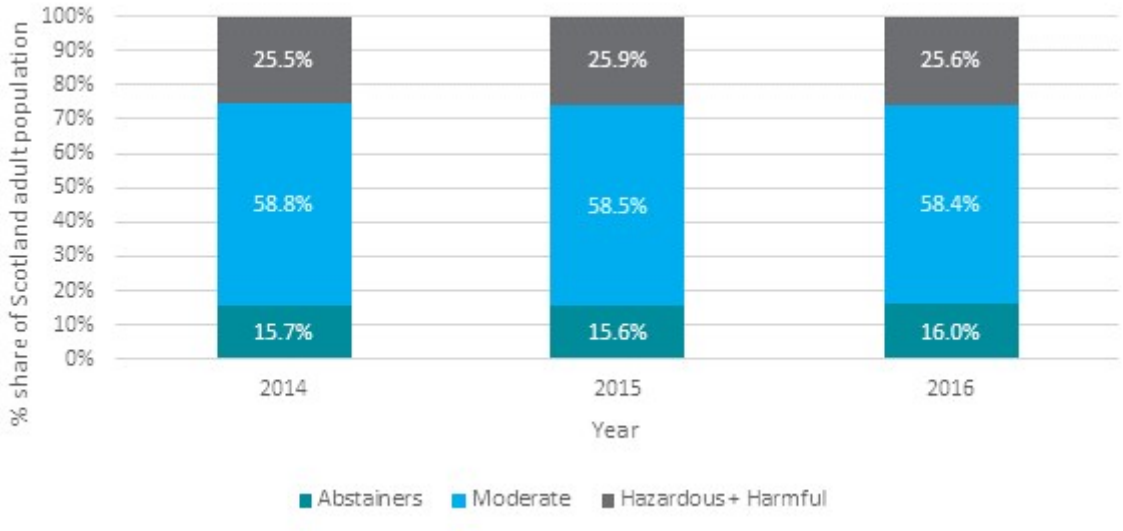
Source: SHeS (2016). Sheffield Uni. (2016)

The latest data also suggest, however, that the share of the Scottish population drinking to hazardous and harmful levels was higher than statistics at the time suggested and assumed in the SU appraisal –

25.5% compared to SU's assumption of 24.5%.[1] (In fact, the 2014 baseline assumption adopted for the SU appraisal is more akin with the data posted for 2013 in the latest SHeS release, as shown in the last column of Table 10.)

Figure 1 illustrates how the situation has altered since, with the revised 2014 data sitting alongside the equivalent breakdowns in 2015 and 2016. While the share of abstainers in the population dropped slightly in 2015, the data for 2016 suggests that it has increased by 0.3 percentage points since 2014. Meanwhile the proportion of the population drinking at hazardous and harmful levels increased in 2015 but receded in 2016 and remains 0.1 percentage points higher than in 2014.

Figure 1: Breakdown of Scottish population into abstainers and drinker groups, 2014-2016



Source: SHeS (2016), Cebr analysis

In order to appraise the SU study, a number of comparisons between the SU baseline assumptions and what the latest data suggests would be the appropriate baseline today are necessary. In respect of the overall drinker population and each of the two main drinker groups, this is summarised in Table 11 below, which tells us the following (based on changes in the Scottish population and the changes illustrated in Figure 1 above):

- The SU baseline drinker population is overestimated by 1,570 adults relative to actual 2014 data, but its combined hazardous and harmful sub-population was under-stated by over 49,000 adults. The moderate drinker population was thus overstated by almost 51,000 adults.
- Relative to 2016, the SU baseline assumptions includes a 32,000 understatement of the entire drinker population and a 69,000 understatement of the hazardous and harmful drinking population. As a result, the moderate drinker population was overstated by 36,600 in the SU baseline.

[1] The latest data reflect the application of the same hazardous and harmful drinking guidelines for males and females in terms of units consumed. SU's assumption was based on data that was still recorded based on lower guideline consumption levels for females than males.

Table 11: Changes in the size of drinker population and sub-groups in Scotland, SU 2014 vs. 2014 & 2016 actuals

Population group	SU 2014 vs. Actual 2014	SU 2014 vs. Actual 2016
Moderate	50,943	36,640
Hazardous + Harmful	- 49,373	- 68,889
Implied drinker population	1,570	- 32,249

Source: SHeS (2016). Sheffield Uni. (2016), Cebr analysis

But we note that most of the difference between SU's 2014 baseline and what would be the baseline today (2016) is accounted for by the discrepancies between the SU assumptions for 2014 and the 2014 actuals.

If annual alcohol sales volumes (which have declined in Scotland since 2014) are a good indicator for annual alcohol consumption – arguably a reasonable assumption – then:

- The overstatement of the moderate drinker population can be expected to have resulted in SU understating the baseline average (or mean) levels of alcohol consumption of moderate drinkers; and
- The understatement of the hazardous and harmful drinker population can be expected to have resulted in SU overstating the baseline average levels of alcohol consumption of hazardous and harmful drinkers.

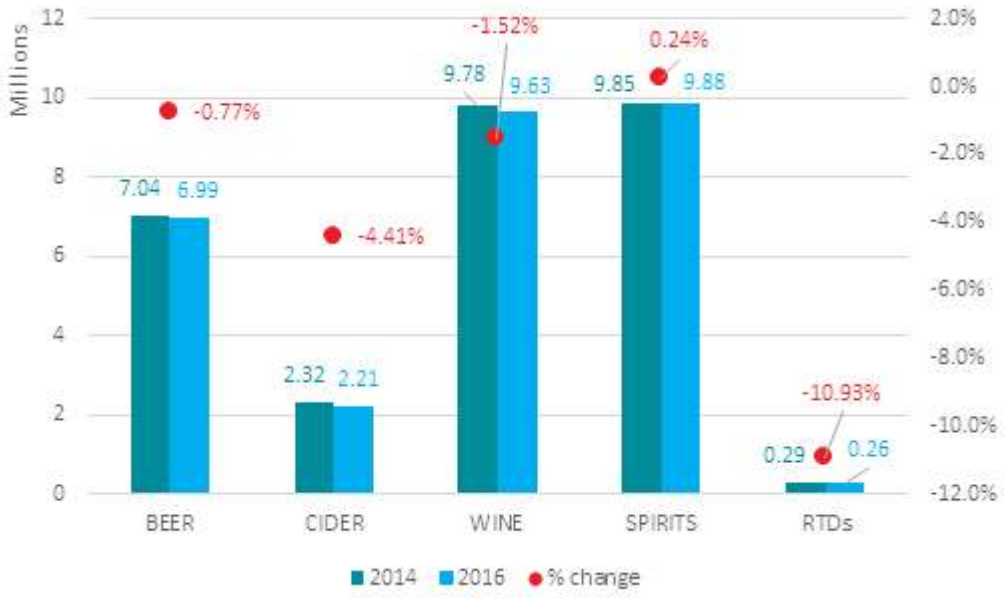
This alone, as demonstrated below, significantly dilutes the Sheffield University predictions of the impacts of MUP in Scotland. The extent to which the SU results are potentially exaggerated is presented later in this section.

2.2 Changes in alcohol sales volumes and prices

The latest available data reveal an overall 0.7% decline in off-trade alcohol sales, when measured in terms of litres of pure alcohol, between 2014 and 2016. (Cebr does not have access to on-trade data and has, therefore, had to ignore this part of the market, which is in any case, unlikely to be significantly impacted by an MUP policy.)

Figure 2 illustrates changes within the five main beverage categories, with the bars showing the number of litres (of pure alcohol) sold in the off-trade in 2014 and 2016 and the red markers indicating the percentage change over the two years within each category. Declines have been observed in most categories, with the largest decline in ready-to-drinks (RTDs) and the smallest decline in beer. Spirits was the only main beverage category to report growth.

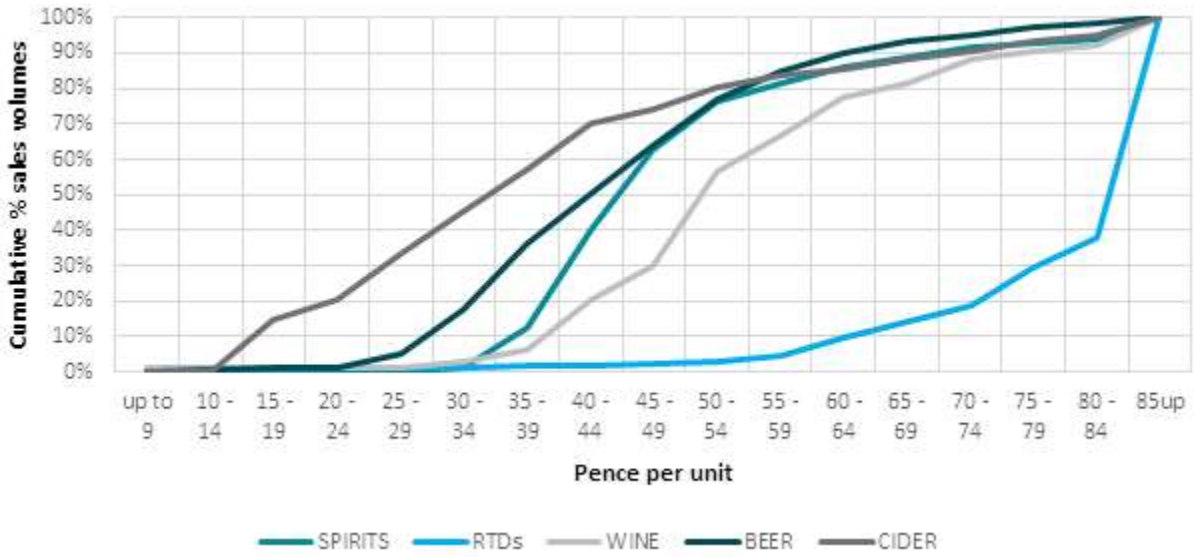
Figure 2: Sales volumes in each of the five main alcohol beverage categories, off-trade



Source: NHS Health Scotland (Nielsen), Cebr analysis

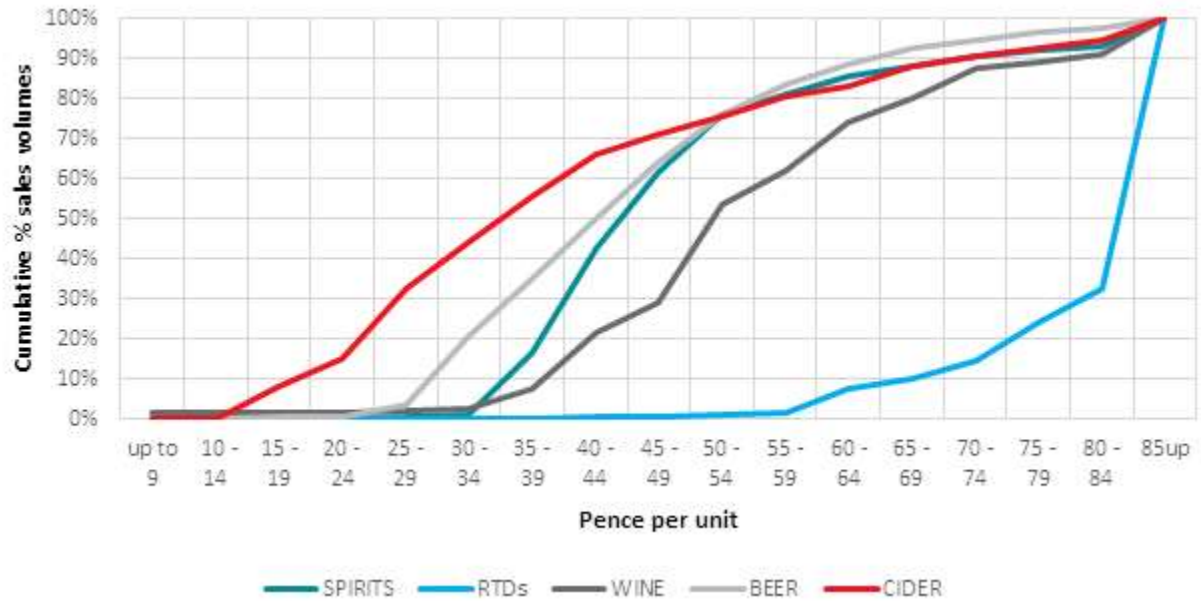
Price distributions, akin to those used in the SU appraisal, are reproduced for each of 2014 and 2016 below. These are based on off-trade sales data from The Nielsen Company and published by NHS Health Scotland. The datasets provide the cumulative volumes of alcohol sold by the time each price band is reached, starting at 0-9 pence per unit then increasing in 5 pence increments. By the time 85 pence and upwards (85up) is reached, 100% of the volumes are accounted for.

Figure 3: Price distributions of the five main beverage categories, off-trade 2014



Source: NHS Health Scotland

Figure 4: Price distributions of the five main beverage categories, off-trade, 2016



Source: NHS Health Scotland

We note that the 2014 price distributions in Figure 3 and

Figure 4 are not directly comparable with those featured in the SU appraisal. The latter takes is price distributions from an analysis of data from the Living Costs and Food Survey, acquired as a result of a special data request to the Department for the Environment, Food and Rural Affairs (Defra), which were then adjusted based on the Nielsen data featured in Figure 3.

From the price distributions shown can be read the percentage of sales volumes being made above or below a certain price. As such, Table 12 shows how the percentage share of sales of each beverage category being sold below 50p has changed between 2014 and 2016. The 2014 baseline assumptions underlying the SU appraisal are shown in the "SU 2014" column.

Table 12: % share of sales volumes sold for less than 50 pence per unit

Beverage category	SU 2014	2014	2015	2016
Spirits	63.0%	62.8%	61.7%	61.8%
RTDs	n/a	2.5%	1.0%	0.4%
Wine	30.0%	29.9%	29.0%	29.2%
Beer	64.0%	64.0%	64.0%	64.2%
Cider	74.0%	74.2%	73.8%	71.1%
Overall	**n/a**	**52.2%**	**51.5%**	**51.3%**

Source: NHS Health Scotland

There is a close correspondence between the SU baseline assumptions and what the market data suggest about the proportions of sales below £0.50 per unit in 2014, as suggested by a comparison between the 'SU 2014' column and the 2014 (actual) column.

More important, however, are the changes observable between 2014 and 2016, which suggest:

- The proportion of spirits being sold at less than £0.50 per unit is down 1 percentage point – from 62.8% in 2014 to 61.8% in 2016
- The proportion of wine being sold below the proposed MUP of 50 pence is down about 0.7 percentage points – from 29.9% to 29.2%
- There is little to no discernible change in the share of beer being sold below £0.50 and, if anything, it has grown slightly
- The share of cider being sold at less than £0.50 per unit shows a 3.1 percentage point reduction – from 74.2% in 2014 to 71.1% in 2016.

Given that smaller shares of off-trade alcohol are now being sold at prices below the currently proposed 50p MUP, the introduction of such a policy can be expected to be less impactful than that estimated by Sheffield University based on 2014 data.

2.3 Changes in the socioeconomic profile of Scottish drinkers

SU also subdivides the Scottish drinker population and drinker groups according to whether they can be considered 'in poverty' or 'not in poverty', where poverty is defined as *"an equivalised household income below 60% of the population median"*.

Table 13 shows SU's baseline assumptions in terms of these subdivisions. The lion's share of the drinker population (62%) was assumed to be moderate drinkers and not in poverty, as would be expected. Hazardous and harmful drinkers that are not in poverty were assumed to make up 26% of the population. Those living in poverty and drinking to moderate, hazardous and harmful levels each make up, respectively, 9%, 2% and 1% of the drinker population.

Table 13: Socioeconomic profile of drinker population and groups, SU 2014 assumptions

	Moderate		Hazardous		Harmful		TOTAL	
2014-SU	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
Drinker population	345,308	2,314,021	83,404	758,402	31,248	208,089	459,960	3,280,512
% of total drinkers	9.00%	62.00%	2.00%	20.00%	1.00%	6.00%	12.00%	88.00%

Source: Sheffield University - latest appraisal of MUP in Scotland

Table 14 shows Cebr's reading of the most up-to-date data for 2014 from the Scottish Health Survey (SHeS). This suggests that a greater share of the drinker population was in poverty than suggested by SU (almost 16% vs. SU's 12%). Given this, our estimates also suggest that higher shares of each of the drinker groups were in poverty in 2014.

Table 14: Socioeconomic profile of drinker population and groups, Cebr analysis of up-to-date data for 2014

	Moderate		Hazardous		Harmful		TOTAL	
2014-Act	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
Drinker population	445,848	2,218,446	107,688	727,078	40,346	199,494	593,882	3,145,019
% of total drinkers	11.92%	59.33%	2.88%	19.45%	1.08%	5.34%	15.88%	84.12%

Source: SHeS (2014), Cebr analysis

Table 15 provides Cebr's assessment of the latest SHeS data for 2016, the appropriate baseline year for an assessment of the policy today given the available data. This still suggests higher shares of the drinker population and groups are in poverty than assumed by SU for 2014. The comparison between 2016 and the 2014 actuals reveals marginally smaller rates of poverty in all of the drinker groups.

Table 15: Socioeconomic profile of drinker population and groups, Cebr analysis of 2016 data

	Moderate		Hazardous		Harmful		TOTAL	
2016-Act-SUDG	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
Drinker population	425,170	2,261,731	102,693	741,264	38,475	203,387	566,338	3,206,382
% of total drinkers	11.27%	59.95%	2.72%	19.65%	1.02%	5.39%	15.01%	84.99%

Source: SHeS (2016), Cebr analysis

As with the estimates of the drinker group sub-populations, the changes in the baseline socioeconomic profile of the Scottish drinker population can likewise be expected to impact on SU's baseline estimates of the mean alcohol consumption levels of those in poverty compared to those not in poverty. This will likewise have implications in terms of the anticipated magnitude of the impacts of MUP on their drinking behaviour. This is explored further below.

2.4 Implications for baseline alcohol consumption and spending

Table 16 shows SU's baseline assumptions for 2014 of mean annual alcohol consumption (units per drinker) and mean annual spending on alcohol in each of the drinker groups. (The drinker population data from Table 13 to Table 15 are re-presented for ease of reference.)

The table shows that SU, for example, assumed that moderate drinkers in poverty consume 238 units per year on average and spend £230 to do so. Hazardous and harmful drinkers in poverty were each assumed to consume more on average than, respectively, average hazardous or harmful drinkers not in poverty. Harmful drinkers in poverty are assumed to spend more on alcohol – meaning that the higher number of units they consume relative to harmful drinkers not in poverty is, according to SU's analysis, significant enough to outweigh the fact that they would be expected to seek out cheaper alcohol.

Table 16: Annual average alcohol consumption (units) and spending (£), by drinker group and poverty levels, SU baseline

	Moderate		Hazardous		Harmful	
2014-SU	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
Drinker population	345,308	2,314,021	83,404	758,402	31,248	208,089
% of total drinkers	9.00%	62.00%	2.00%	20.00%	1.00%	6.00%
Mean annual alcohol consumption	238	323	1,456	1,396	4,499	3,348
Mean annual alcohol spending	£ 230	£ 378	£ 1,102	£ 1,204	£ 2,484	£ 2,341

Source: Sheffield University - latest appraisal of MUP in Scotland

Table 17 shows the equivalent data for the overall drinker population and each of the main drinker groups as a whole.

Table 17: Annual average alcohol consumption (units) and spending (£), by drinker group, SU baseline

2014-SU	Population	Moderate	Hazardous	Harmful
Drinker population	3,740,472	2,659,329	841,805	239,337
% of total drinkers	100.00%	71.00%	23.00%	6.00%
Mean annual alcohol consumption	761	312	1,402	3,498
Mean annual alcohol spending	£ 675	£ 359	£ 1,194	£ 2,360

Source: Sheffield University - latest appraisal of MUP in Scotland

Table 18 shows how the assumptions in Table 16 would change if the most up-to-date data on the drinker population and drinker groups for 2014 are used instead. This suggests that SU systematically overestimates mean alcohol consumption levels for those in poverty in all drinker groups. Consequently, it also underestimates mean consumption levels of those in poverty. Likewise, average annual spend on alcohol is likewise over-stated by SU for those in poverty and understated for those not in poverty.

Table 18: Annual average alcohol consumption (units) and spending (£), by drinker group and poverty levels, 2014 updated

	Moderate		Hazardous		Harmful	
2014-Act	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
Drinker population	445,848	2,218,446	107,688	727,078	40,346	199,494
% of total drinkers	11.92%	59.33%	2.88%	19.45%	1.08%	5.34%
Mean annual alcohol consumption	184	337	1,128	1,456	3,484	3,492
Mean annual alcohol spending	£ 178	£ 394	£ 853	£ 1,256	£ 1,924	£ 2,442

Source: SHeS (2016), Cebr analysis

Table 19 shows the equivalent data for the whole drinker population and each of the drinker groups as a whole. Comparing this with Table 17 demonstrates that over-stating the moderate drinker group population and under-stating the hazardous and harmful population means overstated average levels of consumption and spending for moderate drinkers and understated mean levels for hazardous and harmful drinkers. Note that there are no changes at the overall drinker population level between the SU-2014 baseline and the alternative 2014 baseline developed using more up-to-date data.

Table 19: Annual average alcohol consumption (units) and spending (£), by drinker group, 2014 updated

2014-Act	Population	Moderate	Hazardous	Harmful
Drinker population	3,738,901	2,608,386	880,248	250,267
% of total drinkers	100.00%	69.76%	23.54%	6.69%
Mean annual alcohol consumption	761	318	1,341	3,345
Mean annual alcohol spending	£ 675	£ 366	£ 1,142	£ 2,257

Source: SHeS (2014), Cebr analysis

The following tables show the implications of switching to a 2016 baseline. Two potential 2016 baselines are presented:

- *2016-Act-SUDG*: this uses the SU 2014 baseline assumptions on how mean consumption amongst each of the drinker groups varies from mean consumption amongst the drinker population as a whole. The results are shown in Table 20 and Table 21.
- *2016-Act-CebrDG*: this uses the baseline assumptions on divergence in mean consumption between the drinker groups and the overall drinker population developed using the most up-to-date data for 2014. The results are shown in Table 22 and Table 23.

The shift to a 2016 baseline, which incorporates all of the changes outlined so far, results in lower mean alcohol consumption and lower average spend than in the 2014 baselines across the drinker population as a whole, with no change between the alternative 2016 scenarios.

Table 20: Annual average alcohol consumption (units) and spending (£), by drinker group, 2016 baseline, SU drinker group assumptions

2016-Act-SUDG	Population	Moderate	Hazardous	Harmful
Drinker population	3,772,720	2,622,689	895,444	254,587
% of total drinkers	100.00%	69.52%	23.73%	6.75%
Mean annual alcohol consumption	749	307	1,381	3,445
Mean annual alcohol spending	£ 665	£ 354	£ 1,176	£ 2,324

Source: SHeS (2016), Cebr analysis

Table 21: Annual average alcohol consumption (units) and spending (£), by drinker group and poverty levels, 2016 baseline, SU drinker group assumptions

	Moderate		Hazardous		Harmful	
2016-Act-SUDG	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
Drinker population	425,170	2,261,731	102,693	741,264	38,475	203,387
% of total drinkers	11.27%	59.95%	2.72%	19.65%	1.02%	5.39%
Mean annual alcohol consumption	182	311	1,200	1,449	3,707	3,475
Mean annual alcohol spending	£ 177	£ 366	£ 914	£ 1,258	£ 2,061	£ 2,447

Source: SHeS (2016), Cebr analysis

Because the *2016-Act-CebrDG* baseline scenario builds on Cebr's analysis of the most up-to-date actual data for both 2014 and 2016, it is appropriate to focus on the outcomes in Table 22 and Table 23 to understand the implications for the individual drinker groups. The appropriate comparison is between these tables and the SU-2014 baseline assumptions in Table 16 and Table 17 above.

Table 22: Annual average alcohol consumption (units) and spending (£), by drinker group, 2016 baseline, Cebr drinker group assumptions

2016-Act-CebrDG	Population	Moderate	Hazardous	Harmful
Drinker population	3,772,720	2,622,689	895,444	254,587
% of total drinkers	100.00%	69.52%	23.73%	6.75%
Mean annual alcohol consumption	749	313	1,320	3,293
Mean annual alcohol spending	£ 665	£ 360	£ 1,124	£ 2,221

Source: SHeS (2016), Cebr analysis

There are more significant changes at the individual drinker group level but, in general, average levels of alcohol consumption amongst the heavier drinkers in the Scottish population are certainly over-stated by SU relative to what is suggested by a shift to a 2016 baseline, with the one exception being hazardous drinkers not in poverty.

Table 23: Annual average alcohol consumption (units) and spending (£), by drinker group and poverty levels, 2016 baseline, Cebr drinker group assumptions

	Moderate		Hazardous		Harmful	
2016-Act-CebrDG	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
Drinker population	425,170	2,261,731	102,693	741,264	38,475	203,387
% of total drinkers	11.27%	59.95%	2.72%	19.65%	1.02%	5.39%
Mean annual alcohol consumption	190	325	1,178	1,423	3,640	3,413
Mean annual alcohol spending	£ 184	£ 382	£ 893	£ 1,229	£ 2,013	£ 2,390

Source: SHeS (2016), Cebr analysis

The fact that baseline levels of alcohol consumption amongst the heaviest Scottish drinkers are over-stated means the SU predictions of the impacts of MUP in Scotland can be expected to be significantly diluted. The extent to which the SU results are now exaggerated is presented in the following subsection.

2.5 Effect of an altered baseline on the predicted impacts of a 50p MUP

Probably the most important predictions made by the University of Sheffield, on behalf of the Scottish Government, are of how a minimum unit pricing policy would reduce average levels of alcohol consumption. It is these estimates that drive the purported magnitudes of the health-related benefits of the policy – reduced alcohol-related deaths and alcohol-related hospitalisations. This makes sense.

But a MUP policy that is less impactful in terms of reducing levels of alcohol consumption can also be expected to be less effective in reducing alcohol-related deaths and hospitalisations.

Table 24 demonstrates our findings. The first row shows the Sheffield University results (the original SU baseline) - the estimated impact of a 50p MUP in terms of reducing average levels of alcohol consumption (measured in units). The other three rows show the impacts that Cebr believes would be estimated by the Sheffield University model if it was to change its baseline assumptions.

Using better 2014 data reveals a policy that would be expected to be marginally more impactful amongst hazardous and harmful drinkers who are not in poverty, but significantly less impactful on the same drinker types who live in poverty.

Table 24: Effects of a 50p MUP on alcohol consumption, Sheffield University elasticities

Change in number of units of alcohol consumed by drinker type and income status							
50p MUP		Moderate		Hazardous		Harmful	
Baseline	Description	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
2014-SU	Original SU 2014 baseline	-10	-3	-88	-30	-681	-181
2014-Act	2014 baseline based on updated data	-8	-3	-68	-31	-528	-189
2016-Act-SUDG	2016 with SU drinker group assum.	-7	-2	-69	-29	-525	-175
2016-Act-CebrD	2016 with Cebr drinker group assum.	-7	-3	-68	-29	-515	-172

Source: Sheffield University - latest appraisal of MUP in Scotland

Moving to either of the 2016 baselines also reveals a potentially less impactful policy across all drinker groups and all income levels. It is reasonable to conclude, therefore, that Sheffield University's predictions of the impact of a 50p MUP on alcohol consumption are exaggerated in the context of more accurate and up-to-date 2016 data that reflects an altered landscape and a new starting baseline.

This raises questions as to why the Scottish Government has not had Sheffield University carry out a new appraisal to ensure that a flat 50p MUP still produces the results that are now the basis for the Scottish Government's conclusion that this is a proportionate and sufficiently targeted policy to meet the stated objectives.

This is vital. If the policy is expected to produce less of an impact on alcohol consumption than was appraised by Sheffield University, then it can also be expected to deliver less of the health-related benefits that are purported to be the key social benefit of the policy. But if the expected health-related benefits from a 50p MUP are exaggerated in the latest appraisal, the conclusion of the Scottish Government that 50p is the correct or proportionate level cannot be said to be based on unbiased evidence.

The negative implications of any policy will look less detrimental if the benefits are exaggerated. Likewise, the negative implications will look much more detrimental if the benefits can be shown to be exaggerated and by how much they need to be reduced to eliminate the bias.

3 Evidence built on flawed assumptions driving exaggerated benefits

This section considers the evidence that suggests that the Sheffield University appraisals are built on weak foundations that are likely to lead to exaggerated estimates of the benefits of a flat 50p MUP.

3.1 Flawed assumptions around drinker behaviour

Driving any estimates of the impact of a MUP policy for alcohol are the underlying behavioural assumptions for drinkers – that is, how they can be expected to respond to the policy. The presumption is that minimum unit pricing, by increasing the cost of alcohol, means people will drink less and, if people drink less, then there will be less health-related and other harms caused by alcohol. But the evidence supporting this proposition is underpinned by an assumption that all drinkers will respond to the 50p MUP by reducing their alcohol consumption and that all drinkers will do so in a uniform manner.

This is fundamentally flawed,[2] but is the basis for the Sheffield University appraisal. A uniform response is highly unlikely and any estimates of the benefits of a 50p MUP made on the basis of this highly simplifying assumption must be treated with caution because they are more than likely going to be exaggerated.

But there is also the question of the robustness of the demand elasticity estimates used by Sheffield University in its most recent appraisal of MUP in Scotland (and elsewhere). These were produced by Sheffield University itself and, having reviewed the academic report on how they did so, we have good reason to believe that several of the estimates may be counterintuitive in economic terms. (These and other concerns are outlined in more detail in the Appendix.)

So, not only is there the questionable assumption about common elasticities applying to all types of drinker, we also have a questionable set of elasticity estimates underpinning the evidence being used by the Scottish Government to decide on a 50p MUP.

3.2 Effect of altered assumptions on the predicted impacts of MUP

Cebr has equipped its model to reproduce the estimates that the Sheffield University model would produce under alternative elasticity assumptions. This has been done is two ways:

- First, HMRC has been estimating demand elasticities for alcohol as part alcohol taxation policymaking for years. It is not unreasonable to conclude that HMRC's estimates are likely to be more robust than Sheffield University's, given the concerns outlined in the Appendix. One might even say that there was little point in Sheffield University undertaking the exercise it did unless it sought to build on the HMRC estimates by examining the question of whether different types of drinker respond to price changes at different rates and in different ways. Nonetheless, the effect of

[2] Logic itself suggests that problem drinkers can be expected to be less likely to respond to price changes than sensible drinkers. A problem drinker will want to continue to drink whatever the price – it is all about maintaining their levels of alcohol consumption. Moderate sensible drinkers are not so concerned with maintaining their levels of alcohol consumption and so can be expected to be more sensitive to price changes. In economics, the responsiveness of demand to price changes is measured by the elasticity of demand. It is reflected in a ratio that measures the percentage reduction in demand for a product in response to a 1% change in its price. The logic above means that problem drinkers would be expected to have a lower elasticity of demand for alcohol because the extent to which they are inclined to reduce their consumption in response to an increase in price is likely to be less than in the case of the more sensible drinker.

switching to HMRC's elasticity assumptions on Sheffield University's projected reductions in alcohol consumption as a result of a flat 50p MUP can be understood by comparing the table below with Table 24 above (which is based on Sheffield University elasticities). As can be seen, the HMRC elasticities suggest a more impactful policy on all hazardous and harmful drinking groups – those in poverty and not in poverty. But the impacts under the altered baselines are still lower than the impacts projected by Sheffield University under its 2014 assumptions. This evidence lends further support to the proposition that the impacts in the Sheffield University appraisal are overstated and do not provide a robust basis for deciding whether a flat 50p MUP is proportionate.

Table 25: Effects of a 50p MUP on alcohol consumption, HMRC elasticities

Change in number of units of alcohol consumed by drinker type and income status						
50p MUP	Moderate		Hazardous		Harmful	
Baseline	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
2014-SU	- 12	- 3	- 106	- 36	- 709	- 188
2014-Act	- 8	- 3	- 72	- 33	- 557	- 199
2016-Act-SUDG	- 9	- 3	- 91	- 39	- 595	- 199
2016-Act-CebrDG	- 10	- 3	- 89	- 38	- 585	- 195

Source: Cebr analysis

- Second, Cebr has always contended that hazardous and harmful drinkers can be expected to have lower demand responsiveness to price changes and that the demand elasticity assumptions underlying the appraisal of MUP should be adjusted accordingly. The impact of doing this is shown in Table 26, which can again be compared with the previous two tables. This shows what Cebr's model predicts Sheffield University would estimate as the impact of a flat 50p MUP under these altered demand elasticity assumptions, again under each of the alternative baselines. It can be clearly seen, especially under the 2016 baselines, that the expected impacts of a 50p MUP are significantly reduced for hazardous and harmful drinkers, especially those in poverty, but marginally increased for moderate drinkers. This suggests that any level of MUP, including the Scottish Government's intended 50p, can be expected to have a more significant impact on moderate drinkers and a less significant impact on hazardous and harmful drinkers than is suggested by the Sheffield University appraisal. This is yet further evidence supporting the proposition that the impacts in the Sheffield University appraisal are overstated and do not provide a robust basis for deciding whether a 50p MUP is proportionate.

Table 26: Effects of a 50p MUP on alcohol consumption, Cebr elasticities

Change in number of units of alcohol consumed by drinker type and income status						
50p MUP	Moderate		Hazardous		Harmful	
Scenario	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
2014-SU	- 18	- 5	- 75	- 25	- 566	- 150
2014-Act	- 14	- 5	- 58	- 27	- 438	- 157
2016-Act-SUDG	- 14	- 5	- 63	- 27	- 461	- 154
2016-Act-CebrDG	- 15	- 5	- 62	- 26	- 453	- 151

Source: Cebr analysis

Given that the flat 50p MUP policy is expected to be less impactful than is predicted in the latest appraisal conducted on behalf of the Scottish Government in reducing alcohol consumption, it can also be expected to be less effective in reducing alcohol-related deaths and hospitalisations.

It is reasonable to conclude again, therefore, that Sheffield University's predictions of the impact of a 50p MUP on alcohol consumption and alcohol-related health harms are exaggerated, not only in the context of more accurate and up-to-date data, but also in the context of the underlying behavioural assumptions on drinkers that are driving those estimates. Again, this raises the question about potential bias in the evidence on which the Scottish Government has reached the conclusion that a flat 50p MUP is the optimal policy route.

3.3 No account of unintended consequences

The Sheffield University appraisals have never provided an adequate treatment of various potential unintended consequences of an alcohol MUP policy. In reality, drinkers have a series of options available to them when the real price of alcohol increases, as can be expected with a 50p MUP. They can do as the government hopes and drink less, but they can also: (1) make savings elsewhere in the household budget, (2) switch from the on-trade to the off-trade, (3) downshift to cheaper drinks, (4) shop abroad, (5) brew or distil their own alcohol, (6) buy counterfeit or smuggled alcohol, and finally (7) buy surrogate alcohol (e.g. methanol, antifreeze, aftershave).

The principal options of concern are those that can have particularly negative consequences, particularly (1), (6) and (7), depending on a range of factors, and that are most likely to become attractive to the drinker population living beneath, on or just above the poverty line.

Increased suffering for the families of problem drinkers

On (1), given that the main objective of problem drinkers in to maintain levels of inebriation, maintaining levels of consumption might mean that they use more of their income on alcohol purchases. This could be at the expense of food for the family or for heating which, for a low income decile household, could be catastrophic for the welfare of the family, especially if the household includes dependent children. A flat 50p MUP could thereby result in even more suffering for the families of problem drinkers.

Driving increases in consumption from the illicit market

On (6), increased prices as a result of MUP could nudge financially squeezed drinkers into seeking out cheaper illicit sources of alcohol. There is ample recent evidence to suggest that the illicit alcohol trade is alive and well and that consumers do switch to it in response to increases in the price of legal duty-paid alcohol. Failure to take this into account means the estimated health-related benefits of a flat 50p MUP in the appraisal on which the Scottish Government is relying as the evidential basis for its conclusion that this is the proportionate policy are likely to be exaggerated.

The Scottish Government's consultation paper on a 50p MUP states that:

> *"We know that one of the best ways to reduce the amount of cheap alcohol drunk by people in any country is to make it less affordable. Making alcohol less affordable is a key action recommended by the World Health Organization to reduce alcohol-related harm."*

But levels of unrecorded alcohol in European countries has been demonstrated by others to suggest a strong relationship between affordability and the demand for and prevalence of both counterfeit and contraband alcohol. The World Health Organisation itself warns that restrictions on the availability of alcohol that are too strict can promote the development of parallel illicit markets.

Driving increased consumption of surrogate alcohol

On (7), the drinking of ethanol in forms other than through alcoholic beverages could be expected to have worse health implications than the same levels of drinking through normal means. This which would be entirely at odds with the intention of the policy, which is to reduce alcohol-related health harms by reducing the consumption of cheap, strong alcoholic beverages.

Cross-border trade with policy asymmetry

Another unintended consequence is the potential for cross-border trade to increase so long as there is policy asymmetry between Scotland and other parts of the UK. In other words, if Scotland introduces MUP first, the incentive for Scottish drinkers to travel across to border to England to take advantage of lower prices is introduced.

We were unable to find evidence suggesting the existing prevalence of cross-border purchases. However, we can say that the extent to which it will happen is likely to depend on factors like geography, distance and the quality of the public and other transport options linking the population centres of Scotland with the retail centres of northern England. The drinker contemplating crossing the border faces an appraisal of the cost of travel (including the value of their time) across the border against the savings that they will make on cheaper alcohol purchases. Given that bulk purchasing would be required to achieve savings of sufficient magnitude, the travel possibilities become more restricted.

However, there is little doubt that cross-border purchases can be expected to be a viable option for many, especially those living close to the border. Again, this means the estimated impacts of a flat 50p MUP in the appraisal on which the Scottish Government is relying would be exaggerated. The behaviour of these customers would defy the dictates of the elasticity of demand assumptions that drive the predicted reductions in consumption in response to a MUP in Scotland.

4 Regressive re-distributional consequences of a flat 50p MUP

This section considers the regressive re-distributional consequences of a flat 50p MUP policy, demonstrating how a disproportionate burden of the policy would fall upon the poorest in society and how those in the bottom four income deciles would see the greatest impact on both their cost and standard of living.

4.1 Inadequacy of Sheffield University appraisal

It is still the case that there are significant quantities of all types of alcohol beverage available at cheap prices, some well below the proposed flat 50p MUP, regardless of their strength (as measured by ABV). This is important in the context of the following statements from the Scottish Government consultation paper:

> *"The Scottish Government's preferred Minimum Unit Price is 50 pence per unit of alcohol. In the UK, a unit is 10 millilitres of pure alcohol. This price will have most impact on cheap, strong drink.*
>
> *"Anyone drinking cheap, strong alcohol will be most affected. The drinker that drinks moderately…will see very little difference, if any, in the cost of what alcoholic drinks they buy."*

But it is simply not the case that it is only cheap, strong alcohol that will be affected. This in turn means that it is not just the people who drink cheap, strong alcohol that will be affected.

Anyone drinking cheap, weak alcohol will be affected in the same manner. It would be a gross simplification to conclude that this is likely to make "very little difference" to the average drinker, or even the average moderate drinker, across the board. For the average or moderate drinker on a very low income, it could mean a lot relative to the overall household budget.

Therefore, contrary to the claims of the Scottish Government consultation paper, the policy will impact on any drinker that currently purchases alcohol at the lower ends of the price distribution. For any category of alcohol beverage, the price distribution is wide. Paying lower prices reflects for most a preference (voluntary or not) for a lower quality product and the range of available prices is a reflection of the range of choice on offer.

The impact is not a question of the strength of the product they currently purchase, but the low prices that they are able to pay for it at present. It is not just the strong products consumed by irresponsible drinkers that will be impacted; there are equally significant amounts of weak alcohol products the price of which will also increase.

Cebr has, in previous research, highlighted the regressive re-distributional properties of minimum unit pricing for alcohol. The increased alcohol expenditure required due to higher pricing will hit those in the poorest income deciles. This can be understood in terms of an increased cost of living if alcohol consumption is to be maintained or a reduction in their standard of living if they have to reduce their alcohol consumption in light of household budget constraints. Either way, it has the potential to exacerbate inequality. This is the subject of the remainder of this Section.

First, however, it is important to note that the Sheffield University appraisals cannot be considered to provide an adequate treatment of the regressive distributional implications of a flat MUP policy in terms

of its impact on the welfare of drinkers and their families, as reflected in their relative cost and standard of living.

To illustrate, the first line of the table below shows what the Sheffield University appraisal provides in terms of the impact on consumers. A positive number indicates that consumers will spend more, while a negative number means less spending. For example, reading from the first line of data, Sheffield University estimates that harmful drinkers in poverty will spend about £88 less on alcohol per annum, whereas the harmful drinker not in poverty will spend up to £20 more.[3]

Table 27: Sheffield University baseline projections of the impact of a 50p MUP, Cebr estimates for alternative baselines

Change in annual consumer spending on alcohol by drinker type and income status											
50p MUP		Moderate				Hazardous				Harmful			
Scenario	Description	In poverty		Not in poverty		In poverty		Not in poverty		In poverty		Not in poverty	
2014-SU	Original SU 2014 baseline	-£	0.46	£	2.27	£	1.10	£	16.37	-£	87.93	£	19.66
2014-Act	2014 baseline based on updated data	-£	0.27	£	1.82	£	0.62	£	12.59	-£	51.39	£	15.93
2016-Act-SUDG	2016 with SU drinker group assum.	-£	0.28	£	1.77	£	0.70	£	13.17	-£	56.48	£	16.38
2016-Act-CebrI	2016 with Cebr drinker group assum.	-£	0.29	£	1.84	£	0.68	£	12.86	-£	55.16	£	16.00

Source: Sheffield University - latest appraisal of MUP in Scotland

But this is bound to paint a favourable picture of the impacts of a flat 50p MUP as it only addresses whether consumers will spend more or less on alcohol once the policy is introduced. It only tells us how much more or less people will spend on alcohol per annum *after* taking account of the price increases that will result from MUP and the expected demand responses – the projected reductions in the number of alcohol units consumed. These results say nothing about:

- How much more consumers will have to pay for the alcohol that they do continue to consume (in economic theory, this is known as a transfer from consumers to producers[4]); or
- What value they lose in terms of the erosion of their standard of living as a result of having to reduce alcohol consumption (in economic theory, this is known as the deadweight loss that arises when less consumption is possible); or
- The financial hardship that it could impose on the families of problem drinkers who do not reduce their consumption in response to the introduction of a MUP.

It is also relevant to note that, for the general population, the vast majority of which are non-problem drinkers, the higher alcohol prices that will result from a 50p MUP can be expected to have a combination of these negative impacts.

4.2 Regressive consequences of a flat 50p MUP for Scotland

Table 28 shows the loss to consumers resulting from the introduction of a flat 50p MUP – those estimated by Sheffield University through its 2014-SU baseline and those estimated by Cebr for the alternative baselines.

[3] Note that the rest of the table shows how the impacts change under the alternative baseline assumptions and corresponds with the first table on alcohol consumption impacts above.

[4] It should be noted that the transfer from consumers to producers does not represent the net gain to the producer because it does not take into account the value of lost sales as a consequence of reduced demand.

Table 28: Total value of consumer losses after the introduction of a 50p MUP by baseline scenario, Sheffield elasticities

Sheffield elasticities	Moderate		Hazardous		Harmful	
50p MUP	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
2014-SU	-£ 18	-£ 11	-£ 138	-£ 85	-£ 602	-£ 296
2014-Act	-£ 14	-£ 10	-£ 106	-£ 79	-£ 501	-£ 300
2016-Act-SUDG	-£ 13	-£ 9	-£ 108	-£ 78	-£ 490	-£ 284
2016-Act-CebrDG	-£ 14	-£ 10	-£ 106	-£ 76	-£ 479	-£ 277

Source: Sheffield University - latest appraisal of MUP in Scotland, Cebr analysis

Table 29 shows Cebr's equivalent estimates of these losses in consumer welfare using HRMC's elasticity assumptions, in which we place greater faith.

Table 29: Total value of consumer losses of a 50p MUP by baseline scenario, HMRC elasticities

HMRC	Moderate		Hazardous		Harmful	
50p MUP	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
2014-SU	-£ 22	-£ 11	-£ 165	-£ 86	-£ 681	-£ 298
2014-Act	-£ 17	-£ 11	-£ 128	-£ 90	-£ 527	-£ 311
2016-Act-SUDG	-£ 18	-£ 11	-£ 143	-£ 94	-£ 576	-£ 318
2016-Act-CebrDG	-£ 18	-£ 12	-£ 139	-£ 92	-£ 563	-£ 311

Source: HMRC, Sheffield University, Cebr analysis

At the income decile level, the same losses to the consumer are shown in the following table. This provides an even clearer picture of the extent to which the bottom three income deciles would be financially clobbered by a flat 50p MUP.

Table 30: Total value of consumer losses per drinker after the introduction of a 50p MUP, by drinker type and income decile, Sheffield University elasticities and 2014 baseline

2014-SU	Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Highest
Sheffield elasticities	ten	decile	decile	decile	decile	decile	decile	decile	decile	ten
50p MUP	per cent	group	group	group	group	group	group	group	group	per cent
MODERATE	-£ 15	-£ 22	-£ 5	-£ 7	-£ 8	-£ 9	-£ 12	-£ 14	-£ 14	-£ 19
HAZARDOUS	-£ 111	-£ 165	-£ 296	-£ 53	-£ 60	-£ 68	-£ 92	-£ 108	-£ 110	-£ 148
HARMFUL	-£ 486	-£ 718	-£ 1,170	-£ 394	-£ 211	-£ 237	-£ 321	-£ 379	-£ 385	-£ 517

Source: Cebr analysis

This is even more clearly visible when they converted to the household level in Table 31.

Table 31: Total value of consumer losses per household after the introduction of a 50p MUP, by drinker type and income decile, Sheffield University elasticities and 2014 baseline

2014-SU	Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Highest
Sheffield Uni.	ten	decile	decile	decile	decile	decile	decile	decile	decile	ten
50p MUP	per cent	group	group	group	group	group	group	group	group	per cent
MODERATE	-£ 28	-£ 42	-£ 9	-£ 13	-£ 15	-£ 17	-£ 22	-£ 26	-£ 27	-£ 36
HAZARDOUS	-£ 214	-£ 316	-£ 569	-£ 102	-£ 116	-£ 130	-£ 176	-£ 208	-£ 212	-£ 284
HARMFUL	-£ 933	-£ 1,380	-£ 2,247	-£ 757	-£ 406	-£ 455	-£ 616	-£ 727	-£ 740	-£ 992

Source: Cebr analysis

These results are for the original Sheffield University baseline. The same holds when we both switch to a 2016 baseline and to HMRC demand elasticity assumptions.

Table 32: Total value of consumer losses per drinker after the introduction of a 50p MUP, by drinker type and income decile, HMRC elasticities, 2016 baseline

2016-Act-CebrDG	Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Highest
HMRC	ten	decile	decile	decile	decile	decile	decile	decile	decile	ten
50p MUP	per cent	group	group	group	group	group	group	group	group	per cent
MODERATE	-£ 17	-£ 20	-£ 6	-£ 7	-£ 8	-£ 9	-£ 12	-£ 14	-£ 15	-£ 21
HAZARDOUS	-£ 128	-£ 151	-£ 185	-£ 56	-£ 62	-£ 75	-£ 98	-£ 109	-£ 119	-£ 171
HARMFUL	-£ 515	-£ 610	-£ 969	-£ 473	-£ 211	-£ 253	-£ 330	-£ 367	-£ 402	-£ 576

Source: Cebr analysis

The impacts of the flat 50p MUP are a bit less stark for the lower income deciles, but it is not possible to change the conclusion that the burden of the policy would be likely to fall disproportionately on the poorest households in Scotland.

Table 33: Total value of consumer losses per household after the introduction of a 50p MUP, by drinker type and income decile, HMRC elasticities, 2016 baseline

2016-Act-CebrDG	Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Highest
HMRC	ten	decile	decile	decile	decile	decile	decile	decile	decile	ten
50p MUP	per cent	group	group	group	group	group	group	group	group	per cent
MODERATE	-£ 32	-£ 38	-£ 11	-£ 14	-£ 15	-£ 18	-£ 23	-£ 26	-£ 29	-£ 41
HAZARDOUS	-£ 245	-£ 291	-£ 355	-£ 108	-£ 120	-£ 144	-£ 188	-£ 209	-£ 229	-£ 328
HARMFUL	-£ 989	-£ 1,172	-£ 1,861	-£ 909	-£ 405	-£ 487	-£ 633	-£ 705	-£ 773	-£ 1,106

Source: Cebr analysis

For instance, the impacts on harmful drinkers in the three lowest income deciles each account for 4%, 5% or 8%, respectively of the average Scottish annual household budget. Families with problem drinkers whose demand for alcohol does not respond much to the MUP policy can expect to suffer through cuts elsewhere in the household budget. Alternatively, the drinker seeks cheaper alternatives on the black market or through surrogate products.

This is of even greater relevance in the context of the current economic circumstances, particularly the challenges presented by the significant depreciation in the value of sterling following the Brexit vote, the resulting rise in inflation and the further squeeze on household disposable incomes, given the UK's import dependence in the areas of food and drink. Minimum unit pricing but, in particular, the Scottish Government's proposed flat 50p option is likely to impose further hardship on families already facing challenging times.

5 A less regressive ABV-banded MUP approach

The highly regressive consequences of the flat 50p MUP option motivated Cebr to consider whether there might be less regressive alternative ways to implement a MUP policy. We drew on the fact that the UK's duty regime recognises, as a matter of public policy, that lower strength alcohol beverages within a product category are treated more favourably and thereby conceived a similar ABV-banded MUP system. (Note, however, that across categories, the duty regime allows for some higher strength beverages to achieve preferential financial treatment.)

This section demonstrates that, while this alternative MUP structure is equally effective as a flat 50p in terms of the stated objectives of the policy of reducing alcohol consumption and the associated health and other harms, it is also significantly less regressive in its consequences for redistribution.

5.1 The economic rationale for a banded MUP system

The alternative scheme that we have assessed is reflected in the following table.

Table 34: Banded MUP policy based on the strength of the alcoholic beverage

Alcohol Content by Volume	MUP
1.2% – 2.8%	30p
2.9% - 5.5%	40p
5.6% - 10%	50p
11% - 20%	60p
21% - 40%	60p

Up to now and, likewise, in the Sheffield University appraisals, the focus has been on the price effects on the demand for alcohol. In a banded system, the natural presumption is that all drinkers who are responsive to price changes (because they want to maintain their levels of alcohol consumption and inebriation) will simply shift their consumption to whichever form of alcoholic beverage has the lowest MUP in the banded system. That will allow the drinker to maximise his/her alcohol intake (measured in units) for a fixed budget.

This can be conceptualised in terms of a demand curve for alcohol units and the fact that, for a given intake of units (say the annual average for a harmful drinker at over 4,000), there are probably infinitesimal mixes or 'baskets' of the different types of alcohol beverage that could make up this intake. Within a fixed budget, the flat MUP would cause a drinker to move along their demand curve for alcohol units (they reduce demand for alcohol units depending on their general price responsiveness), but the heaviest drinkers can be expected to seek to minimise the extent of that movement (i.e. the extent to which they have to reduce their consumption of alcohol units to fit within their budget constraint) by changing the mix of alcoholic beverages that they drink.

But, we asked ourselves, what if there are factors that act as a constraint on this behaviour? Specifically, how much low ABV product would a person have to drink in order to achieve the levels of inebriation achieved by those who drink at harmful levels? And what if it is actually physically impossible for a person or, at least, unpalatable / unsuitable to their preferences, to drink that much beverage? This physical or preferential constraint provides a rationale for a shift in the demand curve for alcohol units, regardless of the fact that there would be different MUPs for different strength products.

This concerns physical constraints on alcoholic beverage (as opposed to pure alcohol) intake. For instance, leaving aside inebriation, if it is physically impossible to consume the required levels of the

products that are available at prices that fit within a drinker's budget constraint under a banded MUP system, the physical or preferential constraint (not to want to drink the amount of the beverage that is required) may actually 'force' or incentivise a reduction in their intake of alcohol units.

The banded MUP system would essentially force a trade-off for the harmful drinker and would put a premium on getting drunk fast. The drinker would have to choose between paying higher prices for higher strength products that will get him or her drunk quicker or lower strength products that fit better within their budget constraint but that will increase the time and effort it takes to achieve inebriation.

We have used this idea to produce a separate version of our model that assesses the performance of this banded MUP scheme against the Scottish Government's proposal of a flat 50p MUP. The results are outlined below.

5.2 Impact on alcohol consumption

Table 35 shows the performance of the banded MUP system in terms of reducing alcohol consumption. This can be compared with Table 24, Table 25 and Table 26 above. This comparison reveals that the banded MUP system based on the strength of alcoholic beverage performs better.

Table 35: Reductions in alcohol consumption under a banded MUP system

Change in number of units of alcohol consumed by drinker type and income status						
HMRC elasticities	Moderate		Hazardous		Harmful	
Baseline	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
2014-SU	-13	-3	-120	-41	-724	-192
2014-Act	-10	-4	-93	-42	-561	-200
2016-Act-SUDG	-10	-4	-103	-44	-610	-204
2016-Act-CebrDG	-11	-4	-101	-43	-599	-200

Source: Cebr analysis

Table 27 shows the performance of the banded system relative to Sheffield University's predictions for a flat 50p MUP using its own elasticity assumptions. For instance, it shows that the banded MUP system, under the more robust HMRC elasticity assumptions, could reduce alcohol consumption amongst hazardous drinkers in poverty by an additional 33-34 units per annum and amongst harmful drinkers in poverty by an additional 84-85 units per annum, under the appropriate 2016 baselines.

Table 36: Performance of banded MUP relative to flat 50p in reducing alcohol consumption, Sheffield elasticities for flat 50p

Added reductions in units of alcohol consumed by drinker type and income status under BANDED MUP						
HMRC elasticities	Moderate		Hazardous		Harmful	
Baseline	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
2014-SU	3	1	32	11	43	11
2014-Act	2	1	24	11	33	12
2016-Act-SUDG	3	1	34	15	85	28
2016-Act-CebrDG	3	1	33	14	84	28

Source: Cebr analysis

To illustrate the consistency of the result, the following table shows the performance of the banded system relative to what the Sheffield University Alcohol Policy Model would predict for a flat 50p MUP using HMRC elasticity assumptions. Again, although the differences are smaller in magnitude, across the board, the banded MUP system achieves greater reductions in alcohol consumption.

Table 37: Performance of banded MUP relative to flat 50p in reducing alcohol consumption, HMRC elasticities for flat 50p

Added reductions in units of alcohol consumed by drinker type and income status under BANDED MUP						
HMRC elasticities	Moderate		Hazardous		Harmful	
Baseline	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
2014-SU	1	0	14	5	15	4
2014-Act	2	1	21	9	4	1
2016-Act-SUDG	1	0	12	5	15	5
2016-Act-CebrDG	1	0	12	5	14	5

Source: Cebr analysis

5.3 Less regressive in its re-distributional consequences

This subsection builds on the evidence in Section 4 by exploring the same properties of the banded MUP system. Table 38 can be compared with Table 29 in terms of the analysis of harm to consumer welfare in terms of the effects of the banded MUP system.

Table 38: Total value of consumer losses of a banded MUP system by baseline scenario, HMRC elasticities

HMRC	Moderate		Hazardous		Harmful	
Banded MUP	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
2014-SU	-£ 24	-£ 14	-£ 188	-£ 108	-£ 649	-£ 315
2014-Act	-£ 19	-£ 14	-£ 146	-£ 113	-£ 502	-£ 329
2016-Act-SUDG	-£ 19	-£ 13	-£ 163	-£ 116	-£ 557	-£ 335
2016-Act-CebrDG	-£ 20	-£ 14	-£ 159	-£ 113	-£ 544	-£ 327

Source: Cebr analysis

Table 39 provides the comparison. This shows that, for the most important target of the policy, harmful drinkers in poverty, the banded MUP imposes less damage on the welfare of these drinkers and, consequently, on the welfare of the families that are dependent on them. Hazardous drinkers in poverty lose a bit more but this is far outweighed by the reduced losses to harmful drinkers in poverty. The banded system shows a marginal additional impact on moderate drinkers.

Table 39: Performance of banded MUP relative to flat 50p in terms of impact on consumer welfare by baseline scenario, HMRC elasticities for flat 50p

HMRC	Moderate		Hazardous		Harmful	
Banded MUP	In poverty	Not in poverty	In poverty	Not in poverty	In poverty	Not in poverty
2014-SU	£ 2	£ 3	£ 23	£ 22	-£ 32	£ 17
2014-Act	£ 1	£ 3	£ 18	£ 23	-£ 25	£ 18
2016-Act-SUDG	£ 2	£ 2	£ 20	£ 22	-£ 19	£ 17
2016-Act-CebrDG	£ 2	£ 2	£ 20	£ 21	-£ 18	£ 17

Source: Cebr analysis

The following tables show the consumer welfare impacts under a banded MUP system at the income decile level. Table 40 and Table 41 can be compared with Table 30 and Table 31 (for a flat 50p MUP

assuming Sheffield University demand elasticities) and with Table 32 and Table 33 (flat 50p MUP assuming HMRC elasticities).

Table 40: Total value of consumer losses per drinker after the introduction of a banded MUP, by drinker type and income decile, HMRC elasticities and 2014 baseline

2014-SU	Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Highest
HMRC elasticities	ten	decile	decile	decile	decile	decile	decile	decile	decile	ten
Banded MUP	per cent	group	group	group	group	group	group	group	group	per cent
MODERATE	-£ 19	-£ 29	-£ 6	-£ 9	-£ 10	-£ 11	-£ 15	-£ 17	-£ 18	-£ 24
HAZARDOUS	-£ 152	-£ 224	-£ 49	-£ 68	-£ 77	-£ 87	-£ 117	-£ 138	-£ 141	-£ 189
HARMFUL	-£ 523	-£ 774	-£ 143	-£ 198	-£ 225	-£ 252	-£ 341	-£ 402	-£ 410	-£ 549

Source: Cebr analysis

On a per household level, the impacts are shown in Table 41.

Table 41: Total value of consumer losses per household after the introduction of a banded MUP, by drinker type and income decile, HMRC elasticities and 2014 baseline

2014-SU	Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Highest
HMRC elasticities	ten	decile	decile	decile	decile	decile	decile	decile	decile	ten
Banded MUP	per cent	group	group	group	group	group	group	group	group	per cent
MODERATE	-£ 37	-£ 55	-£ 12	-£ 16	-£ 19	-£ 21	-£ 28	-£ 33	-£ 34	-£ 45
HAZARDOUS	-£ 291	-£ 431	-£ 95	-£ 131	-£ 149	-£ 167	-£ 225	-£ 266	-£ 271	-£ 363
HARMFUL	-£ 1,005	-£ 1,486	-£ 275	-£ 379	-£ 432	-£ 484	-£ 655	-£ 773	-£ 787	-£ 1,055

Source: Cebr analysis

The following tables show the differences between the banded MUP results and the flat 50p MUP under HMRC elasticity assumptions.

Table 42 suggests that, at the individual drinker level, the banded MUP policy is less regressive for the heaviest drinkers in the lowest income deciles – with a negative number indicating that the consumer welfare loss is smaller under the banded system than the flat 50p MUP. This is especially the case for those in the third income decile, who were projected to be particularly hard hit by a flat 50p MUP.

Table 42: Performance of banded MUP relative to flat 50p in terms of impact on consumer welfare by drinker type and income decile, HMRC elasticities for flat 50p, 2014 baseline

2014-SU	Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Highest
HMRC elasticities	ten	decile	decile	decile	decile	decile	decile	decile	decile	ten
Banded MUP	per cent	group	group	group	group	group	group	group	group	per cent
MODERATE	£ 2	£ 2	£ 1	£ 2	£ 2	£ 2	£ 3	£ 3	£ 3	£ 5
HAZARDOUS	£ 19	£ 28	-£ 246	£ 14	£ 16	£ 18	£ 24	£ 28	£ 29	£ 38
HARMFUL	-£ 26	-£ 38	-£ 1,025	-£ 196	£ 12	£ 13	£ 18	£ 21	£ 22	£ 29

Source: Cebr analysis

Table 43 illustrates how these properties hold when switching to a 2016 baseline. This produces an equally impactful change in the re-distributional consequences of introducing MUP.

Table 43: Performance of banded MUP relative to flat 50p in terms of impact on consumer welfare by drinker type and income decile, HMRC elasticities for flat 50p, 2016 baseline

2016-Act-CebrDG	Lowest	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Highest
HMRC elasticities	ten	decile	decile	decile	decile	decile	decile	decile	decile	ten
Banded MUP	per cent	group	group	group	group	group	group	group	group	per cent
MODERATE	£ 2	£ 2	£ 1	£ 2	£ 2	£ 2	£ 3	£ 3	£ 3	£ 5
HAZARDOUS	£ 18	£ 21	-£ 128	£ 13	£ 15	£ 17	£ 23	£ 25	£ 28	£ 40
HARMFUL	-£ 17	-£ 20	-£ 805	-£ 273	£ 11	£ 14	£ 18	£ 20	£ 22	£ 31

Source: Cebr analysis

It cannot be said for certain though that some of the gains to the poorest harmful drinkers are not at the expense of hazardous and moderate drinkers that are also in poverty, as they both endure a larger welfare loss than under the banded MUP scheme.

Nonetheless, the evidence points to a strong suggestion that a banded MUP system, based on the different strength of alcoholic beverages (their ABV), softens the highly regressive implications of the flat 50p MUP policy, especially for the poorest and heaviest drinkers. This is whilst achieving broadly the same or superior results in terms of reducing alcohol consumption (particularly amongst this type of drinker) than those predicted by Sheffield University for a flat 50p MUP.

The banded MUP system is therefore worth exploring as a policy approach that has the potential to be equally if not more effective in meeting the stated objectives of the Scottish Government for minimum unit pricing, but that does far less damage in terms of its regressive distributional consequences. In other words, the banded MUP system has the potential to be a more proportionate and appropriately targeted policy than the flat 50p MUP currently considered by the Scottish Government to best fulfil those criteria.

Appendix: Critique of Sheffield University's work on alcohol demand elasticities

The Meng et al (2014) University of Sheffield paper contains some important insights and innovations. In addition to utilising a pseudo panel approach to compute the general own price elasticities across different alcoholic beverages, it also attempts to examine cross price elasticities, showing the impact of a price rise in one beverage category on another. Within the pseudo-panel approach, the study produced a baseline fixed-effects panel model that showed a range of negative own price elasticities for different types of alcoholic beverages.

While the models employed produced coefficients that, as expected, had a negative sign – we are concerned about the magnitudes involved. We highlight below specifically where these concerns arise. Some of our comments dwell on the empirical output being counterintuitive and potentially inconsistent with economic theory. But there are also conceptual reservations about the broader methodology employed, especially in terms of how the consumption aggregations have been put together in failing to distinguish between different types of drinker.

Differences between types of drinker

While the pseudo panel approach employed is arguably an elegant solution that makes the most of panel data applied at different points in time, there are concerns about the fact that the coefficients obtained are very general. As such, they would not capture the fact that problem drinkers tend to exhibit behaviours that are different to average behaviour. For instance, economic theory suggests that alcohol addiction will result in extremely low elasticities of demand.

This lack of detail may have been driven by data limitations, in that the UK Living Costs and Food Survey (LCF) deals with expenditure across general sample groups. However, it would have been worth exploring whether it was possible to segment the data samples to isolate heavy drinkers as part of an effort to provide more nuance around the estimated coefficients. Nevertheless, if there was a structural difference between the high and low alcohol consumption individuals, it could have been incorporated within the fixed effects model that tries to correct for sources of bias such as omitted explanatory variables.

Counterintuitive elasticity magnitudes

To look specifically at the results of the Sheffield University research, the results show a fair amount of variance in between the different markets. For instance, off trade beer is shown to have an own price elasticity of -0.98, increasing in magnitude to -1.268 for cider. Meanwhile the coefficients for other beverages are relatively low in magnitude, coming to -0.384 for wine and -0.082 for spirits and -0.585 for RTD beverages. The relatively low magnitude coefficient for spirits is not statistically significant. These results represent the off trade sector, associated with relatively lower prices for alcoholic beverages sold outside of pubs, bars, restaurants and other on-trade establishments.

The lower prices are therefore interesting in light of the relatively high elasticity coefficient magnitudes. For instance, the analysis is suggesting that consumption in the off-trade is more responsive to changes in price than it is within the higher priced "on trade" segment. The intuition behind these results is not clear given that, at relatively low prices, consumer demand responses can be expected to be less potent because the changes are affecting a relatively smaller portion of one's budget.

When looking at the "on trade" segment, the coefficients are actually somewhat higher. For instance, the own price elasticity of beer comes to -0.786, while for cider it stands at -0.591, while the wine coefficient comes to -0.871. The coefficient for spirits is in sharp contrast to what was obtained in the off-trade segment - at -0.89. Lastly, the elasticity of RTDs came to a relatively low magnitude of -0.187 (and was not statistically significant).

Contrary to our aforementioned narrative that the higher on trade prices should exhibit greater elasticity, the Sheffield University paper appears to take an opposing view:

> *"In the off-trade, cider will be most affected due to the high prevalence of very high strength and low priced products"*

As a justification for the Sheffield University view, one could hypothesise that, because the segment appeals to more cost-conscious consumers, they may be more sensitive to price movements. However in order for this to happen one would have to assume the presence of significant income and substitution effects. But this rationale does not hold up at very low prices or under a blanket MUP because the income and substitution effects can only ever be small. In other words, if a drinker is already purchasing from the bottom end of the price distribution, there will be very limited opportunities to achieve better value by switching between similarly priced products.

Problems disentangling demand-side vs supply-side dynamics

There may also be a conceptual problem associated with combining the structural dynamics of time dependant responses by similar agents and the cross-sectional responses of agents, even within this pseudo-panel model.

To elaborate further, what we are observing is the relationship between consumption and the paid prices. This is simply an empirical relationship that can be driven by two underlying economic transmissions, namely demand side and supply-side dynamics. It is not clear that the elasticity coefficients are producing a figure that is consistent with the classical definition of elasticity, namely the sensitivity of consumption to changes in price - or otherwise known as movements along the demand curve. It may also, in other words, be picking up shifts in the demand curve (or movements along the supply curve) due to changes in factors other than price that can impact on demand, such as incomes or preferences.

The Sheffield University modelling has indeed controlled for part of this "demand-side" element by incorporating a mean income variable in the regressions, but it is not unreasonable to submit that other factors mentioned are not adequately captured. If these omitted transmissions have time-variant values it may be necessary to have other explicit terms in the equations to fully capture them. One could therefore suggest that, although an empirically significant relationship between price and consumption is being captured, the resulting coefficient represents an average of two separate transmissions

For a purely cross-sectional model one could argue that the price differences captured are more closely related to shifts along the demand curve. This insight comes about as a result of the data capture showing relationships at one specific point in time between the prices paid for alcoholic beverages and the amounts consumed. But, within a cross-sectional model, prices paid may vary as a result of frictions, such as shopping location preferences and geographic discrimination and differentiating features like packaging, branding etc.

While one could argue that there are some conceptual barriers to simply applying these coefficients to a scenario whereby all consumers end up facing a rise in prices paid because of something like minimum pricing policy – the nature of the modelling takes us closer to the notion of a shift along the demand

curve. This observation is likely most relevant for the “off-trade” segment. Within the “off trade” segment the limited amount of underlying differentiation can be assumed to exist between outlets selling products, namely because many of them are essentially selling the same product subject to slight differences in the customer experience. This means that the underlying differences in prices paid for similar products during the same period of time are more likely to be due to consumption differentiation rather than actual demand side shifts – since the overall levels of demand should be substantially similar.

This thought process is however less clear for the “on-trade” segment, where a considerable amount of differentiation exists between the establishments selling the product, because many of the providers are also selling an experience and environment which varies considerable from place to place. Cross-sectional differences in the empirically derived elasticities could therefore also include differences in the levels of demand, because the underlying product is far more differentiated and subject to monopolistic competition.

When the data is expanded across a temporal dimension – this introduces the possibility of the elasticity estimates capturing both price and non-price effects (or, respectively, shifts along the demand curve and shifts in the demand curve). This observation is potentially true for both the on trade and the off-trade segments.

Timing sample problems

According to the ONS, the LCF is conducted throughout the year on a yearly basis. This might create a time inconsistency in the data - in that the cross-sectional element in the survey data is itself more similar to a panel sample, especially if the data collection process takes place over many months during a year. Our main concern therefore is that this data is not contemporaneous, although it is treated as such within the modelling.

Another timing related issue concerns the use of the year 2009, which was a period of extreme financial shock and macroeconomic turbulence. Linear estimates of elasticities can break down at times of economic distress.

Real-world demand responses may have considerable frictions for a number of underlying reasons. Firstly, individuals may be assumed to act rationally over the long run, but over the short run cognitive biases and information asymmetries can hamper decision making. Secondly, individuals may take time to adapt to circumstances and optimise consumption - meaning the short run responses differ compared to long run responses. Furthermore, market dynamics themselves might take a while to manifest. For instance, restocking and purchase cycles may become relevant.

In conclusion, price demand modelling sometimes does need to include autoregressive and moving average components to capture inertia and price adjustment processes. In this case, the constraint is partially eliminated by the fact that sampling appears to take place throughout the course of a year, making the technical market dynamics more difficult to observe. It can however be argued that, where price changes occur very early or late in the year, changes in behaviour can spill over to subsequent periods.