

9. Excise duties

Peter Levell, Martin O’Connell and Kate Smith (IFS)

Summary

- Excise taxes on tobacco, fuel and alcohol comprise 7.2% of total receipts, which is a large share by international standards. However, revenues from these duties have already fallen from 10.3% of receipts in 1978–79 and are forecast to fall to 6.0% of receipts by 2020–21. Had these duties maintained their 1978–79 share of national income, they would be raising £26 billion more than they currently raise.
- Specific taxes on these goods are justified by the costs their consumption imposes on others (externalities) and/or costs on the consumer themselves that they may not fully take into account when making their consumption decision (internalities). Taxes should seek to target the externality- or internality-generating activity and should be set based on the incremental social harm associated with consumption.
- Real cuts to rates of fuel duties, combined with recent falls in oil prices and improving vehicle fuel efficiency, have pushed the average cost of driving a new vehicle a kilometre to its lowest level since at least 1997. The main social cost from motoring is congestion and this is rising. This suggests the price of motoring has not been tracking its social cost. Petrol and diesel duty increases of 41% and 31% respectively would return the average cost of driving a new vehicle to its 1997 level and raise £9 billion a year. However, fuel duties are poorly targeted at congestion; the government should move towards a system of road pricing.
- The current structure of alcohol duties is not well targeted at harmful alcohol consumption. As heavy drinkers tend to consume stronger alcoholic drinks, reversing the long-run trend towards lower spirits duties would target the system better at them. Action to tackle the very low levels of duty charged on strong cider would also make sense: a litre of 7.5% ABV beer is liable for duty of 138p, while a litre of 7.5% ABV cider attracts duty of only 39p. Changes of this nature should take precedence over imposing minimum prices, which has legal obstacles and which would likely result in windfall profits for drinks companies.
- There is also potentially a case for higher taxes on particular foods associated with diet-related disease. There have been calls for a tax on sugar, and sugar-sweetened soft drinks in particular. But the issues are more complex than may initially appear.
- A sugary soft drinks tax is likely to lead consumers to switch away from taxed products, but the efficacy of the policy will depend on what products they switch to and how firms change their prices. Some consumers might switch to chocolate, for example, which is also high in sugar and contains saturated fat to boot. Some manufacturers and/or retailers might respond to the tax by increasing the prices of diet drinks, dampening the extent of any consumer switching to these products.
- An alternative policy would be to levy a broad-based sugar tax. This would have the advantage of targeting all sources of dietary sugar. However, the effect of such a tax on consumption of other nutrients, and hence overall diet, is highly uncertain.

9.1 Introduction

Excise duties¹ make a significant contribution to UK government revenues. In 2014–15, the duties levied on fuel, tobacco and alcohol raised £47 billion, comprising 7.2% of total receipts.² However, the future of these taxes is uncertain. Revenues from existing duties are set to decline in coming years, and new planned and proposed regulations, such as plain packaging for cigarettes and minimum pricing for alcohol, would be likely to act to accelerate this process if enacted. At the same time, public health bodies have proposed introducing new duties on foods and beverages with high sugar contents. In this chapter, we consider the current structure of excise duties and the principles that should underpin them. We argue that current duties are not always well designed and we raise similar concerns with regard to proposed sugar taxes. Overall, there is a need for a clear long-term strategy for this part of the tax system, informed by economic principles and empirical evidence.

The chapter is structured as follows. We start in Section 9.2 by outlining the case for excise duties in the first place: given the existence of the broad-based value added tax (VAT), what justification is there for levying excise duties? Section 9.3 discusses trends in, and the current structure of, duties for tobacco, motoring and alcohol. It also makes the case for reform of fuel and alcohol duties. Section 9.4 discusses proposals for a new tax on certain goods with high sugar content. We offer concluding thoughts in Section 9.5. First, we look at the amount of revenue excise duties raise.

How much revenue do duties raise?

Table 9.1 reports how much revenue was raised from duties on tobacco, motoring and alcohol and the share of total receipts from each of these sources in 2014–15. Tobacco duties raised £9.3 billion (1.4% of total receipts) and duties on alcohol raised £10.5 billion (1.6% of total receipts). Revenue from duties applied to motoring are considerably larger; fuel duties raised £27.2 billion (4.2% of total receipts) and vehicle excise duties (VED) raised £5.9 billion (0.9% of total receipts).

While our focus in this chapter is on duties levied on tobacco, motoring and alcohol, note that an additional set of duties including air passenger duty, betting and gaming duties and the insurance premium tax collectively raised a further £8.3 billion (1.3% of total receipts) in 2014–15.

Figure 9.1 shows how revenues from these duties, expressed as a percentage of national income, have changed over time. Revenues from fuel duties peaked at 2.3% of national income in 1998–99, before falling back to 1.5% in 2014–15. Revenues from this source have largely followed rates of duty (see Figure 9.7 later). Revenues from tobacco duties (as a share of national income) have been in steady decline despite the large increases in rates that have been introduced over this period (see Figure 9.5 later). As we discuss in Section 9.3, this reflects the long-term decline in the proportion of individuals who smoke. Revenues from alcohol duties have declined in importance at a similar rate to

¹ Excise duties (or taxes) are typically levied on particular goods, and are distinct from broad-based indirect taxes, such as value added tax. Typically, they are ‘specific’ taxes (levied as a fixed absolute amount per unit); however, in some cases, they also have an *ad-valorem* component (proportional to price).

² Table D.6 of HM Treasury, *Spending Review and Autumn Statement 2015*, November 2015, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/479749/52229_Blue_Book_PU1865_Web_Accessible.pdf.

revenues from tobacco duties over this period, though for different reasons. Alcohol consumption has not fallen in the same way as tobacco consumption, but rates of duty on some alcoholic drinks have fallen over time (see Figure 9.10 later). Revenues from all three of these excise duties are forecast to decline further in the coming years, taking the total ratio of revenue to national income from these taxes down from a high of 4.1% in 1983–84 to 2.6% in 2014–15 and 2.2% by 2020–21. Had they maintained their 1978–79 share of national income, they would now be contributing an additional £26 billion to the

Table 9.1. Tax revenue contributions, 2014–15

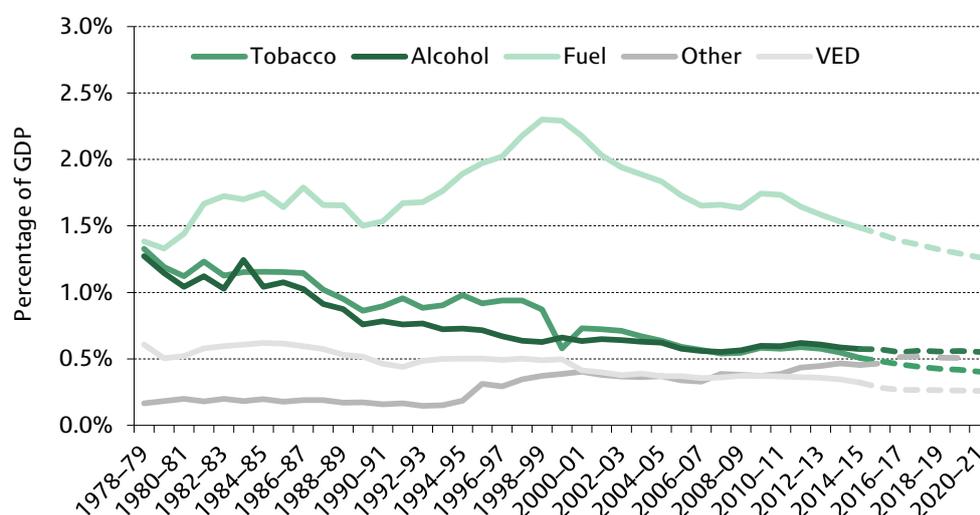
	Revenue (£ billion)	Share of total receipts (%)
Tobacco duties	9.3	1.4
Fuel duties	27.2	4.2
Vehicle excise duties	5.9	0.9
Beer and cider duties	3.7	0.6
Spirits duties	3.0	0.5
Wine duties	3.8	0.6
Other duties	8.3	1.3

Note: Other duties comprise air passenger duty, insurance premium tax, and betting and gaming duties.

Source: HM Treasury, *Spending Review and Autumn Statement 2015*, November 2015,

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/479749/52229_Blue_Book_PU1865_Web_Accessible.pdf; Office for Budget Responsibility, *Economic and Fiscal Outlook*, November 2015, <http://budgetresponsibility.org.uk/economic-fiscal-outlook-november-2015/>.

Figure 9.1. Revenue from duties as a percentage of national income, 1978–79 to 2020–21



Note: Dashed lines indicate forecasts. 'Other' includes revenues from air passenger duty, insurance premium tax, and betting and gaming duties.

Source: IFS Fiscal Facts, http://www.ifs.org.uk/tools_and_resources/fiscal_facts/; HM Treasury, *Budget 2015*, March 2015,

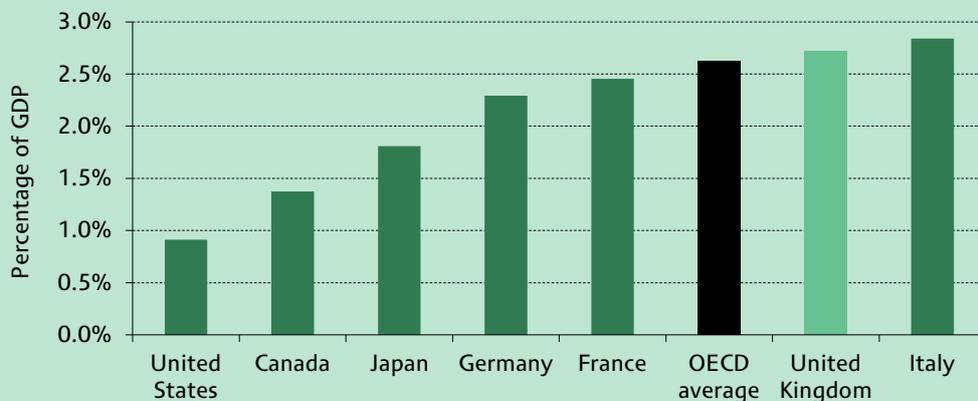
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/416330/47881_Budget_2015_Web_Accessible.pdf; HM Treasury, *Spending Review and Autumn Statement 2015*, November 2015, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/479749/52229_Blue_Book_PU1865_Web_Accessible.pdf; Office for Budget Responsibility, *Economic and Fiscal Outlook*, November 2015, <http://budgetresponsibility.org.uk/economic-fiscal-outlook-november-2015/>.

Box 9.1. UK excise duties in an international context

The UK stands out in having high rates of excise duties relative to other developed countries. In 2014, the UK had the fourth-highest tobacco duty rates among comparable countries in the Organisation for Economic Cooperation and Development (OECD) and the second-highest in the European Union (behind Ireland). In 2014, only five OECD countries (Israel, Italy, the Netherlands, Norway and Turkey) had higher rates of fuel duties. The UK also had the fourth-highest excise duties on still wine (which in many countries is not subject to an excise duty at all) among 28 comparable countries and the fourth-highest duty on beer among 18 comparable countries.^a

These differences mean that duties in the UK are unusually large relative to GDP. Figure 9.2 shows total revenues from excise duties on tobacco, fuel and alcohol, as a proportion of national income, for countries in the G7. In the UK, revenues from these duties make up a larger proportion of GDP than in any other member of the G7 countries, with the exception of Italy, and are above the OECD average.

Figure 9.2. Revenues from excise duties across G7 countries, 2013



Note: Covers excise duties on tobacco, fuel and alcohol.
Source: Organisation for Economic Cooperation and Development.

^a OECD, *Consumption Tax Trends 2014*, December 2014, <http://dx.doi.org/10.1787/ctt-2014-en>.

public finances – a gap that will have widened to £41 billion by 2020–21. Nevertheless, despite declines in revenues, these duties still make up a large share of GDP in the UK relative to other developed countries (see Box 9.1). Figure 9.1 shows that revenues from vehicle excise duties, as a share of national income, have also been gradually falling over time, while revenues from other duties have been rising from a low base.

The value of revenues raised from duties on tobacco, fuel and alcohol has fallen not only as a share of national income but also relative to other sources of revenue. Revenues from these duties fell from 10.3% of total receipts in 1978–79 to 7.2% in 2014–15. They are forecast to fall further to 6.0% of receipts by 2020–21.

There have been a number of policy announcements since the 2010 general election that have had implications for revenues from excise duties. According to official estimates, the cumulative effect of all changes in duties from 2010 has been to lower expected tax receipts in 2015–16 by £2.5 billion.³ This revenue loss is driven by the £4.0 billion in lost

³ Figures are based on calculations using the Office for Budget Responsibility’s Policy Measures Database (downloaded from <http://budgetresponsibility.org.uk/data/> on 31 January 2015) and various HM Treasury Budget, Autumn Statement and Pre-Budget Report documents.

revenue associated with freezes in fuel duties. This has, to some extent, been offset by policy changes that have led to increases in revenues from vehicle excise, tobacco and alcohol duties of £0.1 billion and an increase in revenues of £1.4 billion from the set of other excise duties (primarily changes to insurance premium tax and betting and gaming duties).⁴

9.2 Principles of excise taxation

There are a number of possible justifications for levying excise duties. The first is as a means of raising revenue. However, by itself, this is a weak justification for levying especially high taxes on a small number of goods, such as tobacco, fuel and alcohol. When designing a tax system to raise a target amount of revenue, the government should seek to minimise the distorting effects on consumers' behaviour unless there is a specific reason to encourage change. In particular, as long as consumption does not have direct consequences for other people or for the consumer in the future (that he or she fails to fully take into account), economic efficiency weighs strongly in favour of having commodity tax rates that are uniform across goods.⁵ In the absence of a specific reason for discouraging tobacco, fuel or alcohol consumption, levying especially high taxes on these goods is difficult to motivate on economic grounds.

A second more convincing justification is that consumption of these goods imposes costs on others ('externalities') and/or costs on the consumer in the future ('internalities') that they may not fully appreciate or take into account when making their consumption decision. Taxation can, in these circumstances, discourage the excessive consumption that would occur in its absence. Taxes introduced with this purpose are known as corrective or 'Pigouvian' taxes.

Externalities may take a number of forms. Consumption of a good can confer direct costs to other people in close proximity, such as victims of passive smoking or of alcohol-fuelled physical abuse. Externalities may also be borne collectively by the population – for instance, the cost of publicly-funded medical treatment for smoking-, alcohol- and pollution-related disease. A third type of externality operates through the tax system. In the absence of an income tax system, lost earnings associated with sickness would primarily be borne by the consumer and therefore would not count as an externality. However, the associated loss in income tax revenue (and possible increase in benefit payments) over the consumer's lifetime does convey external costs as it leads to lower

⁴ The government also levies a set of environmental taxes. While these taxes are not generally considered as duties – for instance, being outwith the set of taxes classified as duties by the OECD – they do share similarities with excise duties, being levied as specific taxes on certain activities. Environmental taxes include the climate change levy, the aggregates levy and landfill tax. In 2014–15, they raised £3.1 billion. The revenue contribution of these taxes has been increasing over time; policy decisions made since 2010 have led to these taxes generating an additional £1.7 billion by 2015–16.

⁵ High levels of taxation for specific commodities are often thought to be justified by the 'inverse-elasticity rule' – high taxes on goods with inelastic demand do not reduce demand by much, and therefore cause little distortion in behaviour, while providing a strong source of revenue. This intuition is misleading, as it is based on the assumption of no income tax, homogenous consumers and no cross price effects. In more realistic models, differential commodity taxes are justifiable only on the basis of differences in how complementary goods are with leisure (or on the basis of externalities or internalities). Given the challenges associated with measuring these complementarities, most economists argue for the benchmark of uniform commodity taxation with deviations from this perhaps justifiable in a few particular cases (e.g. lower tax on childcare). For a fuller discussion, see I. Crawford, M. Keen and S. Smith, 'Value added tax and excises', in J. Mirrlees, S. Adam, T. Besley, R. Blundell, S. Bond, R. Chote, M. Gammie, P. Johnson, G. Myles and J. Poterba (eds), *Dimensions of Tax Design: The Mirrlees Review*, Oxford University Press for Institute for Fiscal Studies, Oxford, 2010, <http://www.ifs.org.uk/publications/7184>.

public revenues. When considering the extent of externalities borne collectively by the population or through the tax system, it is important to also factor in reduced spending such as on state and public service pensions associated with people undertaking activities that lead to them dying prematurely.

Internalities are similar to externalities in the sense that the consequences of consumption are not accounted for by the consumer at the time of consumption. However, while the consequences associated with externalities are borne by others, the consequences of internalities are borne by the consumer in the future. Internalities may arise because a consumer is ill informed about the possible effects of their current behaviour – for example, consumers may not know how their alcohol consumption affects the likelihood of developing liver disease in the future. They may also arise in the case of fully-informed consumers who understand future consequences but simply fail to factor them fully into their current decisions – perhaps because of some form of dependence or addiction. The large industry in smoking cessation products is evidence for the existence of such self-control problems.

In the presence of either externalities or internalities, and in the absence of government intervention, individuals will tend to consume a socially excessive quantity; they will choose to consume the quantity of a good that equates their own perceived marginal benefit from consumption to the perceived marginal cost to themselves (which includes the price paid for the good), not taking account of costs imposed on others or any internalities imposed on themselves in the future. The case for taxation rests on discouraging socially harmful consumption by aligning the perceived private marginal costs of an activity with its actual social costs. An externality- or internality-correcting tax raises the price of a good by the amount of the marginal externality or internality, thereby leading consumers to take account of the full marginal cost associated with their behaviour. Of course, such a tax may also raise revenue; however, this should be secondary to the tax's principal purpose of discouraging socially excessive consumption.

The design of corrective taxes

While in principle the role of an externality- (or internality-)correcting tax is clear, designing the structure and deciding on the rate of such a tax can be challenging. In determining the tax rate, it is the *marginal* externality (or internality) that is relevant – what, for instance, is the incremental social cost associated with having an additional pint of beer in an evening? In some cases, as discussed further in Section 9.3, externalities (or internalities) are likely to be highly non-linear in quantity consumed: the marginal social cost of the tenth pint of the evening is probably very different from the marginal social cost of the first. In addition, these costs are likely to vary significantly across people; for a given level of intoxication, some individuals are likely to be more prone to alcohol-related abuse than others. In the case of alcohol, it is ultimately excessive consumption leading to serious drunkenness in individual episodes or alcoholism over time that is the prime source of externality or internality, while the social costs of moderate consumption are significantly lower. This means the marginal externality (or internality) is likely to differ sharply from the average. In any case, even estimating *average* social costs is difficult. These considerations make it hard to set excise duties at their optimal rates. However, a few broad principles stand out that can be useful in guiding policymakers towards an appropriate design for corrective taxes.

The first is that corrective taxes should target the externality- or internality-generating behaviour as directly as possible. This can be difficult. For example, in the case of

externalities associated with alcohol, it is often the abusive behaviour associated with some consumers' consumption episodes that creates problems. Tax levied on beer (consumption of which creates little or no externalities most of the time) is quite far removed from the ultimate harm. However, in other cases, it is conceptually easier to target the harm-inducing behaviour directly with a tax, but regulation often prevents the implementation of such a tax. For example, in order to reduce CO₂ emissions associated with air travel using the tax system, governments would ideally levy a tax directly on emissions. However, this is prohibited under international agreements. Instead, the UK government has chosen to tax airline passengers in a manner very loosely related to flight distance, which does not give passengers very strong incentives to choose short over more polluting long-haul flights. The tax also fails to encourage innovation in the form of the development of more-fuel-efficient flight paths or aircraft, or the use of these technologies where they are available.

The second principle is that governments should not hesitate to set corrective taxes above the revenue-maximising rate if the targeted activity is particularly harmful. If revenue raising is the sole objective, setting a tax rate above the level at which revenue from the tax is maximised (above the 'Laffer' rate) does not make sense. However, for corrective taxes, rates should be set according to the marginal social damage caused by the associated activity, and indeed the aim of the tax can be seen as (at least partially) to erode its own revenue base by discouraging certain activities.

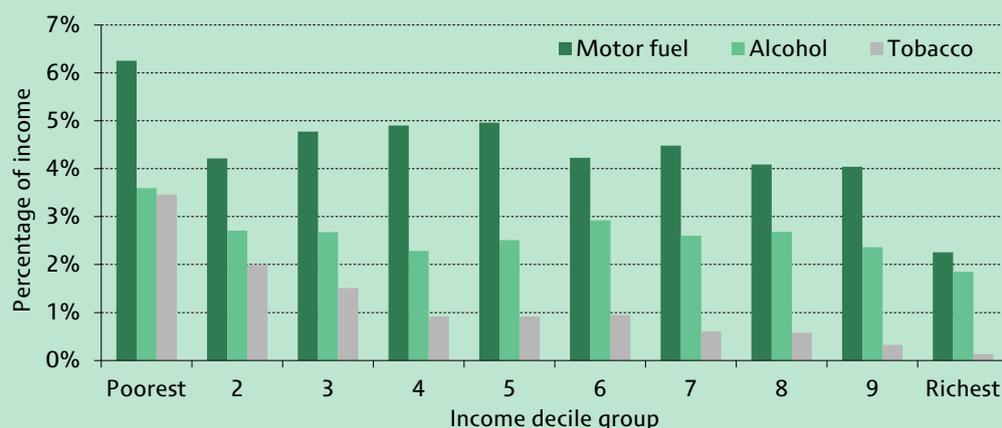
A final principle concerns the question of redistribution. A common objection to the use of excise duties as corrective taxes is that they are regressive. However, this does not provide a strong argument against setting rates to fully correct externalities and internalities. What matters for meeting distributive goals is the distributional impact of the tax and benefit system as a whole, not the progressivity or regressivity of any single tax. In general, policymakers should seek to meet distributive goals through adjustments to the income tax and benefit system, and should primarily focus excise taxes on targeting market failures. Of course, understanding the distributional impact of excise taxes can be important in determining how to adjust other aspects of the tax and benefit system to offset excise tax reforms that on their own would be regressive. As we argue in Box 9.2, the distributional impact of excise taxes is somewhat more ambiguous than simple characterisations would suggest.

Box 9.2. Are excise taxes regressive?

The distributional impact of taxes is often examined using a graph such as Figure 9.3. This shows how consumer spending on motor fuel, alcohol and tobacco varies as a proportion of current consumer income across the income distribution. Those in the lowest income deciles do, on average, spend more on these goods relative to their incomes. This pattern is particularly pronounced for tobacco.

This picture, however, can be misleading for at least two reasons. First, some consumers with low levels of current income may have access to other resources, such as wealth accumulated in the past or borrowing in anticipation of higher future income. These consumers may not be poor in any meaningful sense and may spend a lot in total relative to their current income. Ideally, we would like to know what fraction of consumers' total lifetime income they spend on each good. Second, in addition to consumer spending on motor fuel, a considerable fraction of total fuel spending is likely to be made by firms. This spending is likely to be, at least in part, passed on to consumers as higher prices. This portion of the incidence of motor fuel duty is not reflected in Figure 9.3.

Figure 9.3. Shares of income devoted to fuel, alcohol and tobacco by income decile

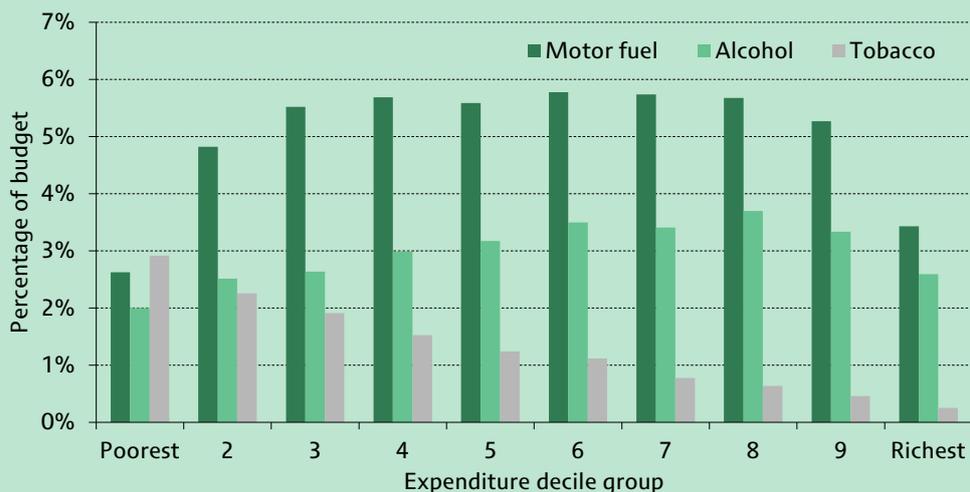


Note: Income decile groups are derived by dividing all households into 10 equal-sized groups according to income adjusted for household size using the modified OECD equivalence scale. Decile group 1 contains the poorest tenth of the population, decile group 2 the second poorest, and so on up to decile group 10, which contains the richest tenth.

Source: Living Costs and Food Survey 2013.

An alternative way of assessing the distributional impact of these taxes, which may proxy for lifetime income better, is to consider the shares of total *spending* (not income) devoted to these items and to compare these shares for high and low spenders. Doing this leads to a different picture (shown in Figure 9.4). Those in the poorest (i.e. lowest expenditure) decile actually devote the smallest proportion of their budgets to motor fuel and alcohol. The largest budget shares for fuel are in the middle of the distribution, while across deciles 1 to 8 the share spent on alcohol tends to increase with total spending, suggesting it is a luxury good. However, the poorest tend to spend a larger share of their expenditure on tobacco.

Figure 9.4. Shares of spending devoted to fuel, alcohol and tobacco by expenditure decile



Note: Expenditure decile groups are derived by dividing all households into 10 equal-sized groups according to total expenditure adjusted for household size using the modified OECD equivalence scale. Decile group 1 contains the poorest tenth of the population, decile group 2 the second poorest, and so on up to decile group 10, which contains the richest tenth.

Source: Living Costs and Food Survey 2013.

An additional consideration should also be taken into account when thinking about the progressivity and regressivity of taxes that can help to correct externalities. The impact of these taxes depends not only on how much poorer or richer consumers spend on these goods but also on the degree to which the taxes help correct their externalities. As we have seen, there is an argument for taxation of these goods on the grounds that they provide benefits to consumers with self-control problems. If the self-control benefits of taxation are greater for poorer consumers, this could adjust or even reverse perceptions of the distributional impact of the tax based on traditional notions of spending patterns. In one paper, Gruber and Koszegi (2004) argue that, other things equal, the self-control benefits of cigarette taxes will be greater for those whose consumption is more price sensitive as they will reduce their overconsumption of tobacco by more when taxes rise. This price responsiveness turns out to be much larger for those at the lower end of the income distribution. Taking this into consideration, the authors find that the estimated regressivity of tobacco taxes in the United States is greatly reduced and that cigarette taxes may even be progressive.^a

^a J. Gruber and B. Koszegi, 'Tax incidence when individuals are time-inconsistent: the case of cigarette excise taxes', *Journal of Public Economics*, 2004, 88, 1959–87.

9.3 Current excise duties

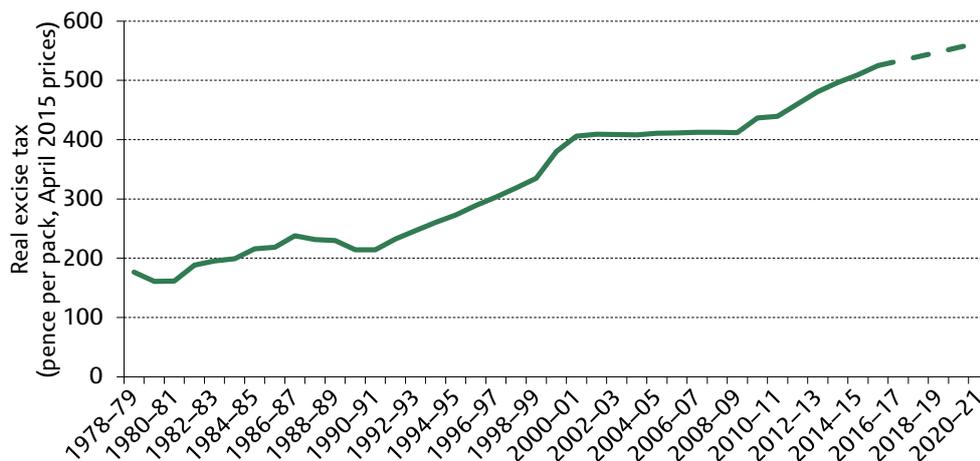
In this section, we discuss the current rates and structures of duties applied to tobacco, motoring and alcohol in the UK and how well these target the externalities and externalities associated with smoking, motoring and drinking.

Tobacco duties

Cigarette taxation in the UK consists of both a specific (£3.79 for a pack of 20 cigarettes in 2015) and an *ad-valorem* component (16.5% of the retail pack price). Other tobacco products such as cigars and hand-rolled tobacco are subject to their own specific duties. In addition to these, VAT is charged at a rate of 20% on the pack price (inclusive of the specific component of the duty). Thus, a 1p increase in the specific component of duty currently results in an increase of 1.4p of total tax (including VAT) liable.

The real value of total duty (including both the specific and *ad-valorem* components) charged on a packet of 20 cigarettes has grown quite considerably over time, as Figure 9.5 shows. Total duties more than doubled from £2 per pack in 1990 to over £5 in 2015. This is a consequence of explicit tobacco duty 'escalator' policies that have been introduced at various times. Between 1993 and 2000, the specific component of duty was increased initially by 3% above inflation (as measured by the Retail Prices Index (RPI)) and 5% from July 1997. In 2001, the government stopped the escalator and froze duties in real terms. In December 2008, the specific component of duty rates increased to 'offset' a temporary reduction in the rate of VAT from 17.5% to 15% enacted as a fiscal stimulus (though this increase was not reversed when VAT rates rose again in January 2010). Real specific duties then rose by 1% in 2010, and another escalator was introduced of 2% above RPI increases until 2014. In 2014, this was then extended to cover the whole of the following parliament. Tobacco duties accounted for £9.3 billion in revenue in 2014–15, representing 1.4% of total receipts.

Figure 9.5. Real tobacco duties, 1978–79 to 2020–21



Note: Converted to April 2015 prices using the RPI. Figures show total excise duty (including both the specific and *ad-valorem* components) paid on a packet of 20 cigarettes. Dashed line indicates announced future policy. To calculate the specific rate of duty in future years, it is assumed that cigarette prices increase in line with forecast growth in the RPI.

Source: Duty rates – HMRC website, <https://www.gov.uk/government/organisations/hm-revenue-customs>; HM Treasury, *Tax Benefit Reference Manual 2002–03 Edition*, 2002; various HMRC / HM Customs & Excise Annual Reports. RPI from Office for National Statistics and RPI forecasts from Office for Budget Responsibility, *Economic and Fiscal Outlook*, November 2015, <http://budgetresponsibility.org.uk/economic-fiscal-outlook-november-2015/>.

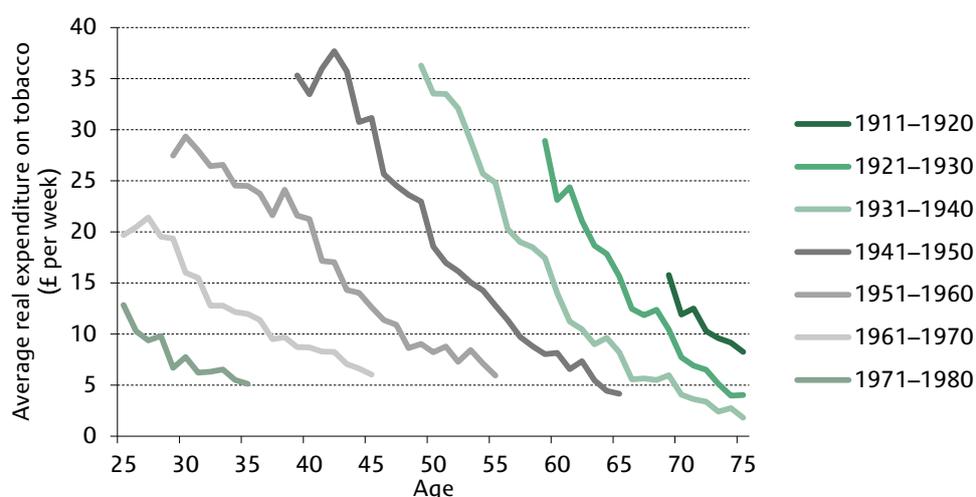
Despite the increases in tobacco duties that have been pencilled in, revenues from tobacco duties are expected to fall in real terms to £8.5 billion in 2020–21.⁶ This reflects an expected continuation of a long-term decline in the proportion of individuals who smoke: Office for National Statistics (ONS) figures suggest that the proportion of males aged over 16 who smoke has fallen from 51% in 1974 to 22% in 2013, while the figure for females has fallen from 41% to 17%.⁷ Indeed, there is good reason to expect these declines to continue. Tobacco consumption among younger individuals today is substantially lower than it was among previous generations at the same ages. Figure 9.6 shows tobacco spending of different birth cohorts (individuals born within the same period – in this case, the same decade) at the different ages they are observed over the period 1978–2013. Spending here is measured by dividing cash expenditures by an index for the price of tobacco taken from the RPI. For all cohorts, tobacco spending tends to fall as individuals get older, but it is also clear that spending at a given age is lower for those born later.⁸ This suggests that as members of older cohorts die in the coming years, total tobacco consumption is set to decline further. Trends such as these may also be accelerated in future by the development of substitutes for tobacco smoking such as ‘vaping’.

⁶ Revenues taken from HM Treasury, *Spending Review and Autumn Statement 2015*, November 2015, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/479749/52229_Blue_Book_PU1865_Web_Accessible.pdf, deflated using the GDP deflator.

⁷ Figure 2 in Office for National Statistics, ‘Opinions and Lifestyle Survey: adult smoking habits in Great Britain, 2013’, Statistical Bulletin, November 2014, http://www.ons.gov.uk/ons/dcp171778_386291.pdf.

⁸ This pattern may in part be explained by known declines in the amount of total household spending captured by the Living Costs and Food Survey, but the broad pattern accords with evidence from other sources – see figure 4 in Office for National Statistics, ‘Opinions and Lifestyle Survey: adult smoking habits in Great Britain, 2013’, Statistical Bulletin, November 2014, http://www.ons.gov.uk/ons/dcp171778_386291.pdf.

Figure 9.6. Real expenditure on tobacco by age and birth cohort, 1978–2013



Note: Each line represents average real household expenditure on tobacco at each age for household heads born in one of seven 10-year intervals from 1911 to 1971 over the periods they are observed from 1978 to 2013. Real expenditures calculated by dividing household nominal expenditure on tobacco by the tobacco price component of the RPI (in 2014 prices).

Source: Authors' calculations from Living Costs and Food Survey (various years).

The shrinking revenues for tobacco taxes as smoking rates fall may partly be driven by the high rates of tobacco duties themselves. Tobacco duties now amount to 59% of the pack price of an average packet of 20 cigarettes.⁹ The decline in the number of smokers that has gone along with increases in the rates of duty naturally raises the question of whether tobacco taxes now exceed the Laffer rate at which revenues are maximised. If past and projected declines in tobacco consumption were solely driven by high duty rates, then one might indeed conclude this. However, other factors may have hastened reductions in cigarette consumption over this period. Perhaps most importantly, there has been a general increase in awareness of the dangers of smoking over the last few decades, which has most likely led more individuals to quit and fewer individuals to start smoking. Also, in recent years, the UK has been tightening regulatory restrictions on the sale and consumption of tobacco. The minimum age at which individuals may purchase cigarettes was increased from 16 to 18 in 2007. The UK has also introduced bans on smoking in public places. Bans were first introduced in Scotland from 26 March 2006, followed by Wales (2 April 2007), Northern Ireland (30 April 2007) and finally England (1 July 2007). A law enforcing standardised ('plain') packaging including health warnings for cigarettes was passed in 2015 and is scheduled to come into force in May 2016. In addition, as of 2012, large shops selling cigarettes must keep tobacco products hidden from public view.

Considering the effects of tax changes in isolation, figures from HM Revenue & Customs (HMRC) indicate that the government still expects to raise additional revenue when specific cigarette duties are increased by 1 per cent (by around £20 million).¹⁰ If correct, then tobacco duties remain below their (short-term) Laffer rate. As we discussed in

⁹ £8.86 in April 2015 according to the Office for National Statistics (series CZMP).

¹⁰ See HM Revenue & Customs, 'Direct effects of illustrative tax changes', November 2015, <https://www.gov.uk/government/statistics/direct-effects-of-illustrative-tax-changes>.

Section 9.2, however, whether the rate of tobacco duties is set too high or low relative to its revenue-maximising rate is not as important as whether the tax adequately captures the internalities and externalities of smoking. If (though only if) taxes are set appropriately, then the erosion of the revenue base is something that policymakers should consider desirable, as it implies a reduction in the harmful consequences of smoking. In this case, adjusting general taxation would be a better way to recoup lost revenue than raising or lowering tobacco duty specifically. Higher taxes eroding the revenue base further would, however, be a matter of real concern if smokers were substituting to illicit or smuggled sources of tobacco. This would not only cost the government revenue but also leave the market failures associated with smoking unaddressed. Given government estimates of the size of the illicit tobacco market, there is a real danger of this. We discuss the market for illicit tobacco further in Box 9.3 later.

Externalities of tobacco consumption

Smoking creates external costs imposed directly on people other than the smoker, which provides one rationale for levying excise duties. Such externalities include health and other costs (for example, the unpleasant experience of inhaling smoke) imposed on others through second-hand smoke. These tend to be largely borne by other members of smokers' households (the vast majority of deaths from passive smoking are believed to have been caused by smoke inhaled at home).¹¹

There may also be fiscal externalities, including lower taxes paid by smokers as a result of sick leave or shorter working lives, as well as the publicly-funded costs of treating smoking-related illnesses. Two studies of the costs smokers imposed on the NHS in 2006 and 2005–06 estimated costs of £2.7 billion and £5.2 billion (in 2006 prices) respectively.¹² However, some US-based studies suggest the costs smokers impose are more than completely offset by the reduced costs of public pensions and care for the elderly that arise because smokers tend to die prematurely.¹³ Counting these savings as 'benefits' to the public purse may seem unpalatable, but it is the logical counterpart to counting the costs that smokers impose on others.

Fiscal externalities that arise due to the health effects of smoking may be approximately targeted by taxes levied per cigarette, although the medical costs incurred may of course vary across different types of smokers (and there is some evidence that smokers respond to higher taxes by simply smoking each cigarette more intensively, which offsets some of the effect of the tax).¹⁴ Externalities from passive smoking may be more difficult to target directly, however. These will likely vary according to the times and places at which people smoke and so will not be exactly targeted by tax that is levied on individual cigarettes. For example, these externalities may be larger for those who live with children than for those who do not, or larger in enclosed communal places. A combination of taxation and regulation such as the UK has adopted would seem to be the most

¹¹ Royal College of Physicians, 'Going smoke-free: the medical case for clean air in the home, at work and in public places', July 2005, <http://www.smokefreeengland.co.uk/files/going-smokefree.pdf>.

¹² S. Allender, R. Bakarishnan, P. Scarborough, P. Webster and M. Rayner, 'The burden of smoking-related ill health in the United Kingdom', *British Medical Journal*, 2009, 18, 262–7; C. Callum, S. Boyle and A. Sandford, 'Estimating the cost of smoking to the NHS in England and the impact of declining prevalence', *Health Economics, Policy and Law*, 2011, 6, 489–508.

¹³ W. G. Manning, E. B. Keeler, J. P. Newhouse, E. M. Sloss and J. Wasserman, 'The taxes of sin: do smokers and drinkers pay their way?', *Journal of the American Medical Association*, 1989, 261, 1604–9.

¹⁴ J. Adda and F. Cornaglia, 'Taxes, cigarette consumption and smoking intensity', *American Economic Review*, 2006, 96, 1013–28.

appropriate response to this issue. Policymakers should, however, remain wary of unintended consequences. Some research using data on individuals' time suggests that bans on smoking in public places led smokers to smoke more often at home, and that children's exposure to second-hand smoke may therefore have increased as a result, although other studies looking for the same phenomenon have not found evidence of this.¹⁵

Internalities of tobacco consumption

Smoking imposes large future costs on the smokers. These include reduced productivity, worse health and higher mortality. If smokers are completely rational, this would not provide an additional justification for taxing cigarettes: smokers would fully account for the future costs when deciding whether or how much to smoke. A good deal of evidence suggests, however, that many smokers suffer from self-control problems. For example, a high proportion of current smokers would like to give up – figures from the General Lifestyle Survey covering the period 2008–11 indicate that around 60% of current smokers in Great Britain would like to quit.¹⁶ This is a much higher share than the fraction that ends up successfully quitting in any given year. There is also evidence of actual support among some smokers for policies or programmes that restrict the general availability of tobacco.¹⁷

Whether taxation is the most appropriate policy response to self-control issues depends on how people respond to the tax. If individuals' consumption is relatively insensitive to the tax rate, then taxation will increase the cost of people's smoking habits without helping many of them to quit, thereby making smokers worse off. In this case, removing the stimuli that trigger the desire to smoke may be a more appropriate policy – for example, restricting the advertising of cigarettes. On the other hand, if smokers do reduce their demand in response to a price increase, then taxation could be an effective mechanism to help them cut down. The evidence that tobacco taxes increase the reported well-being of smokers *themselves* is mixed. Some studies have shown that the self-reported happiness of smokers actually increases relative to non-smokers when cigarette taxes increase.¹⁸ Other studies have indicated that smokers' happiness falls when prices increase but the happiness of smokers who have expressed a desire to quit increases in response to bans on smoking in public places.¹⁹ However, taxes do appear to be successful both in preventing individuals from taking up smoking in the first instance and

¹⁵ Adda and Cornaglia (2010) find that measures of smoke intake among non-smokers increase when bans are introduced, with particularly large effects for young children and those living with smokers. Looking at time-use data leads them to conclude that smokers respond to bans in public spaces by smoking more at home. Carpenter, Postolek and Warman (2011), however, find that reported exposure of non-smokers to second-hand smoke in the home does not increase when bans are introduced and that the overall exposure of non-smokers falls. (J. Adda and F. Cornaglia, 'The effect of taxes and bans on passive smoking', *American Economic Journal: Applied Economics*, 2010, 2, 1–32; C. Carpenter, S. Postolek and C. Warman, 'Public-place smoking laws and exposure to environmental tobacco smoke (ETS)', *American Economic Journal: Economic Policy*, 2011, 3(3), 35–61.)

¹⁶ Figure 5 in Office for National Statistics, 'Opinions and Lifestyle Survey: adult smoking habits in Great Britain, 2013', Statistical Bulletin, November 2014, http://www.ons.gov.uk/ons/dcp171778_386291.pdf.

¹⁷ J. Hersch, 'Smoking restrictions a self-control mechanism', *Journal of Risk and Uncertainty*, 2005, 31, 5–21; K. Kan, 'Cigarette smoking and self-control', *Journal of Health Economics*, 2007, 26, 61–81.

¹⁸ A. Leicester and P. Levell, 'Anti-smoking policies and smoker well-being: evidence from Britain', *Fiscal Studies*, forthcoming, DOI: 10.1111/j.1475-5890.2015.12063; J. Gruber and S. Mullainathan, 'Do cigarette taxes make smokers happier', *Advances in Economic Analysis and Policy*, 2005, 5, 1–5.

¹⁹ R. Odermatt and A. Stutzer, 'Smoking bans, cigarette prices and life satisfaction', Center for Research in Economics, Management and the Arts (CREMA), Working Paper no. 2015-16.

in reducing cigarette consumption among existing smokers.²⁰ This implies that taxes do help to address individuals' self-control problems, even if it is difficult to conclude whether existing tax rates are too high or too low relative to the costs smokers impose on their future selves.

Of course, variation across smokers in the degree to which they suffer from self-control problems introduces an additional distributional consideration to levying tobacco taxation. Taxes may benefit those with greater self-control problems by helping them quit but at the expense of imposing greater costs on those smokers who may not wish to give up. For more on the distributional impact of tobacco taxation, see Box 9.2 earlier.

Taxes on motoring

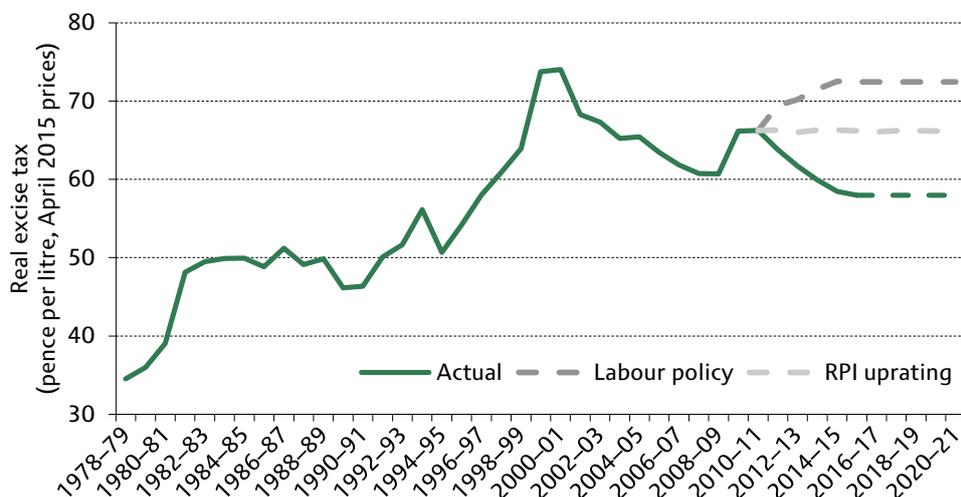
There are two main types of duty levied on motorists in the UK: fuel duties and vehicle excise duty.

Fuel duties

Unleaded petrol and diesel (which together account for the vast majority of road fuel in the UK) are subject to excise duties currently set at 57.95 pence per litre.

As with cigarette duties, VAT is charged on the duty-inclusive price of petrol. Like tobacco duty, fuel duties have also been subject to escalator policies that pencil-in above-inflation increases for future years. In an ideal world, such policies would be a good way of providing firms and consumers with certainty over future rates of duty. In practice, governments have not stuck to them, as Figure 9.7 shows. Indeed, the recent history of rates of fuel duties suggests that current rates of fuel duties are not the result of careful planning.

Figure 9.7. Real petrol duties, 1978–79 to 2020–21



Note: Petrol is leaded (4*) up to 1993, premium unleaded from 1994 to 2000 and ultra-low sulphur from 2001 onwards. Converted to April 2015 prices using the RPI. 'Labour policy' uprates duty by RPI plus 1p from April 2011 until April 2014 and RPI thereafter; 'RPI uprating' uprates duty by RPI. Dashed green line indicates announced future policy.

Source: Duty rates – HMRC website, <https://www.gov.uk/government/organisations/hm-revenue-customs>; HM Treasury, *Tax Benefit Reference Manual 2002–03 Edition*, 2002; various HMRC / HM Customs & Excise Annual Reports. RPI from National Statistics.

²⁰ See, for instance, F. Chaloupka and K. Warner, 'The economics of smoking', in A. J. Culyer and J. P. Newhouse (eds), *Handbook of Health Economics*, Volume 1B, North-Holland, 2000.

Table 9.2. Increases in rates of fuel duties: planned and enacted

(1) Date of planned uprating before Budget 2011	(2) Budget 2011	(3) Autumn Statement 2011	(4) June 2012	(5) Autumn Statement 2012	(6) Budget 2013	(7) Autumn Statement 2013	(8) Budget 2015 (March)
Apr 2011	<i>Jan 2012</i>	<i>Aug 2012</i>	<i>Jan 2013</i>	Cancelled	-	-	-
Apr 2012	<i>Aug 2012</i>	Cancelled	-	-	-	-	-
Apr 2013	Apr 2013	Apr 2013	Apr 2013	<i>Sep 2013</i>	Cancelled	-	-
Apr 2014	Apr 2014	Apr 2014	Apr 2014	<i>Sep 2014</i>	<i>Sep 2014</i>	Cancelled	-
Apr 2015	Apr 2015	Apr 2015	Apr 2015	<i>Sep 2015</i>	<i>Sep 2015</i>	<i>Sep 2015</i>	Cancelled
Apr 2016	Apr 2016	Apr 2016	Apr 2016	Apr 2016	Apr 2016	Apr 2016	Apr 2016

Note: Column (1) refers to the planned uprating in rates before the 2011 Budget; columns (2)–(8) show the fate of each planned rise at subsequent Budgets and Autumn Statements; e.g. the planned rise in April 2012 was cancelled in the 2011 Autumn Statement. Text in italics indicates a delay in the uprating.

Real duties increased dramatically in the early 1990s as escalators were introduced by the then Conservative government. These policies continued (and indeed accelerated) until they were abandoned under Labour in 1999 in the face of increases in the pre-tax cost of fuel and ahead of widespread fuel price protests the following year. There then followed a steady decline in the real duty rate, as planned increases in line with inflation were delayed and then cancelled. That pattern came to a short-lived pause in 2008 when duties were increased by the then Chancellor Alistair Darling and a new escalator was announced.

The coalition government initially stuck to the previous government's plans to increase duties but then, in George Osborne's second Budget, the remainder of the escalator was abandoned, duties were cut by 1p and a planned adjustment in line with inflation was delayed until August 2012. This marked the beginning of another prolonged period, reminiscent of the early 2000s, when inflation adjustments to rates of fuel duties would be announced, postponed and then cancelled. Table 9.2 shows the fate of inflation-based increases that were planned prior to the 2011 Budget.

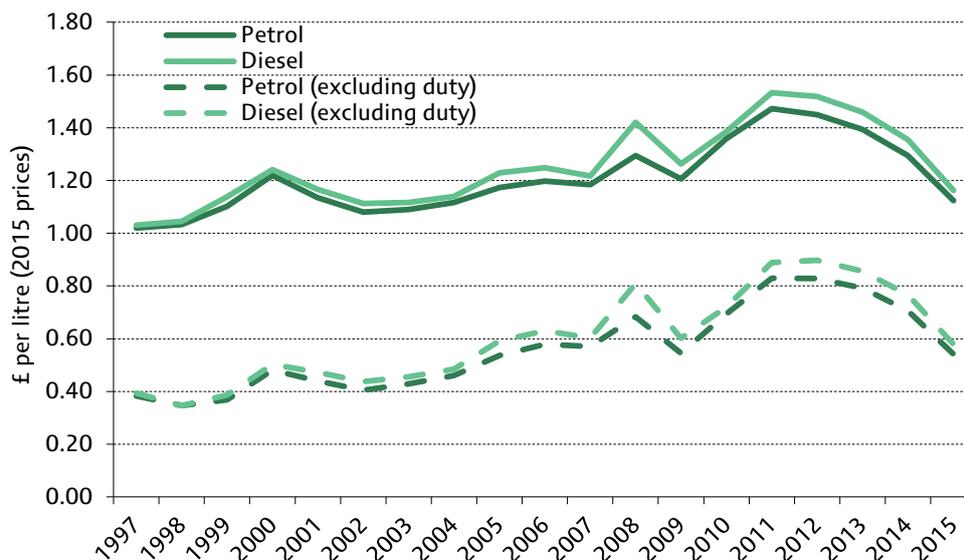
The coalition government's change in direction on fuel duties came at a substantial cost in terms of revenues. Revenues from fuel duties would have been around £6.3 billion higher in 2015 had the government stuck to the escalator planned by the previous Labour government and £4.0 billion higher if duty had been increased in line with inflation.²¹ By 2015, real fuel duties had fallen to roughly where they had been in at the end of the last Conservative government in April 1997.

In November 2015, duties made up 54% of the cost of a litre of petrol and 53% of the price of a litre of diesel.²² Nonetheless, the cost of a litre of fuel has tended to track movements in the pre-tax cost of petrol and diesel in recent years. Figure 9.8 shows movements in the pump prices of petrol and diesel since 1997. These increased steadily

²¹ Figures taken from S. Adam and B. Roantree, 'The coalition government's record on tax', IFS Briefing Note no. 167, March 2015, <http://www.ifs.org.uk/uploads/publications/bns/BN167170315.pdf> and updated by adding the estimated £140 million in lost revenue from the cancelling of a planned inflation increase in the March 2015 Budget.

²² Authors' calculations from Department of Energy and Climate Change figures, <https://www.gov.uk/government/statistical-data-sets/oil-and-petroleum-products-monthly-statistics>.

Figure 9.8. Real pump prices for petrol and diesel, 1997–2015



Note: Costs converted to 2015 prices using the RPI.
Source: Department of Energy and Climate Change.

before reaching peaks of £1.47 and £1.53 in 2011 for petrol and diesel respectively. In the last few years, they have fallen quite rapidly. The evolution of prices excluding duties shows a very similar pattern. Over the whole period, changes in fuel duties have only slightly reduced the size of fluctuations in pump prices. Under the previous coalition government, reductions in duty helped to dampen the effects of increases in the pre-tax price of fuel in the early years of the government. However, the additional declines in duties implemented since 2012 have served to accelerate falls in pump prices.

In the past, the Conservative Party considered adopting an explicit policy of adjusting duties so as to stabilise pump prices. Ahead of the 2010 election, it promised to introduce a ‘fair fuel stabiliser’ that would attempt to do just that. After the election, this policy took the form of a promise made in the 2011 Budget to reintroduce the 1p-above-inflation fuel duty escalator only if oil prices fell below \$75 a barrel in a ‘sustained way’. It is worth noting that oil prices did fall below this threshold towards the end of the coalition’s period in office, in late 2014, and have since remained there without fuel duties being increased. However, it is unclear whether this fall should count as ‘sustained’ or whether the pledge to reintroduce the escalator was still in effect at this time (the escalator was originally envisioned to last until April 2014). In any case, in practice, the coalition government tended to reduce fuel duties in periods of both rising and falling fuel prices; hence there is little evidence that fuel price stabilisation was really the key objective.

The cost of motoring does not depend only on the price of a litre of fuel. Over time, the amount of fuel required to travel a given distance has declined as technology has advanced and regulations have been tightened. Figures from the Department for Transport show that the average fuel efficiency for new petrol-powered vehicles increased from 8.3 litres per 100 kilometres in 1997 to 5.5 litres per 100 km in 2014. New diesel-powered vehicles likewise improved their fuel efficiency from an average of 7.0 litres per 100 km to 4.7 litres per 100 km over the same period.²³ Figure 9.9 shows

²³ Table TSGB0303 from <https://www.gov.uk/government/statistical-data-sets/tsgb03>.

Figure 9.9. Average real cost of driving 100 kilometres for new cars, 1997–2014



Note: Figures converted to 2015 prices using the RPI. Department for Transport figures on fuel efficiency are obtained using data from laboratory estimates of the fuel efficiency on new cars sold.

Source: Authors' calculations using petrol and diesel prices from the Department of Energy and Climate Change and km per litre from the Department for Transport.

how the implied costs of driving a kilometre changed in these years according to Department of Energy and Climate Change (DECC) estimates of petrol and diesel prices. While the real cost of fuel rose over this period, the average cost of motoring for those purchasing new vehicles fell from £8.50 per 100 km to £7.15 for the owners of petrol-powered cars and from £7.24 to £6.38 for the owners of diesel-powered cars. As well as the average efficiency of both petrol and diesel cars improving, there has also been a rapid shift in the composition of new car purchases towards those using more efficient fuels. From 2000 to 2012, the share of new cars using more-fuel-efficient diesel engines increased from 14.1% to 50.8%, while those using 'alternative' fuels (such as electricity) increased from close to 0% to 1.4%.²⁴

Improvements in fuel efficiency have implications for the future of fuel duties as a source of revenue. The Office for Budget Responsibility (OBR) expects fuel duty revenues to decline in importance in the coming years even as it expects total vehicle mileage to increase.²⁵ Fuel duty as a percentage of GDP is forecast to decline from 1.44% in 2015–16 to 1.26% in 2020–21. We discuss how the government could respond to these developments further in what follows.

Vehicle excise duties

Fuel duties are not the only taxes levied on motorists. Vehicle excise duty is an annual charge levied on the owners of vehicles. Currently, rates are banded according to cars' CO₂ emissions per kilometre, with the owners of cars in lower emissions bands paying less. In 2010, a special first-year rate (the so-called 'showroom tax') was introduced that is paid in the year a new car is registered. This rate is much more sensitive to vehicle emissions than the VED rate for subsequent years. It is currently zero for vehicles with

²⁴ Society of Motor Manufacturers and Traders, 'New car CO₂ report 2013', <http://www.smmmt.co.uk/wp-content/uploads/sites/2/SMMT-New-Car-CO2-Report-2013-web.pdf>.

²⁵ Office for Budget Responsibility, *Fiscal Sustainability Report*, July 2014, <http://budgetresponsibility.org.uk/fiscal-sustainability-report-july-2014/>.

emissions below 130 grams per kilometre but increases steeply for more polluting vehicles. Cars with emissions greater than 255g per km pay a charge of £1,100.²⁶

As with fuel duty, improvements in the efficiency of the car fleet over time have gradually eroded VED revenues. In his Summer Budget Speech, George Osborne claimed that by 2017, three-quarters of cars would pay no VED in their first year at all.²⁷ As a consequence, a reform to VED was announced that will take effect from 1 November 2017. All cars registered after April 2017 with non-zero emissions will pay a charge in their first year. As before, the charge increases with the level of emissions per kilometre. VED in subsequent years will, however, no longer depend on emissions (except that zero-emissions vehicles will be exempt) but will instead be charged at a flat rate of £140.²⁸ These changes are expected to raise an additional £1.4 billion by 2020–21.

How effectively are motoring externalities taxed?

Motoring is associated with a number of external costs that potentially justify excise taxation. Vehicle emissions contribute to general air pollution, and CO₂ emissions contribute to climate change. In addition, motorists may cause wear and tear on roads that they do not directly pay for. Finally, a decision to drive contributes to congestion that slows down the journeys of other drivers.

VED and fuel duties can both be thought of as addressing these externalities with varying degrees of success. Of the two, VED is the blunter instrument. This is because VED does not vary according to vehicle *use*, which essentially all motoring externalities depend on. While it discourages the purchase of more polluting vehicles for instance, it does not provide incentives for drivers to use their cars less. This might serve a purpose in increasing the salience of fuel efficiency as a consideration when vehicles are purchased, but is otherwise unlikely to achieve anything that could not be more effectively achieved with higher rates of fuel duties.

Fuel duties, on the other hand, are actually an effective tax for targeting the externalities associated with CO₂ emissions and climate change. This is because emissions are directly proportional to fuel use. However, carbon emissions alone cannot justify the current level of fuel duties. Burning a litre of petrol produces 2.4 kilograms of CO₂, while burning a litre of diesel produces slightly more, at 2.6 kg per litre.²⁹ With fuel duty on petrol and diesel at 57.95 pence a litre, this implies a CO₂ tax of £242.47 per tonne for petrol and £221.18 per tonne for diesel. These implied rates of tax per unit of emission are much higher than the values placed on carbon savings in UK government analyses (which are £29 per tonne in sectors covered by the EU Emissions Trading Scheme and £69 in non-traded sectors³⁰).

²⁶

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/419799/V149_Budget_2015_Final_version.pdf.

²⁷ <https://www.gov.uk/government/speeches/chancellor-george-osbornes-summer-budget-2015-speech>.

²⁸ In addition, cars worth £40,000 or more will pay a £310 supplement for the first five years.

²⁹ <http://www.publications.parliament.uk/pa/cm200203/cmselect/cmenvfru/929/3091706.htm>.

³⁰ Central estimates taken from Department of Energy and Climate Change, *Carbon Valuation in UK Policy Appraisal: A Revised Approach*, 2009, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/245334/1_20090715105804_e_carbonvaluationinukpolicyappraisal.pdf and converted to 2015 values using the Consumer Prices Index.

They are also much higher than the rates implied by carbon taxes that are applied to other forms of energy use.³¹

However, estimates of external costs associated with emissions tend to be greatly outweighed by other costs. The most widely cited evidence is Sansom et al. (2001), whose estimates suggest that congestion is by far the largest component of the external cost of motoring, accounting for 9.7–11.2p out of total externalities of 11.5–16.2p per kilometre driven.³² In recent years, the costs of congestion also appear to have been worsening. According to statistics from the Department for Transport, average vehicle speeds on English A-roads from 7am to 10am have declined from 25.3 miles per hour in 2011–12 to 24.3 miles per hour in 2013–14.³³

Fuel duties are better targeted at correcting for the external costs caused by congestion than VED, but they are imperfect. The amount of fuel used in a given journey is relatively insensitive to the degree of congestion, which varies from one part of the country to another and across different times of the day. Furthermore, more-fuel-efficient vehicles cause just as much congestion as other vehicles but pay less in fuel duty. Not only does this mean that fuel duties do not give the right incentives to drivers of more efficient vehicles, but it also means that unless duties increase as overall fuel efficiency improves, taxes paid per kilometre driven will fall even as road use (and so presumably congestion) increases in future.

The tendency of fuel duty payments to fall as vehicle efficiency improves, even as congestion has worsened, implies that changes in the private costs of motoring have not kept pace with changes in the social cost. (This would of course be desirable if fuel duties were previously set above their optimal rates, though in that case it still would not be desirable for the trend to continue indefinitely.) The fuel duty changes that would be required to reverse the declines in the cost of motoring for new vehicles would be substantial. Petrol and diesel duties would need to increase by 41% and 31% respectively to take the cost of driving a kilometre for new vehicles from its 2014 level to its 1997 level. HMRC estimates suggest this would raise £9 billion a year.³⁴ The smaller required increase in diesel duties is due to less improvement in the efficiency for cars with diesel-powered engines than for those with petrol-powered engines. However, since diesel-powered cars currently pay less fuel duty per kilometre on average, there may be reason to increase diesel duties more than petrol duties.

A far more promising approach to addressing congestion externalities now and in the future would, however, be a system of road pricing that charges drivers according to when and where they drive. Unlike the current system of duties, this would incentivise motorists to drive at less congested times and to travel on less congested routes. Such a system could replace much of the revenues currently received from fuel duties and VED.

³¹ See, for example, figure 6.5 in A. Advani, S. Bassi, A. Bowen, S. Fankhauser, P. Johnson, A. Leicester and G. Stoye, *Energy Use Policies and Carbon Pricing in the UK*, IFS Report R84, November 2013, <http://www.ifs.org.uk/publications/6915>.

³² T. Sansom, C. Nash, P. Mackie, J. Shires and P. Watkiss, 'Surface transport costs and charges: Great Britain 1998', Department of the Environment, Transport and Regions, 2001, http://www.its.leeds.ac.uk/fileadmin/user_upload/Surface_Transport_Costs_and_Charges_Great_Britain_2001.pdf. We do not include the costs of operating public service vehicles, taxes due but not paid by motorists or the 'Mohring effect' in the total cost of road use in our figures for total cost as we only aim to capture the social costs of private motoring.

³³ Table CGN0201a at <https://www.gov.uk/government/statistical-data-sets/cgn02-flow-weighted-vehicle-speeds>.

³⁴ <https://www.gov.uk/government/statistics/direct-effects-of-illustrative-tax-changes>.

These taxes could, however, remain – at lower rates – to ensure that vehicle emissions are correctly priced. The introduction of road pricing would have the additional advantage of making future revenues less sensitive to continued improvements in vehicles’ fuel efficiency. This would be a much more rational response to falling revenues than raising rates of fuel duty and VED as cars’ fuel use and emissions decline. Further increases in existing taxes in the face of these developments will simply lead to a situation where those travelling on uncongested routes are greatly overtaxed relative to the costs they impose on others.

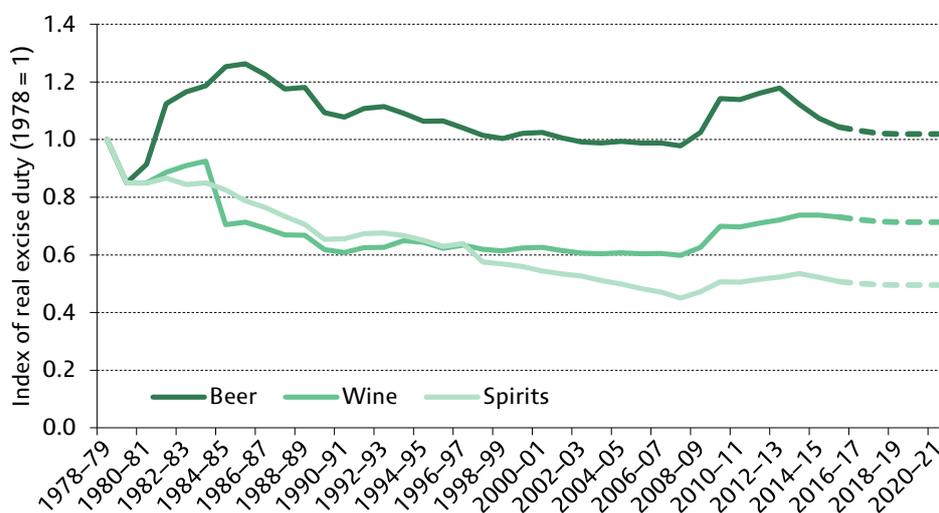
Road pricing schemes already exist in a number of countries and in some cases are automatically adjusted quite sensitively according to road conditions. The arguments for such an instrument are examined in detail in a previous IFS report.³⁵

Alcohol duties

In the UK, alcohol taxes are differentiated across different alcohol types. As with tobacco and fuel, VAT is charged on the duty-inclusive price. Figure 9.10 shows how real alcohol duty rates for beer, wine and spirits have evolved from 1978–79 to present and how they are expected to evolve to 2020–21 under currently-announced policy. Beer duty peaked in 1985–86 (around 25% higher than in 1978–79) before falling back to a level that today, in real terms, is around 4% higher than in 1978–79. For wine and spirits, the broad trend has been a decline in real duties. Real wine duty is now just 73% of its 1978–79 level and for spirits the duty level is now only 51% of the 1978–79 level.

Data collected by the World Health Organisation suggest that average per-capita consumption of pure alcohol for people aged 15 and over in the UK grew from 10.9 litres

Figure 9.10. Real alcohol duties, 1978–79 to 2020–21

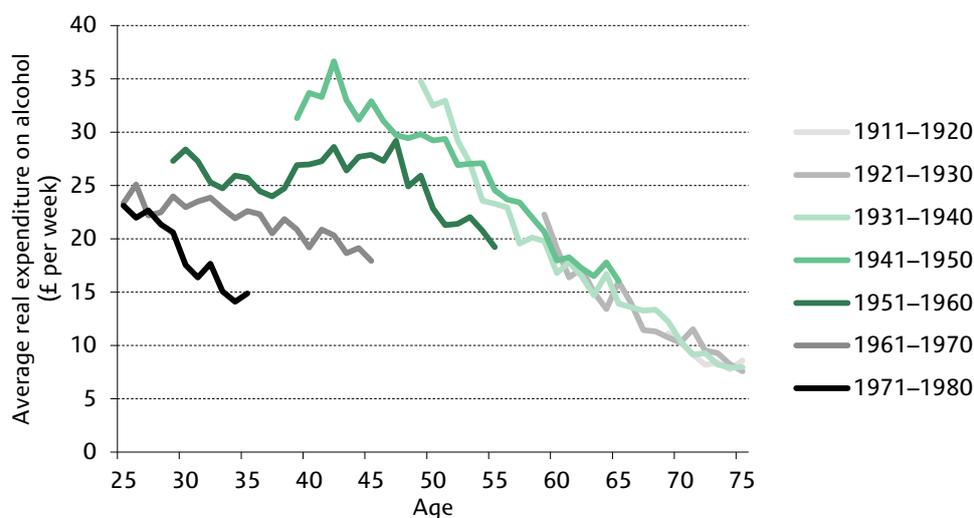


Note: Assumes beer at 3.9% ABV, wine not exceeding 15% ABV and spirits at 40% ABV. Rates are indexed relative to levels in 1978–79. Dashed lines indicate announced future policy.

Source: HMRC website, <https://www.gov.uk/government/organisations/hm-revenue-customs>; HM Treasury, *Tax Benefit Reference Manual 2002–03 Edition*, 2002; various HMRC / HM Customs & Excise Annual Reports.

³⁵ P. Johnson, A. Leicester and G. Stoye, *Fuel for Thought: The What, Why and How of Motoring Taxation*, May 2012, RAC Foundation, London, <http://www.ifs.org.uk/publications/6175>.

Figure 9.11. Real expenditure on alcohol by age and birth cohort, 1978–2013



Note: Each line represents average real household expenditure on alcohol at each age for household heads born in one of seven 10-year intervals from 1911 to 1971 over the periods they are observed from 1978 to 2013. Real expenditures calculated by dividing household nominal expenditure on alcohol by the alcohol price component of the RPI (in 2014 prices).

Source: Authors' calculations from Living Costs and Food Survey (various years).

in 1978 to 11.7 litres in 2004, before falling back to 9.7 litres in 2012.³⁶ This recent reduction in alcohol consumption may reflect a fall in consumption among younger consumers. Figure 9.11 plots spending on alcohol by different birth cohorts (in this case, household heads born within the same decade) at the different ages they are observed over the period 1978–2013. Spending is measured by dividing cash expenditures by an index for the price of alcohol taken from the RPI. While the fall in the age profile of spending across cohorts is not quite as striking as for tobacco, there is nevertheless evidence that, at each age, consumers born between 1971 and 1980 on average spent less on alcohol than those born between 1961 and 1970, who in turn at each age spent less than those born between 1951 and 1960. This pattern continues until the 1941–1950 cohort, who have an age-spending profile similar to those of earlier cohorts. Like cigarettes, spending on alcohol tends to fall as individuals get older. Of course, while the fall in alcohol spending across younger cohorts may reflect a fall in alcohol consumption, it may also reflect a change in spending patterns – for instance, any increased tendency among younger cohorts to consume off- rather than on-trade.³⁷

Externalities and internalities of alcohol consumption

Externalities associated with alcohol consumption include (i) direct externalities experienced by victims of accidents, property damage and violence caused by other people's drinking, (ii) collectively-borne costs such as policing and publicly-funded medical costs associated with alcohol abuse and (iii) tax revenue externalities. Alcohol consumption, for some individuals, is also likely to lead to internalities such as future health problems.

³⁶ World Health Organisation Global Health Observatory data, <http://apps.who.int/gho/data/node.main.A1022?lang=en>.

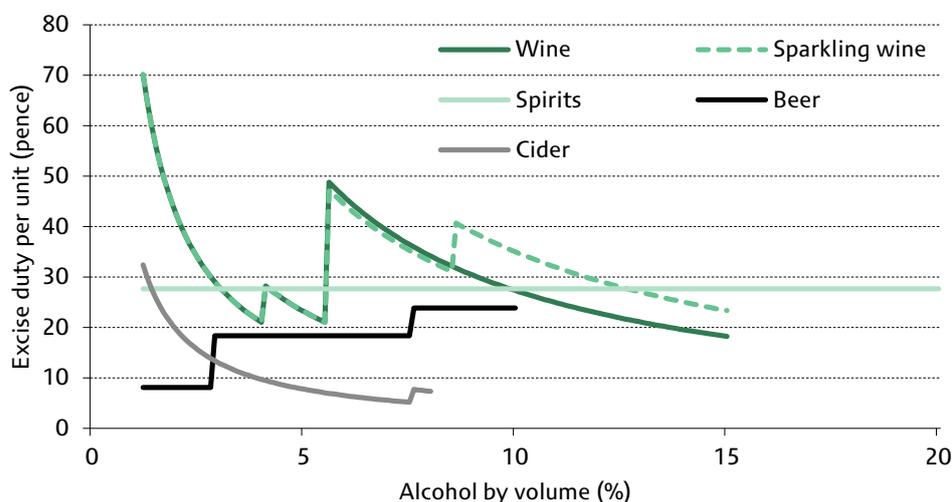
³⁷ This pattern may also in part be explained by known declines in the amount of total household spending captured by the Living Costs and Food Survey.

In contrast to tobacco, where the social harm from externalities is probably approximately linear in the level of consumption, both externalities and internalities from alcohol are likely to be highly non-linear: while for a smoker the next cigarette of the day is roughly as damaging as the first, the tenth pint of beer in an evening is likely to cause much more harm than the first. In addition, for a given level of consumption, the size of harm is likely to vary across people: the tenth pint of beer for someone prone to alcohol-fuelled violence is likely to be more harmful than the tenth pint consumed by the convivial drunk. This creates challenges both in quantifying the marginal external (or internal) costs of alcohol consumption, and hence the appropriate tax level, and in designing a tax structure that effectively targets the most harm-inducing consumption.

Notwithstanding these difficulties, a reasonable starting point in the design of alcohol excise taxes may be that, all else equal, taxes per unit of alcohol should be the same regardless of the form of drink. This would make sense if the harm associated with the consumption of an additional unit of alcohol by an abusive consumer is not dependent on the type of alcohol he or she drinks.³⁸ On the other hand, if abusive drinkers tend to consume more of their alcohol units in concentrated form (as, for instance, this allows for more rapid alcohol consumption) or alcohol with any other identifiable characteristic, then there is a case for taxing this form of alcohol more strongly.

Figure 9.12 shows the current structure of alcohol excise taxes, measured per unit of alcohol. Excise taxes vary by alcohol type and strength. Strength is measured as alcohol by volume (ABV) – the percentage of an alcohol product’s volume comprised of pure alcohol. For beer, lager, spirits and spirit-based alcopops, the tax is levied directly on alcohol content. For cider and wine, the tax is levied per litre of product (within broad strength bands). To make the figure easier to read, we stop the horizontal axis at 20% ABV; however, it should be noted that the 27.66 pence per unit duty for spirits also applies to spirits products stronger than 20% ABV.

Figure 9.12. Excise tax per unit of alcohol, by alcohol strength and type



Note: Figure assumes all cider is ‘still’ (‘sparkling’ cider attracts a different duty rate, which is levied only on champagne substitutes in pressurised bottles).

Source: Calculated from HMRC data.

³⁸ A unit of alcohol is equal to 10 millilitres (8 grams) of pure alcohol. In the UK, a standard measure of strong spirits (e.g. vodka) contains 1 unit of alcohol.

For spirits and spirit-based alcopops, the tax levied per unit of alcohol is constant in strength. For beer, the tax per unit of alcohol increases with strength; strong beers attract a higher tax rate than mid-strength beers, which in turn attract a higher tax rate than low-strength beers. For wines and cider, the tax per unit varies by type and declines in strength, with discrete jumps at several points. For instance, a cider with 6% ABV attracts half the excise tax per unit of alcohol of a cider with 3% ABV. The highest rates of all are levied on very low-strength wine ‘coolers’, at more than 50p per unit, in contrast to a typical table wine of 12.5% ABV which has a duty rate of 21.9p per unit. The banding creates particular oddities for wine: moving from a wine of 5.5% ABV to 5.6% ABV sees the duty rate per unit jump from 21.1p to 48.8p. Cider typically attracts a much lower rate of duty per unit than other alcohol types, and high-strength ciders have by far the lowest duty rates per unit of any alcohol product. A cider of 7.5% ABV attracts a duty of 5.2p per unit, whereas a beer of the same strength attracts a duty of 18.4p. As a result, a litre of 7.5% ABV beer will be liable for duty of 138p, while a litre of 7.5% ABV cider will attract duty of only 39p.

Overall, it is very difficult to justify the existing structure of alcohol excise taxes based on the likely harm associated with consuming different types and strengths of alcoholic drinks. The structure of alcohol excise taxes is partly restricted by an EU Directive that sets out that the tax base for wine and cider should be the volume of liquid, whereas the base for spirits and beer is the alcohol content.³⁹ This places legal constraints (the existence of which is hard to defend on any economic grounds) on what reforms the government could legally undertake. Nevertheless, within these constraints, the system could better target problem drinking.

A minimum unit price for alcohol?

A minimum unit price for alcohol has been proposed as an alternative price-based policy aimed at targeting problem alcohol consumption. The policy involves imposing a price floor for alcohol below which it would be illegal to sell. In 2012, the Home Office consulted on the introduction of a 45p minimum unit price for alcohol in England and Wales. Previous IFS research has shown that around 55% of alcohol units purchased off-trade (in off-licences and supermarkets for home consumption) were priced below the proposed 45p minimum unit price, ranging from 84% of cider units to fewer than 1% of alcopop units.⁴⁰ Therefore the introduction of this policy would have had a considerable impact on the price of a large range of alcohol products. However, the UK government subsequently shelved plans for a minimum unit price in England and Wales and instead, on 28 May 2014, introduced a ban on selling alcohol products at prices below the amount of duty plus VAT levied on them.⁴¹ This alternative price floor is much lower than the proposed minimum unit price, with only around 1% of alcohol sales prior to the ban being below the floor.⁴²

³⁹ European Commission Council Directive 92/83/EEC, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992L0083:en:HTML>.

⁴⁰ R. Griffith, A. Leicester and M. O’Connell, ‘Price-based measures to reduce alcohol consumption’, IFS Briefing Note BN138, March 2013, <http://www.ifs.org.uk/publications/6644>.

⁴¹ For details, see Home Office, ‘Guidance on banning the sale of alcohol below the cost of duty plus VAT’, March 2015, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/415522/HO_Guidance_on_BBCS.pdf.

⁴² R. Griffith, A. Leicester and M. O’Connell, ‘Price-based measures to reduce alcohol consumption’, IFS Briefing Note BN138, March 2013, <http://www.ifs.org.uk/publications/6644>.

In 2012, the Scottish government legislated for a 50p minimum unit price.⁴³ However, the European Court of Justice has questioned the legality of the Scottish legislation, ruling that its effect would be ‘to restrict the market, and this might be avoided by the introduction of a tax measure designed to increase the price of alcohol instead of a measure imposing a minimum price per unit of alcohol’. Whether the policy is implemented depends on whether the Scottish government can demonstrate that it is not possible for health to be protected equally effectively by alternative tax measures.⁴⁴

Table 9.3 uses data on off-trade alcohol purchases made by a representative sample of British households over the calendar year 2011.⁴⁵ It categorises households into groups based on the number of units of alcohol per adult per week they record purchasing throughout the year, and it describes the average price per unit the households paid, the average alcohol strength of their purchases and the share of their alcohol units comprised of spirits. The table shows that households that consistently purchase relatively large amounts of alcohol do indeed tend to buy products that are cheaper in per-unit terms. Therefore a minimum unit price would, to some extent, target heavy drinkers more than more moderate drinkers. However, households that consistently purchase relatively large amounts of alcohol also tend to purchase stronger products and purchase more of their alcohol in the form of spirits. This suggests that tax reform that increases taxes on high-strength products, or on spirits, would also target heavy drinkers (while also raising questions about the sense behind the historic decline in spirits duties). An increase in the rate of tax levied on spirits could be implemented without falling foul of EU law.

Previous IFS research has demonstrated that if all consumers reduce their alcohol demand in response to price increases by the same amount, it would be possible to target heavy drinkers more effectively by reforming taxes (so that they increase in alcohol strength) than by introducing a minimum unit price.⁴⁶ The same work also showed that a minimum unit price, which will have the effect of dampening price competition, is likely

Table 9.3. Variation in alcohol purchases by long-run purchase level

Average purchase of units of alcohol per adult per week	Price per unit of alcohol (p)	Alcohol by volume (%)	Share of alcohol units from spirits (%)
Less than 7 units	51.0	10.1	27.1
7–14 units	46.0	11.2	27.0
14–21 units	44.3	12.1	29.6
21–35 units	42.6	12.6	32.1
More than 35 units	40.2	14.1	39.6
All households	48.6	10.8	31.1

Note: Numbers are based on the off-trade purchases made by a representative sample of British households in 2011.

Source: Authors’ calculations using the Kantar Worldpanel.

⁴³ Details of the legislation can be found at <http://www.legislation.gov.uk/asp/2012/4/contents/enacted>.

⁴⁴ See BBC News website, ‘Minimum alcohol pricing plan “may breach EU law”’, 23 December 2015, <http://www.bbc.co.uk/news/uk-scotland-35160396>.

⁴⁵ Off-trade purchases refer to alcohol products that households purchase and bring into the home. Such purchases made up three in four alcohol units purchased in 2010 – see R. Griffith, A. Leicester and M. O’Connell, ‘Price-based measures to reduce alcohol consumption’, IFS Briefing Note BN138, 2013, <http://www.ifs.org.uk/publications/6644>.

⁴⁶ See R. Griffith, A. Leicester and M. O’Connell, ‘Price-based measures to reduce alcohol consumption’, IFS Briefing Note BN138, 2013, <http://www.ifs.org.uk/publications/6644>.

to lead to windfall profits for the alcohol or retail industry and lower tax revenue (it estimated a 3% reduction in alcohol tax revenue following the introduction of a 45p minimum unit price). However, whether tax reform could be better targeted than a minimum unit price in reality depends crucially on how consumer price responsiveness for alcohol varies both across consumers with different levels of consumption and across

Box 9.3. Cross-border and illegal shopping

One way in which some consumers are likely to respond to higher prices resulting from excise taxes is by switching to purchasing goods abroad (where the price may be lower) or in an illicit segment of the market (in which tax is not levied). The higher are duties the larger is the incentive for consumers to switch to consumption that entails tax avoidance (cross-border shopping) or evasion (illicit purchases). Such switching, at least from a domestic point of view, is undesirable as it results in the same loss in tax revenue as if the consumer ceased consumption altogether, but without the reduction in social harm.

Measuring the extent of tax avoidance and evasion is difficult. HM Revenue & Customs does, however, provide estimates of the extent of both, although these numbers should be treated as having a high degree of statistical uncertainty. Table 9.4 summarises these estimates for alcohol and tobacco. In particular, we report the illicit share of the market and the tax gap, which, respectively, measure the share of the market made of illicit (non-taxed) purchases and the associated loss in tax revenue. We also report the share of domestic revenue estimated to be lost to cross-border shopping. Overall, illicit and cross-border shopping is estimated to have resulted in a £1.5 billion loss in tax revenue from alcohol (14% of total alcohol tax revenue) in 2013–14 and a £2.6 billion loss in tax revenue from tobacco (27% of total tobacco tax revenue). The illicit sector is particularly large for hand-rolled tobacco, in part because hand-rolled tobacco is commonly used in the (illegal) consumption of marijuana. In contrast, estimates of the tax gap for diesel and petrol are very small, although HMRC does estimate £0.5 billion is lost to cross-border shopping for diesel.

Table 9.4. Lost revenue from evasion and cross-border shopping, 2013–14

	Illicit market share (%)	Tax gap (£m)	Tax loss from cross-border shopping (£m)
Beer	13	750	10
Spirits	5	250	80
Wine	3	200	160
Cigarettes	10	1,100	400
Hand-rolled tobacco	39	1,000	100

Note: Tax gap and tax loss from cross-border shopping include both lost duty and VAT revenue.

Source: HM Revenue & Customs, *Measuring Tax Gaps 2015 Edition*, October 2015, <https://www.gov.uk/government/collections/measuring-tax-gaps>.

The scale of tax avoidance in the alcohol and tobacco markets appears to be a matter of some concern for the government. In the Summer 2015 Budget, the Chancellor announced a whole raft of measures to try to address the trade in illicit tobacco and alcohol. These measures are expected to raise £450 million by 2020–21, which would represent around 2% of total alcohol and tobacco revenues in that year.^a

^a HM Treasury, *Summer Budget 2015*, July 2015, <https://www.gov.uk/government/publications/summer-budget-2015>.

different types of alcohol. IFS research to be published in Spring 2016 is exploring precisely this question.

Future policy

While much of the recent debate over how best to tackle alcohol-related harm has focused on minimum unit pricing, we recommend that serious consideration should be given to reform of alcohol taxes. Even within the constraints placed by EU law, the alcohol tax system should be reformed to better target alcohol consumed disproportionately by heavy drinkers. For instance, ceasing (and potentially reversing) the decline in spirits duties relative to duties on other alcoholic drinks and reforming cider duties so that they are no longer extremely low for strong products would be a good start.⁴⁷ Sensible tax reform may well do a more effective job at targeting harmful alcohol consumption than minimum unit pricing. It would also avoid providing a windfall boost to those making or selling alcohol and the legal wrangles associated with a minimum unit price.

Nevertheless, the impact of any policy reform is uncertain and will depend on how consumers and firms change their behaviour in response. For instance, will firms change prices one-for-one with tax changes; will they keep the prices of the products not directly affected by a minimum unit price unchanged? Will consumers respond to higher prices by switching to alcohol purchased illegally or abroad (see Box 9.3)? Ultimately, the response of consumers and firms to policy change will determine the effectiveness of any change. It is crucial to factor existing evidence into policymaking and to expand the evidence base.

9.4 A tax on sugar?

Excise duties are not currently levied on any food or non-alcoholic drinks in the UK.⁴⁸ The House of Commons Health Committee has recently published proposals that include calling for a tax on sugar-sweetened soft drinks.⁴⁹ Public Health England has suggested introducing a tax to achieve a minimum price increase of 10–20% on high-sugar products such as sugar-sweetened soft drinks.⁵⁰ In this section, we discuss the rationale for such a tax and factors that should be taken into account when considering its introduction. We will draw on some preliminary findings from ongoing research due to be published in Spring 2016.

Externalities and internalities of sugar consumption

There is growing concern about the dangers of excessive sugar consumption. Consuming excess sugar is associated with weight gain, which increases the risk of heart disease,

⁴⁷ In the March 2015 Budget, the Chancellor instead cut spirits duty and cider duty by 2%, claiming the latter cut was ‘to support our producers in the West Country and elsewhere’. He failed to make the case for why British producers need specific government assistance and, if such a case does exist, it is highly unlikely that cuts in cider duties are the most appropriate response. See <https://www.gov.uk/government/speeches/chancellor-george-osbornes-budget-2015-speech>.

⁴⁸ Unlike tobacco, fuel and alcohol, VAT is not applied to all food products. VAT is applied to food supplied in the course of catering, but is not applied to most food not supplied in the course of catering. Exceptions to the latter include ice cream (but not frozen yoghurt) and confectionery (but not cakes or some biscuits). The differential application of VAT to food is a policy mess and certainly cannot be justified on the basis of encouraging better diet.

⁴⁹ Page 13 of House of Commons Health Committee, *Childhood Obesity: Brave and Bold Action*, November 2015, <http://www.publications.parliament.uk/pa/cm201516/cmselect/cmhealth/465/465.pdf>.

⁵⁰ Page 8 of Public Health England, *Sugar Reduction: The Evidence for Action*, October 2015, <https://www.gov.uk/government/publications/sugar-reduction-from-evidence-into-action>.

type 2 diabetes, strokes and other health conditions.⁵¹ The existence of these health costs potentially justifies government intervention to reduce sugar consumption. First, there are likely to be externalities associated both with the publicly-funded medical costs and through lost tax revenue and increased benefit payments due to diet-related illness (and, more specifically, excessive sugar consumption). Second, internalities might arise due to a lack of awareness of the sugar contents of products or the dangers of high sugar consumption or due to the existence of self-control problems that may lead individuals to consume in ways that they subsequently regret.

Official government advice recommends that less than 5% of total calorie intake should come from 'added sugar'.^{52,53} However, most people purchase much more than this recommendation: more than 90% of households buy in excess of 5% of their calories as added sugar, and 35% of households buy in excess of 15% of their calories as added sugar.⁵⁴ On average, households buy 13% of their calories in the form of added sugar. This figure has remained broadly stable over the last 15 years.

As with alcohol, the externalities and internalities of sugar consumption are not likely to be linear in the amount of sugar consumed, nor are they likely to be the same across people. While consuming a small amount of sugar is unlikely to have harmful health effects, the health effects of an additional portion of sugar for someone suffering from diabetes could be severe. Ideally, any policy would target the sugar consumption of those already, or liable to become, obese, overweight or suffering from diet-related illness, and leave the behaviour of healthy-weight individuals unaffected.

A sugar tax

The motivation for introducing a tax on sugar is simple: by increasing the relative prices of sugary products, it will induce consumers to switch to buying lower-sugar alternatives. This in turn would lower the incidence of obesity- and diet-related disease. In practice, there are a number of complicating factors that may limit a sugar tax's effectiveness at reducing the harms of sugar consumption.

Purchases of sugar are concentrated in a relatively small number of food groups: almost 40% of added sugar purchases are from chocolate, confectionery and sugary drinks,⁵⁵ as shown by Figure 9.13. However, although sugary drinks contribute a significant proportion of people's total added sugar, their contribution is still less than 20%.

Even if a sugar tax imposed on soft drinks achieved the very unlikely goal of leading everyone to switch entirely to low-sugar alternatives (reducing the sugar obtained from sugary drinks to zero), more than 88% of people would still be purchasing more than the recommended 5% level.⁵⁶ This is a best-case scenario in the sense that it assumes the

⁵¹ Page 9 of Public Health England, *Sugar Reduction: The Evidence for Action*, October 2015, <https://www.gov.uk/government/publications/sugar-reduction-from-evidence-into-action>.

⁵² Scientific Advisory Committee on Nutrition, *Carbohydrates and Health*, June 2015, <https://www.gov.uk/government/publications/sacn-carbohydrates-and-health-report>.

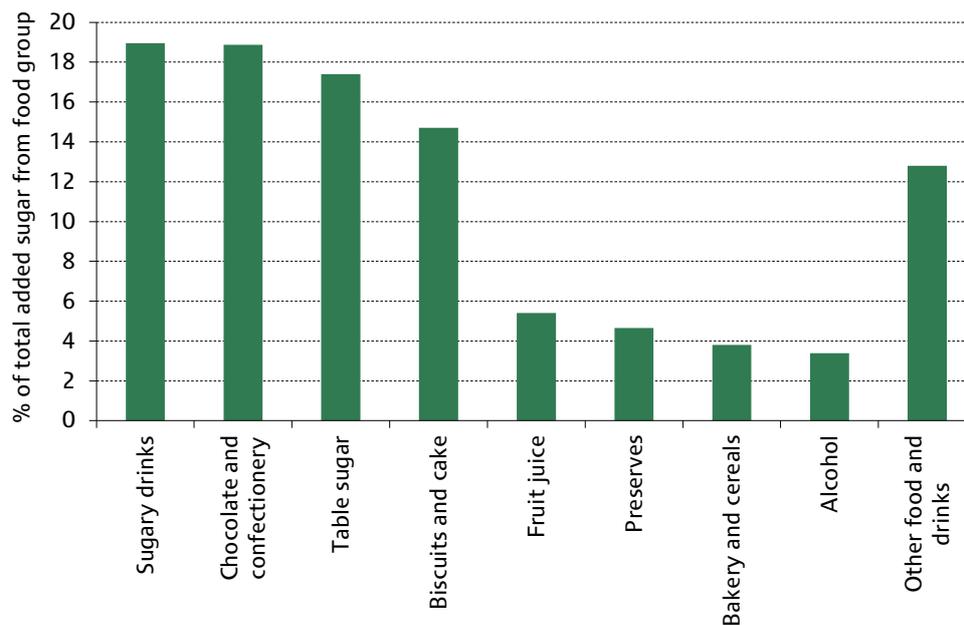
⁵³ Added sugar includes all sugars added to foods plus those naturally present in fruit juices, syrups and honey. It does not include the sugars naturally present in intact fruit and vegetables or milk and dairy products.

⁵⁴ Authors' calculations using the Living Costs and Food Survey 2011. Includes food brought into the home, takeaways and food eaten out in restaurants and pubs.

⁵⁵ Sugary drinks include non-diet soft drinks, concentrated squash and other drinks containing sugar (e.g. milkshake mixes), but exclude fruit juice.

⁵⁶ Authors' calculations using the Living Costs and Food Survey 2011. Includes food brought into the home, takeaways and food eaten out in restaurants and pubs.

Figure 9.13. Sources of added sugar



Note: Added sugar includes all sugars added to foods plus those naturally present in fruit juices, syrups and honey. It does not include the sugars naturally present in intact fruit and vegetables or milk and dairy products. Sugary drinks include non-diet soft drinks, concentrated squash and other drinks containing sugar (e.g. milkshake mixes), but exclude fruit juice.

Source: Authors' calculations using Living Costs and Food Survey 2011.

maximum possible reduction in sugar and ignores any substitution towards other sources of sugar, such as fruit juice, chocolate, sweets or alcohol. In practice, if a tax were imposed on sugary soft drinks, it is likely that there would be some degree of substitution to other products that contain sugar. It is clear, therefore, that a tax levied only on sugary soft drinks could not of itself achieve anything like the reduction necessary to bring sugar consumption below the recommended levels.

Nevertheless, a tax on sugar-sweetened soft drinks may represent a reasonable first step towards lower dietary sugar. Unlike other products that contain sugar, sugar-sweetened soft drinks do not contain any other nutrients and therefore consumer substitution away from these products would not directly lead to a reduction in the consumption of other, potentially nutritious, nutrients. A tax on sugar-sweetened soft drinks, by increasing their relative price, would induce some consumer switching away from these products, and could potentially have an additional effect of deterring consumption by signalling the associated potential health consequences.

However, the impacts of such a measure would depend crucially on what, if any, other foods or drinks consumers switch to in response, and how this pattern of substitution varies with consumers' total sugar consumption. If, for instance, some consumers have very strong preferences for sugar and therefore switch from taxed sugary soft drinks to chocolate, a tax on sugar-sweetened soft drinks may have a limited impact on their sugar consumption while also increasing their consumption of saturated fat (another nutrient that is typically consumed in excess of government guidelines and for which there is evidence linking it to diet-related disease). Some consumers are also likely to respond to the tax by switching to diet soft drinks (which contain sweeteners instead of sugar). While this form of switching may be welcomed, as it leads to less dietary sugar, evidence

on the health effects of consumption of low-calorie sweeteners is both mixed and limited.⁵⁷

If the government's aim is to reduce added sugar towards the recommended intake level for the majority of the population, it may consider the broader measure of introducing a tax that applies to a wider range of products (for example, all food and drink) and that is levied in proportion to products' sugar contents. This is likely to be more challenging to implement than a sugary soft drinks tax, but given that most food and beverages are covered by mandatory labelling that requires that sugar contents are displayed on packaging, the implementation costs may not be prohibitive.

However, it is also important to understand that a 'sugar tax' levied on all food and drink products is likely to have a considerable effect on consumption of nutrients other than sugar. For example, most food products contain many nutrients: a food product low in sugar may be high in salt or fat. A tax on sugar may decrease the relative price of some salty or fatty foods and thus induce people to substitute towards these. This could lead to an ambiguous effect on overall diet quality, which depends on many things besides the proportion of ingested calories that come from added sugar.

The response of retailers and food manufacturers

An important determinant of the effect of any tax on consumption is the extent to which it is passed on to retail prices. In a perfectly competitive market, firms set prices equal to the cost of producing the product; the introduction of any tax will therefore be entirely passed through to consumer prices. However, the UK food market is characterised by large manufacturers and supermarkets that are likely to have some power to set prices above the cost of production. This means that they may choose to increase prices by less (or more) than any tax levied. They may also choose to change the prices of products that are not affected by the tax. For example, if a price increase for cola results in some consumers switching to diet cola, it is possible that the manufacturers and/or retailers will respond to tax levied on cola by also raising the price of diet cola, dampening the extent of any consumer switching to this product.

Manufacturers may also respond to a tax levied on sugar by reformulating their products. If they try to avoid the tax by reducing the amount of sugar in their products, this could contribute to the success of the policy in reducing sugar consumption. However, the overall impact will also depend on whether manufacturers alter other ingredients too. For example, if manufacturers respond by replacing the sugar in products with more salt or fat, this could dampen the positive impact of the policy on overall diet quality.

Future policy

There is evidence of considerable external costs associated with obesity- and diet-related disease – for instance, the NHS bill for treating obesity is £5 billion per year and the bill for treating diabetes is £10 billion per year.^{58,59} In addition, it is likely that poor diet leads to large internalities – it is unlikely, for instance, that the 10% of 4- to 5-year-olds or the

⁵⁷ See BBC News Website (2016) 'Diet debate: Are diet drinks a no-go?' <http://www.bbc.co.uk/news/health-34924036>.

⁵⁸ Page 5 of Public Health England, *Sugar Reduction: The Evidence for Action*, October 2015, <https://www.gov.uk/government/publications/sugar-reduction-from-evidence-into-action>.

⁵⁹ Page 5 of Diabetes UK, *The Cost of Diabetes Report*, January 2014, <https://www.diabetes.org.uk/Documents/Diabetes%20UK%20Cost%20of%20Diabetes%20Report.pdf>.

19% of 10- to 11-year-olds in England who are obese (or their parents) have all fully taken account of the severe future consequences of their current obesity.⁶⁰ As excessive sugar consumption is a leading contributor to obesity- and diet-related disease, there is a clear case for considering measures (including taxation) that seek to limit the consumption of sugar.

However, to varying degrees, tackling the externalities and internalities associated with diet is more complex than tackling those associated with tobacco, motoring and alcohol. Diet is multifaceted, which makes designing policy to improve nutrition difficult: achieving a reduction in the consumption of a particular nutrient may also lead to a reduction in another broadly healthy nutrient or an increase in a broadly unhealthy nutrient.

One policy that may sidestep some of these challenges, at the cost of having a more limited impact on sugar intake, is to introduce a tax levied specifically on sugar-sweetened soft drinks (which contain no other nutrients). As the vast majority of people consume more sugar than is recommended, this may represent a reasonable first step towards reducing sugar consumption. However, even here the efficacy of the policy is not immediately clear; it will depend on what consumers switch to and on how firms change their prices in response to the tax. In addition, even if the tax is successful in eliminating all sugar consumption from soft drinks, most people will still be left consuming more than the recommended maximum amount of sugar.

A more broad-based sugar tax, applied to added sugar in all food and drinks, may offer the potential of lowering sugar consumption towards recommended levels. However, such a policy risks having unintended consequences for other dimensions of diet, which may offset the benefit of lower dietary sugar. Any such policy should be very carefully designed, based on the best evidence and adjusted as more evidence becomes available. It should also be considered alongside alternative or complementary policies such as regulation and voluntary agreements with industry.⁶¹

9.5 Conclusion

The main economic justification for the use of excise taxes is to correct socially costly behaviour that is not taken into account by individuals when deciding what and how much to consume. These costs may be borne by others or society at large, or by the consumer in the future. There is considerable evidence that consumption of tobacco, fuel and alcohol generates such costs, although the extent of these costs can vary in complex ways with the amount consumed and can vary across individuals. The existence of such social costs provides a rationale for levying excise duties on these goods. However, it is important that any tax is well designed to target externalities or internalities associated with consumption.

There is a clear case for reform to the way that motoring and alcohol are taxed. Fuel and vehicle excise duties do not target the primary externality – congestion – associated with

⁶⁰ Page 5 of Public Health England, *Sugar Reduction: The Evidence for Action*, October 2015, <https://www.gov.uk/government/publications/sugar-reduction-from-evidence-into-action>.

⁶¹ There is evidence that efforts to encourage the food industry to lower the salt contents of products have been successful in reducing dietary salt. See R. Griffith, M. O'Connell and K. Smith, 'The importance of product reformulation versus consumer choice in improving diet quality', IFS Working Paper W14/15, <http://www.ifs.org.uk/uploads/publications/wps/wp201415.pdf>.

motoring. The government should consider moves towards road pricing that would better address this. The system of alcohol taxation should be reformed in order to target higher-strength alcohol products systematically, as these are disproportionately consumed by heavy drinkers (who are most likely to generate alcohol-induced harm).

Revenues from excise taxes are forecast to fall in the coming years. However, given that the primary justification for levying excise duties is to correct socially costly behaviour, this is not necessarily cause for concern. Indeed, reduction in the consumption of tobacco, fuel and alcohol could lead to an improvement in their net contribution to the public purse if it leads to sufficiently large falls in associated health, environmental and crime costs. Even if this were not the case, there are other, more appropriate ways to raise revenue than levying high taxes on a small number of goods.

Future excise duty policy may include the possibility of levying taxes on other forms of consumption that generate externalities and internalities. One proposal that has garnered support in the public health community is a tax on sugar. While this policy may seem an attractive solution to the growing problem of obesity- and diet-related illness, it should be carefully evaluated in order to avoid generating unintended consequences such as worsening other aspects of dietary health. Diet is multifaceted, which makes designing policy to improve nutrition relatively difficult: while smoking each cigarette, for example, is associated with harm and little obvious good (beyond the immediate gratification of the smoker), consumption of some products that contain sugar also involves the intake of nutrients that can contribute to a healthy diet. This makes the consequences of a broad based tax on sugar uncertain; further evidence of the possible effects is needed.