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Tackling heavy drinking through tax reform and minimum unit pricing



European Research Council



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Executive summary

The current system of alcohol taxes in the UK is incoherent. The UK's departure from the European Union offers an opportunity to improve the way that alcohol is taxed, as EU regulations that place constraints on the system of alcohol duties will no longer apply.

As of May 2018, Scotland became the first nation in the world to introduce a minimum unit price for alcohol, making it illegal to sell alcohol for less than 50p per unit.

In this briefing note, we provide new evidence on the impact of the introduction of the minimum unit price on alcohol purchases, showing it was effective at reducing the alcohol purchases of the heaviest drinkers, whose drinking is likely to be the costliest to society. A drawback of a minimum unit price is that it leads to a fall in tax revenue and an increase in revenue going to the alcohol industry. We show that a simple reform to alcohol duties – taxing all alcohol in proportion to its alcohol content, with a higher rate on strong spirits – is almost as well targeted at the purchases of heavy drinkers and leads to a small increase in tax revenue. Now the UK has departed the EU, such a reform is feasible. If other parts of the UK do decide to introduce a minimum unit price, combining this with a sensible tax reform would limit the loss in tax revenue.

Key findings

- 1 The introduction of the minimum unit price in Scotland led to an increase in the average price per unit of alcohol sold in shops of 3p per unit, or roughly 5%. But there was a great deal of variation in the impact on different products: some previously very cheap products saw their prices more than double, while those previously above the minimum saw no increase in their price.
- 2 These price changes led to an 11% reduction in the average number of units that households purchased from shops per adult per week.
- 3 The minimum unit price led to larger reductions in the units purchased by heavy drinkers than lighter ones. For instance, it led to a 12% reduction among households that previously bought 30 units per adult per week, compared with 6% for those that previously bought 5 units per adult per week. Therefore, a minimum unit price is well targeted at heavy drinkers.
- 4 The impact of introducing a minimum unit price for the entire UK, relative to it not being in place anywhere, would be to reduce tax revenue by £390 million per year.
- 5 Replacing the current system of duties with a two-rate structure that taxes alcohol in proportion to its alcohol content, with a higher rate on strong spirits, would be almost as well targeted at heavy drinkers as a minimum unit price, but would lead to an increase in tax revenue of over £70 million.
- 6 We find that the combination of a two-rate structure that taxes alcohol in proportion to its alcohol content, with a higher rate on strong spirits, and a 50p minimum unit price would be as well targeted at the alcohol purchases of heavy drinkers as the same minimum unit price applied on top of the current system of taxation. However, the combination of the two-rate structure and minimum unit price would lead to a smaller decline in tax revenue than if the alcohol duties were left unchanged.

1. Introduction

The UK government is currently gathering evidence on possible reforms to the system of alcohol duties. Now that the UK has left the European Union, there is more scope to vary the way that alcohol is taxed.

Alcohol taxation is certainly in need of reform. The current system of duties is incoherent, with rates that vary across beer, cider, wine and spirits, and by alcoholic strength, with little apparent logic. If you prefer a pint of beer to cider, you may currently pay more than twice as much tax for a drink with the same alcohol content.

But tax is not the only way that the government can influence alcohol prices. In 2018, Scotland introduced a minimum unit price for alcohol, making it illegal to sell alcohol below 50p per unit.¹ The aim of the policy was to raise the prices of the cheap and high-alcohol-content drinks that are preferred by heavy drinkers.

In this briefing note, we present new evidence on the impact of the Scottish minimum unit price and discuss how such a policy might fit with the UK government's plans to reform alcohol duty. We show that the minimum unit price reduced alcohol purchases of the heaviest drinkers – those whose drinking likely creates the largest costs to society and themselves – but this comes at a cost of reducing tax revenue.

A simple reform to the system of alcohol duties can achieve similar reductions in alcohol purchases across the drinking distribution and has the benefit of raising rather than depressing tax revenue. The reform we consider entails moving to a system where all products are taxed per unit of alcohol, with a higher rate on strong spirits.

¹ A unit is 10ml (millilitres) of ethanol. A 250ml glass of 12.5% ABV (alcohol by volume) wine contains 3.1 units and a pint of 5% ABV beer contains 2.8 units.

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Other reforms to the tax system could either raise more tax revenue, but at the cost of being less well targeted at reducing purchases of heavy drinkers, or do a better job of targeting heavy drinkers but raise less revenue. The reform that we consider is a compromise between this trade-off and has the advantage that it is simple and is similar in structure to the way beer is currently taxed.

If the UK government does decide to introduce a minimum unit price for England, it should combine this with sensible tax reform. This would limit the reduction in tax revenue that results from a minimum unit price.

2. The impact of the Scottish minimum unit price

In May 2018, it became illegal to sell alcohol in Scotland for below 50p per unit of alcohol. The Scottish parliament first legislated for the policy in 2012, but its implementation was delayed due to a legal challenge. The policy is explicitly motivated as a way to deal with the challenges posed by problem drinking, while limiting the impact on light and moderate drinkers (NHS Health Scotland, 2019).

In a recent working paper (Griffith, O’Connell and Smith, 2020), we use data on the alcohol purchases made by a sample of 32,480 households living in Scotland and England to assess the impact of the minimum unit price. For these households, the data cover all purchases of alcohol for consumption at home (i.e. excluding alcohol consumed in restaurants and bars), which account for over three-quarters of all alcohol consumed in the UK.

We compare the evolution of the prices and quantities of alcohol purchased by households in Scotland over the period May 2016 to January 2020 with the purchases made by English households over the same period, who act as a control group. This allows us to measure the causal impact of the policy in Scotland under the assumption that, if the minimum unit price had not been introduced, then prices and purchases would have evolved in Scotland in the same way as they did in England.

What happened to alcohol prices?

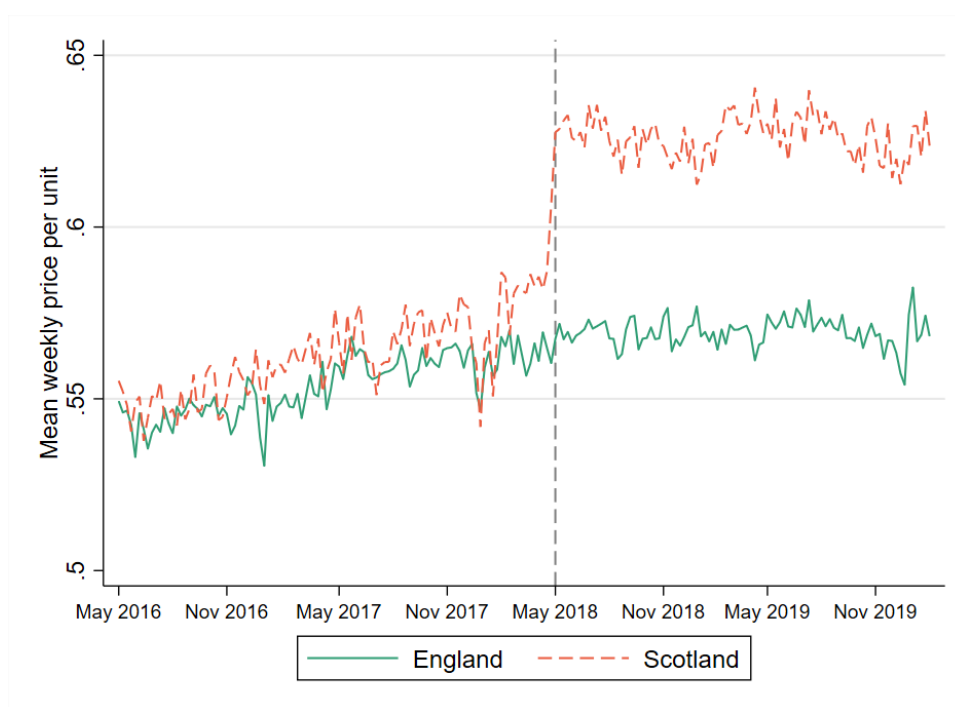
Figure 2.1 shows the evolution of the average price paid per unit of alcohol in England and Scotland before and after the introduction of the minimum unit price in Scotland. It shows that, before the minimum unit price was introduced in May 2018, prices in Scotland and England were similar; this provides support for our

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assumption that in the absence of the minimum unit price, Scottish prices would have continued to look similar to English ones. However, there was a sharp increase in the average price paid following the introduction of the minimum unit price in Scotland.

In Griffith, O’Connell and Smith (2020), we estimate the increase in the average price paid in Scotland compared with England after controlling for differences in the average price level across the two nations, variation in the types of products that people buy over time, and any changes in the composition of the sample over this period. We find that the minimum unit price led to an increase of around 5% in prices on average.

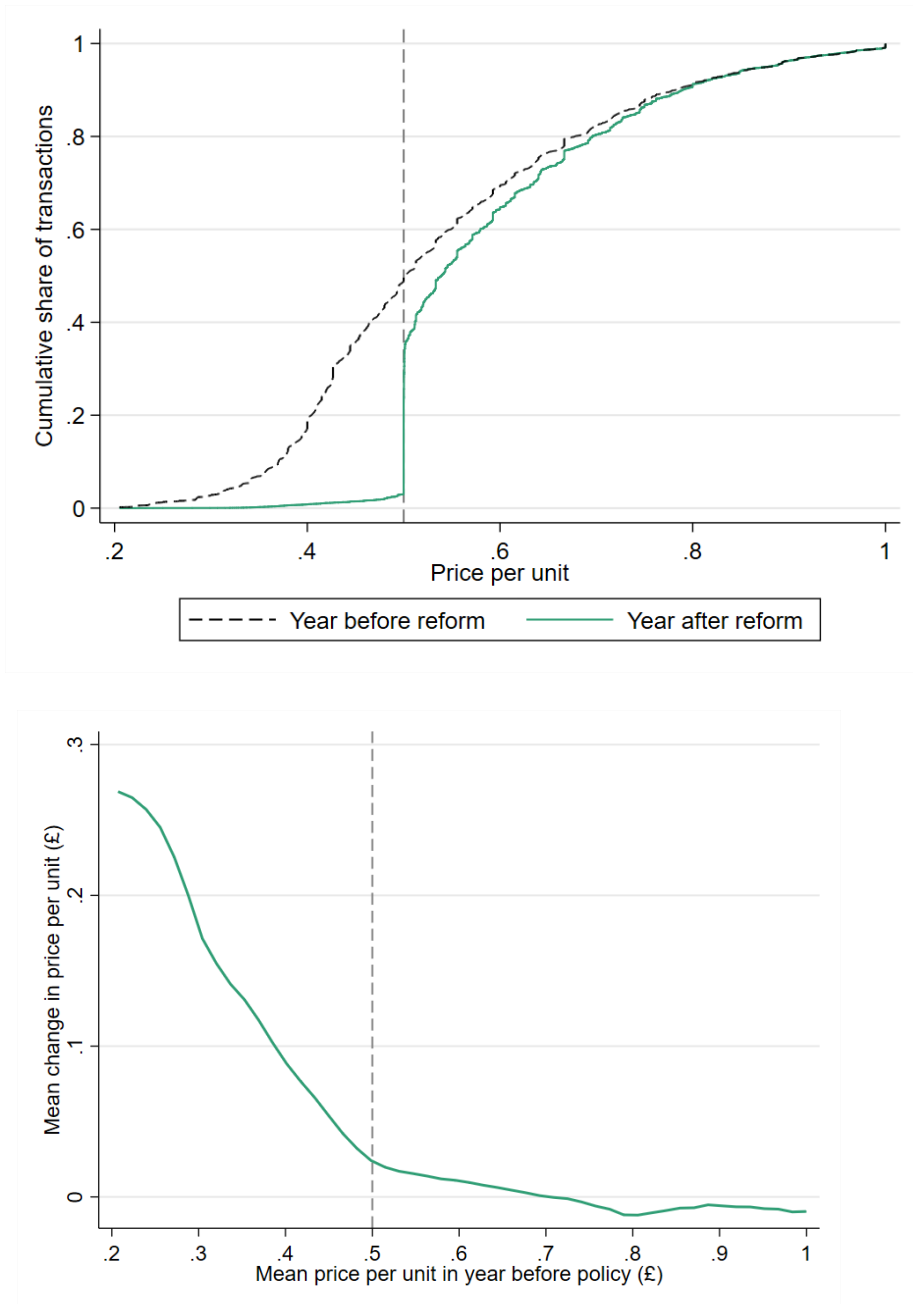
Figure 2.1. Average price per unit of alcohol in Scotland and England



Note: The figure shows the evolution of mean price paid per unit of alcohol in Scotland and England in each week from May 2016 to January 2020. The dashed vertical line shows the introduction of the minimum unit price in Scotland on 1 May 2018.

Source: Figure 1.1(a) in Griffith, O’Connell and Smith (2020).

Figure 2.2. Change in prices in Scotland following the introduction of the minimum unit price



Note: The top panel shows the distribution of price paid per unit across transactions in Scotland in the year before and after the introduction of the minimum unit price. The bottom panel shows, for the set of products that are recorded as purchased in the year before and after the introduction of the minimum unit price (which account for 80% of spending across the two years), the average change in price per unit, conditional on the product's average price in the year preceding the reform.

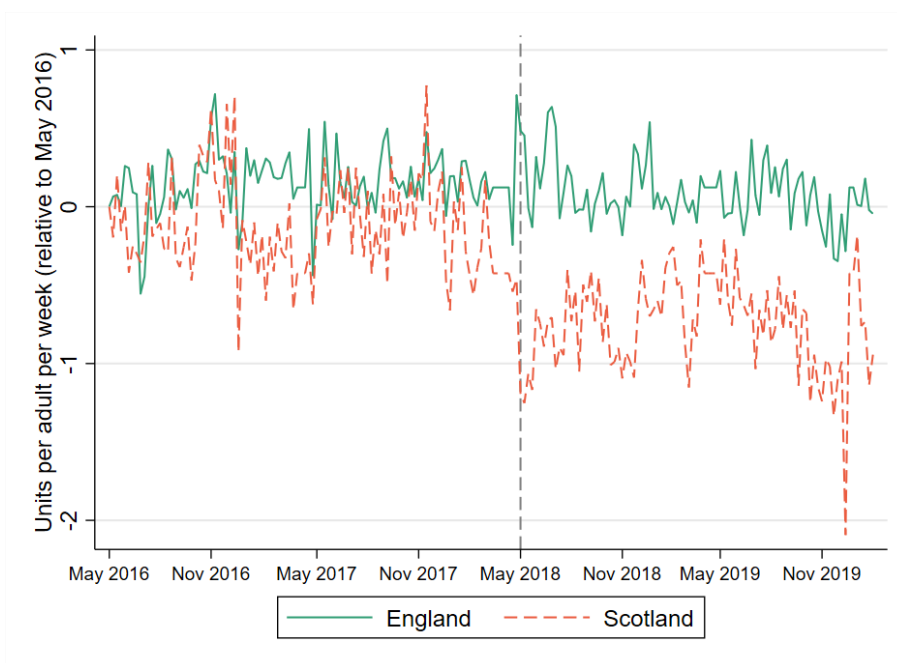
Source: Figures 3.1(a) and 3.1(c) in Griffith, O'Connell and Smith (2020).

This change in average price masks significant differences in how prices changed across different products. Figure 2.2 shows that half of all alcohol transactions in Scotland in the year before the minimum unit price came into place were for products priced at less than 50p per unit, while afterwards around a third were for products priced at exactly 50p per unit. The bottom panel of the figure shows how the average change in price per unit in Scotland following the introduction of the minimum unit price varies with the average price of the product prior to the reform. Some very cheap products – such as strong cider – more than doubled in price as a result of the new minimum. The price of most products that were previously priced above the 50p per unit threshold did not change as a result of the policy.

Did people buy less alcohol?

Figure 2.3 shows how the average number of units of alcohol purchased per adult per week changed (relative to May 2016) in England and Scotland before and after the implementation of the minimum unit price in Scotland. Similar to prices, the

Figure 2.3. Average units purchased in Scotland and England



Note: The figure shows the evolution of mean units purchased per adult per week in Scotland and England in each week from May 2016 to January 2020. The dashed vertical line shows the introduction of the minimum unit price in Scotland on 1 May 2018.

Source: Figure 1.1(b) in Griffith, O’Connell and Smith (2020).

evolution of purchases was similar in the two nations prior to the introduction of the minimum unit price. Following the reform, units in Scotland (but not in England) fell.

In Griffith, O’Connell and Smith (2020), we estimate that the fall in average purchases caused by the minimum unit price was 0.63 units per adult per week, which is equivalent to an 11% fall.

Was the policy well targeted at heavy drinkers?

The primary rationale for policy designed to raise the price of alcohol is that there exist wider costs that are associated with alcohol consumption that are not fully borne by the drinker. These ‘externalities’ include the health costs associated with treating diseases caused by heavy drinking, drink driving and domestic violence.

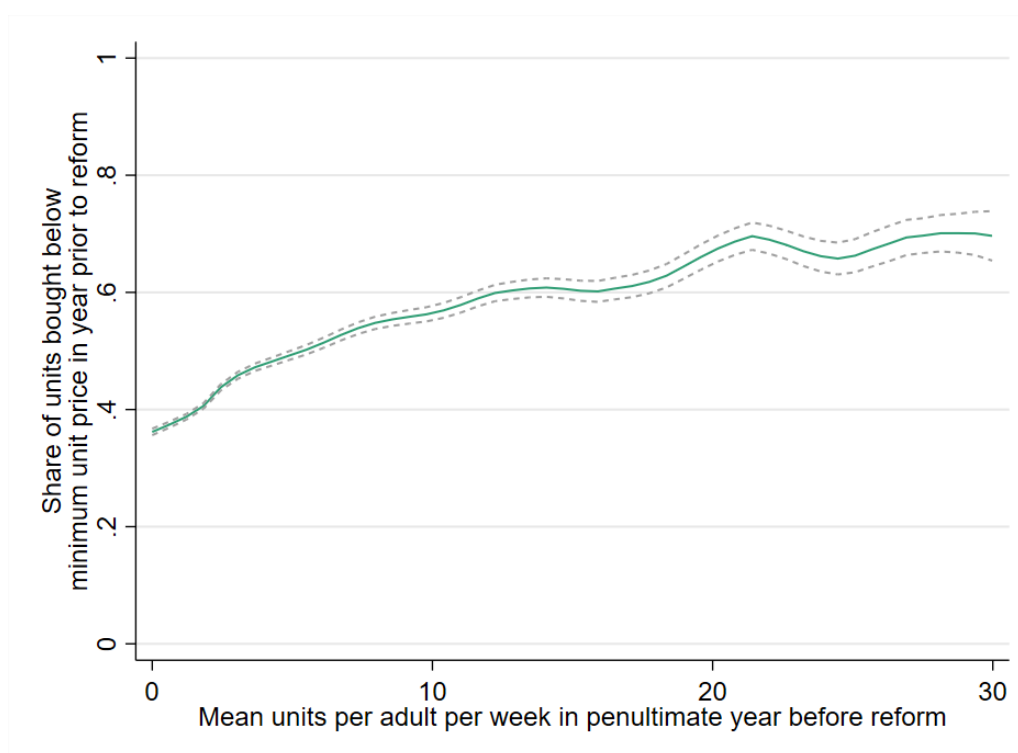
There is considerable evidence that the costs to wider society of having one more drink are higher for people who consume a lot of alcohol than for light drinkers. For example, there is evidence of a threshold effect of minimal risk at low levels of alcohol consumption with sharply increasing risk at higher levels for some diseases, such as liver cirrhosis (Rehm et al., 2010) and tuberculosis (Lönnroth et al., 2008). When policy is aimed at reducing the social costs of drinking, and those costs are higher for heavier drinkers, then an effective policy would reduce the consumption of these people, while limiting the impact of price increases on lighter drinkers.

In Griffith, O’Connell and Smith (2020), we show how the impact of the minimum unit price varies depending on how much alcohol, on average, households bought prior to the reform. We measure how heavily households drink based on the average number of units they bought per adult per week over the course of one year. A strength of our data set is that we observe purchases over this relatively long period. A drawback of it is that we do not observe individuals’ consumption. In multi-adult households, alcohol purchases may not be split evenly between adults. If the social costs of drinking an additional drink are higher for heavy drinkers than for lighter drinkers, the total social costs of a household’s drinking will likely be higher if one member accounts for the majority of intake, relative to the case where the alcohol is split evenly across household members.

We find that the policy led to the largest reductions in alcohol units among the heaviest-drinking households. For instance, the minimum unit price led to an average reduction of 12% in units of alcohol per adult purchased by households that previously bought 30 units per adult per week. In comparison, it led to only a 6% fall among those households that previously bought 5 units per adult per week. This is, in part, because heavy drinkers tend to obtain a higher proportion of their alcohol from products that are cheap per unit (see Figure 2.4). They are therefore more exposed to price rises resulting from a minimum unit price.

In summary, the minimum unit price has succeeded in reducing the alcohol purchases of those whose drinking is likely to be the costliest for society.

Figure 2.4. Share of units purchased below the minimum unit price across the distribution of drinkers



Note: The figure shows the share of units purchased below the minimum unit price over the period May 2017 to April 2018 in England and Scotland combined, by the mean units purchased per adult per week over the period May 2016 to April 2017. The dashed lines show 95% confidence intervals.

Source: Figure 3.5(a) in Griffith, O'Connell and Smith (2020).

3. How could the government reform alcohol duties?

Minimum unit pricing has been successful in lowering the number of alcohol units purchased by the heaviest drinkers. However, relative to tax policy, it has a less attractive property. By prohibiting the sale of alcohol priced below a particular level, the minimum price has the effect of relaxing competition in the market: without a legal price floor, competitive forces drive down prices, but with the floor in place, prices cannot go below the legally prescribed level. This can have the effect of providing the alcohol industry with windfall profits. It may also result in lower tax revenue as people consume less alcohol but without any increase in tax rates. In contrast, tax rises have the potential to lower alcohol intake but without large costs to the public purse and without providing windfall profits to the alcohol industry.

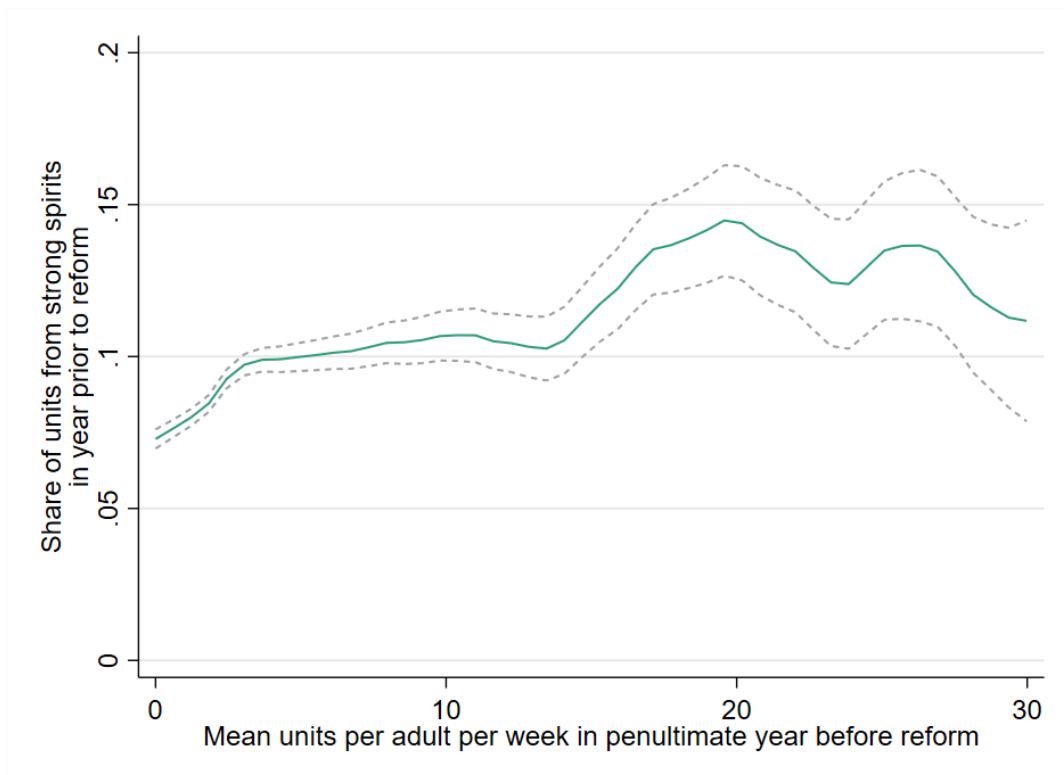
The current system of alcohol duties in the UK is incoherent – see Figure 4.1 later. Rates vary across cider, wine, beer and spirits and by alcoholic strength in a chaotic manner. This is not entirely a choice made by UK governments: EU regulations require that cider and wine are taxed per litre of product sold, and not in proportion to alcoholic strength. In light of the UK's departure from the EU, the government is currently consulting on possible reforms to the system of alcohol duties.

The simplest system of alcohol duties would have a single tax rate levied per unit of alcohol. If every unit of alcohol drunk created the same costs to society, then setting the tax rate equal to this social cost per unit would be the best policy.

However, it is much more likely that the social costs associated with a drink are higher for people who drink a lot than for lighter drinkers. It is difficult to design a tax system where the tax rate per unit of alcohol varies across heavy and light drinkers. However, there can be benefits from more heavily taxing alcohol products

preferred by heavy drinkers. If heavy drinkers prefer, say, strong spirits, a taste for strong spirits acts as a ‘tag’ for being more likely to be a socially costly drinker. This is an idea first proposed in the context of the design of income tax and benefit policy by the Nobel-Prize-winning economist George Akerlof, where certain attributes of individuals can be used as a way to channel public funds to the neediest groups (Akerlof, 1978). Figure 3.1 shows that heavier drinkers get a greater share of their units from high-strength spirits. In previous work (Griffith, O’Connell and Smith, 2019), we find that taxing high-strength spirits by more than lower-strength beer, wine and cider can lead to a tax system that more effectively targets heavy drinkers, compared with one that taxes all units of alcohol equally.

Figure 3.1. Share of units from strong spirits across the distribution of drinkers



Note: The figure shows the share of units from spirits with an ABV of more than 40% over the period May 2017 to April 2018 in England and Scotland combined, by the mean units purchased per adult per week over the period May 2016 to April 2017. The dashed lines show 95% confidence intervals.

Source: Authors’ calculations using data described in Griffith, O’Connell and Smith (2020).

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We therefore consider a reform that combines the principles of taxing all products per unit of alcohol and setting a higher rate on strong spirits. Specifically, we consider a two-rate tax system that sets a low rate on products with up to 20% ABV and a higher rate on products with more than 20% ABV. We assess the impact that such a reform would have in isolation and if it were combined with a minimum unit price.

4. Comparing taxation and minimum pricing

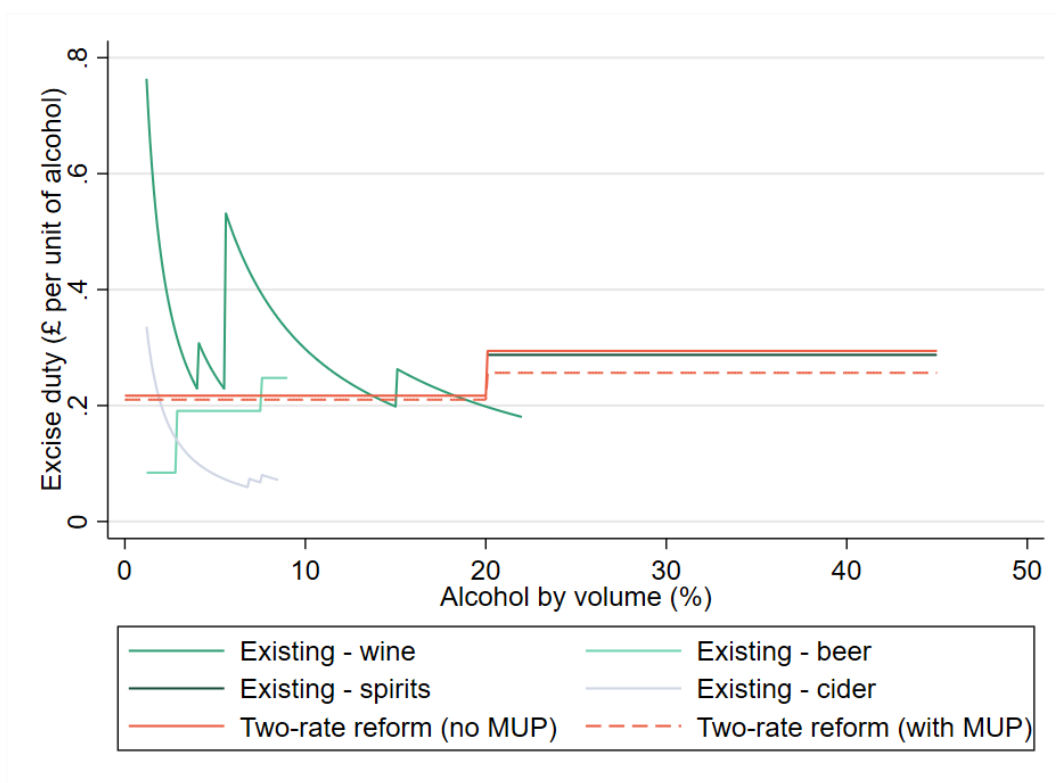
We compare the effects of three reforms:

1. introducing a minimum unit price for the whole UK (keeping the existing UK system of alcohol duties);
2. replacing the existing system of alcohol duties with the two-rate tax system described above;
3. introducing the minimum unit price in conjunction with the two-rate tax system reform.

In each case, we measure the impact of the reform relative to what people buy under the UK system of alcohol duties with no minimum unit price in place. We choose a minimum unit price level comparable to that introduced in Scotland in 2018. Under reforms 2 and 3, we choose the tax rates so that the reduction in average units purchased per adult are the same as under reform 1 (and therefore the tax rates are slightly lower in reform 3 – since this comes with a minimum price – than under reform 2). We compare how effectively targeted the policies are at heavier drinkers, as well as their impact on tax revenue and industry revenue.

Figure 4.1 shows the current system of UK tax rates, the two-rate reform (without the minimum unit price) and the two-rate reform (with the minimum unit price). The two-rate reform substantially increases the tax rate for cider above 3% ABV, bringing it into line with the tax levied on beer. The two-rate reform (without the minimum unit price) would lead to just over a 2p increase in the average duty per unit.

Figure 4.1. Alcohol tax rates under different policy reforms



Note: The green lines show the duty per unit for wine (still), cider (still), beer and spirits in 2020. The red lines show the two-rate reform, with the solid line showing the rate when no minimum unit price is applied and the dashed line showing the rates when we apply the minimum unit price (MUP). The analysis is conducted on data from 2011. The rates for the two-rate reforms have been updated using the Consumer Prices Index (CPI) to account for inflation since 2011.

How we compare the effects of different policies

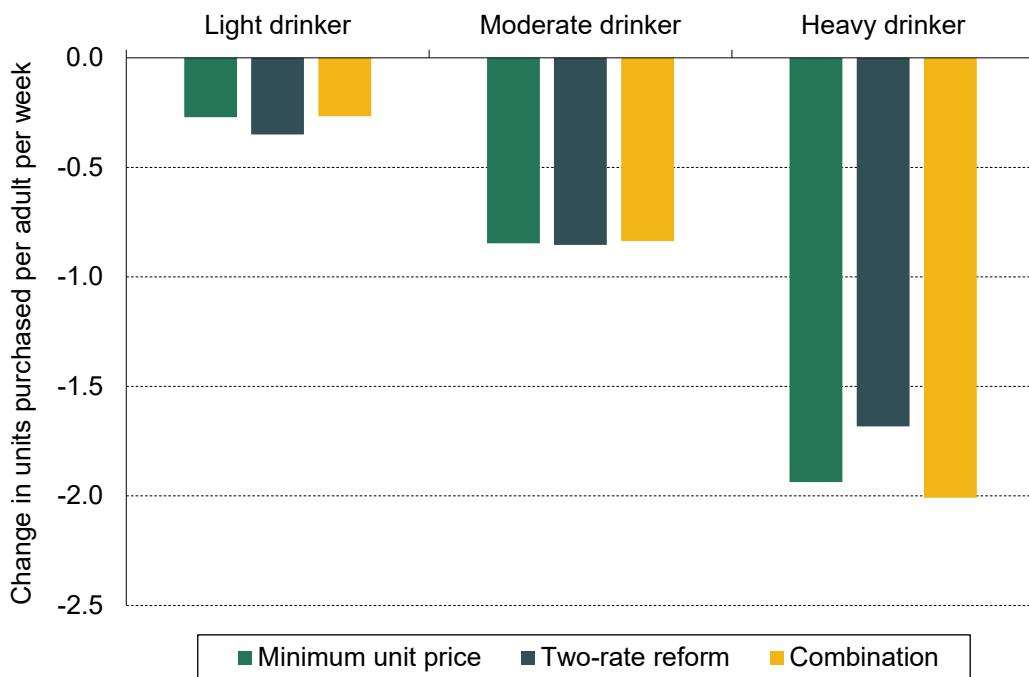
Unlike the minimum unit price, which we observe in reality, the tax reform we investigate is hypothetical. This means that we need a model of how households choose what alcohol to buy in order to predict how they would respond to such a tax reform. To do this, we use estimates of a model of people's choices between different types and sizes of alcohol products based on data from 2011, which are described in detail in Griffith, O'Connell and Smith (2020).

In Griffith, O'Connell and Smith (2020), we show that this model does a good job of predicting how people respond to price changes by comparing the model's predictions for the impact of the minimum unit price with the observed impact we see in Scotland (described in Section 2).

How well targeted are the reforms at heavy drinkers?

Figure 4.2 shows the change in units purchased per adult per week under the three policy reforms, relative to the existing system of taxes. The figure shows that all three reforms lead to larger declines in units purchased by heavy drinkers compared with light drinkers. This suggests that all the policies are reasonably well targeted at the most socially costly alcohol consumption.

Figure 4.2. Change in units purchased under different policy reforms



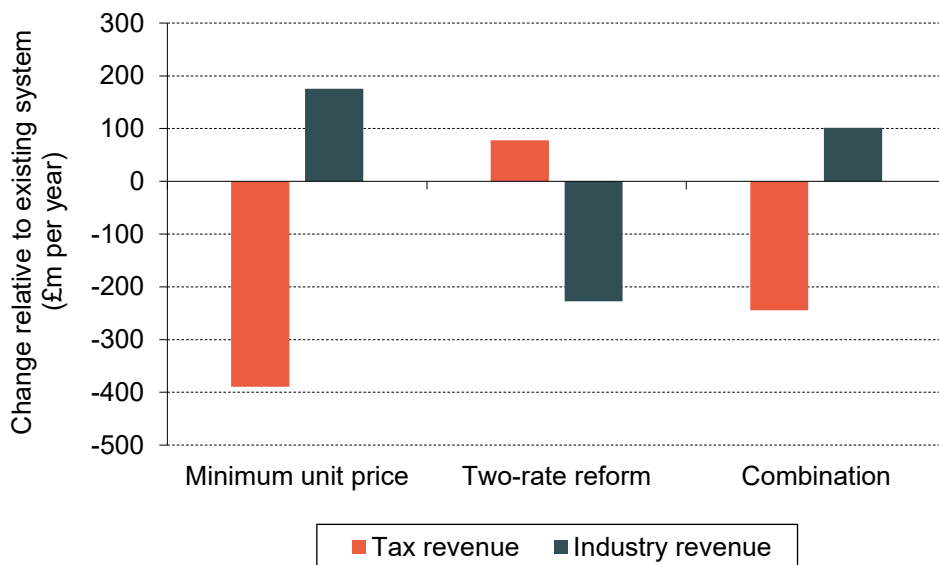
Note: The bars show the change in units purchased per adult per week under three alternative reforms relative to the current system of UK alcohol taxation. Light drinkers are those who buy less than 7 units per adult per week in a pre-sample period, moderate drinkers are those who buy 7–14 units, and heavy drinkers are those who buy more than 14 units.

The two-rate tax reform is slightly less well targeted at heavy drinkers than the minimum unit price, with the latter leading to slightly larger falls in the units purchased by heavy drinkers. The combination of the two reforms is better targeted than the two-rate tax reform, and as well targeted as the minimum unit price applied to the existing system of alcohol duties. However, the differences across the three reforms are small.

What's the impact on tax revenue and industry revenue?

Figure 4.3 shows the impact of the three policy reforms on tax revenue (alcohol duties and VAT together) and industry revenue. The reforms differ more along these margins than they do in terms of their targeting.

Figure 4.3. Change in tax revenue and industry revenue under different policy reforms



Note: The red bars show the estimated change in annual tax revenue (£ million) relative to the existing system of alcohol duties under the three policy reforms. Tax revenue includes alcohol duty and the VAT levied on alcohol purchases. The blue bars show the change in industry revenue under the three reforms.

The minimum unit price applied to the existing tax system leads to a fall in tax revenue of £390 million per year and an increase in industry revenue of more than £175 million per year.² Conversely, the two-rate reform leads to an increase in tax revenue of over £70 million per year.³ The combination of two-rate reform and a minimum unit price leads to a fall in revenue, but this decline is a third smaller than the decline under the minimum unit price. Thus, combining the minimum unit price with a sensible tax reform leads to better-targeted policy *and* a smaller decrease in tax revenue.

² It is likely that part of this increase in industry revenues will be from higher profits, which, in turn, will lead to an increase in corporation tax receipts. However, any increase in tax revenue through this channel is likely to be much smaller than the direct loss in tax revenue from alcohol duties and VAT. For example, if all of the industry revenue increase represents profits and was taxed at the UK corporation tax rate of 20%, this would lead to additional corporation tax receipts of £35 million per year.

³ Our simulations are based on data for 2011. We uprate revenue figures to 2019 using the alcohol component of the Consumer Prices Index.

5. Discussion

In this briefing note, we show that the introduction of a minimum unit price for alcohol in Scotland was effectively targeted at reducing the alcohol purchases of heavy drinkers. However, we also estimate that it reduced tax revenue and increased revenues flowing to the alcohol industry.

A reform that replaces the current, complex system of alcohol duties with a simple two-rate structure that taxes high-strength products more strongly than low-strength ones leads to a similar reduction in units purchased across different types of drinkers. It is slightly less well targeted at the purchases of heavy drinkers, but, unlike the minimum unit price, leads to an increase in tax revenue.

The choice between these policy alternatives ultimately depends on how the government weighs tax revenue versus the social costs from alcohol consumption.

However, we show that even if the government is happy to accept the fall in tax revenue as the price to pay for reducing the alcohol purchases of heavy drinkers by more, it remains worthwhile to reform the tax system *before* introducing a minimum unit price. The combination of a simple tax reform and a minimum unit price is just as well targeted as applying the minimum unit price to the current tax system but leads to a much smaller drop in tax revenue.

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