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OF COURSE SIN TAXES ARE REGRESSIVE

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Contents

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Summary

- There should be no debate about whether taxes on food, alcohol, tobacco and soft drinks ('sin taxes') are regressive. It can be easily demonstrated empirically, and countless studies have done so. As with most indirect taxes, they take a greater share of income from the poor than from the rich in all plausible scenarios.

- Sin taxes are regressive if we look at income groups and are even more regressive if we look at individual consumers. They are regressive in the short term and over the life-cycle. Alcohol taxes tend to be less regressive than tobacco and soft drink taxes as a result of high-income groups spending more money on alcoholic drinks, but they remain regressive in most countries.

- Some advocates for sin taxes claim that they produce health benefits that are progressive, i.e. they disproportionately benefit the poor. Decades of high taxes on tobacco and alcohol in many different countries suggest that this is not true. Despite very high rates of duty, smoking is much more common among low-income groups in Britain and whilst alcohol consumption is lower among these groups, rates of alcohol-related harm are considerably higher.

- Early evidence casts serious doubt on whether sugary drink taxes have 'progressive' health benefits either. Low-income consumers do not seem to have particularly elastic demand for sugary drinks. Even if they enjoyed disproportionate health gains from sin taxes, they would still suffer a net loss to their welfare and the tax would remain regressive in the traditional sense.

- Excise taxes raise significant sums of money and are relatively easy to collect. It is unrealistic to expect government to be entirely funded by taxes on the rich. Not every part of the tax system can be progressive, but advocates should be honest about the disproportionately high burden of sin taxes on low-income households.

Introduction

Are taxes on food, soft drinks, tobacco and alcohol regressive? This is a question that should not need to be asked. Any tax that takes a greater share of income from the poor than the rich is regressive by definition. Nearly all indirect taxes, including VAT, are regressive when applied to everyday goods. Taxes on expensive luxuries that poor people do not buy are generally progressive, but these are few and far between. Expenditure on food, alcohol, tobacco and soft drinks makes up a greater part of household spending among low-income groups and, therefore, any increase in price has a greater impact on them. In the case of sugary drinks, tobacco and some 'junk food', low-income groups not only spend a greater share of their income on them, but also tend to spend more money on them in absolute terms.

There should be no debate about this. It is a basic truth that can be easily demonstrated empirically, and countless studies have done so. However, an issue of the *Lancet*, published in May 2018, casts doubt on it. The medical journal published a series of articles extolling the virtues of taxes on food, alcohol, soft drinks and tobacco as a way of improving the health of the population. The issue was introduced by Lawrence H. Summers, the co-chair of the Task Force on Fiscal Policy for Health, an organisation founded by the billionaire businessman and former mayor of New York City Michael Bloomberg, who has spent millions of dollars campaigning for 'sin taxes' around the world. According to Summers (2018: 1975):

> One of the most common arguments used to oppose taxing tobacco, alcohol, or sugary beverages is the claim that such taxes are regressive—that it is unfair to make poorer people pay a larger share of their limited household incomes to consume these products than richer people. Although this argument may look appealing, clear thinking combined with good evidence reveals its many fallacies.

Elsewhere in the same issue, Nugent et al. (2018) wrote:

> 'Taking many factors into account (consumption patterns, responsiveness to price changes, potentially averted medical costs, opportunities to use revenue to mitigate unintended effects on the poor, and the overall financial effect of tax increases), there is no reason to believe that price policies will be regressive.'

When reported in the media, the message from the *Lancet* became 'Taxes on alcohol, tobacco, and soft drinks are fair' (*British Medical Journal*) and 'Tax sugar, alcohol and tobacco to help the poor, say experts' (*Guardian*). In this paper, we shall look at the economic effects of 'sin taxes' and examine the arguments for viewing them as progressive.

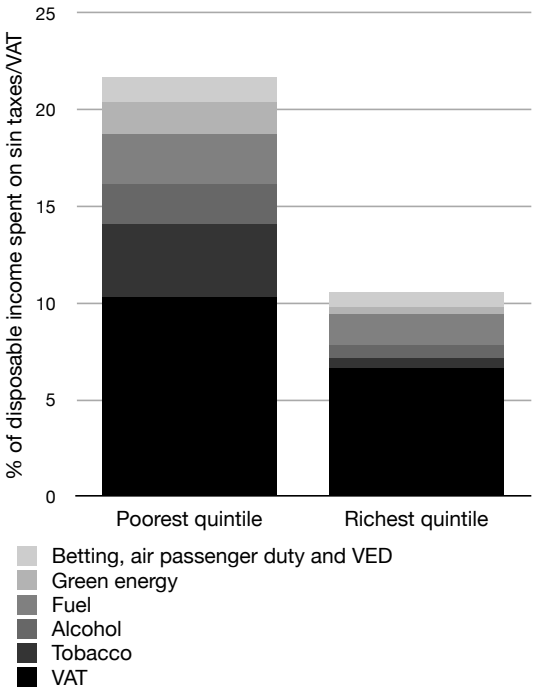
Are sin taxes regressive?

A tax is regressive when it takes a larger percentage of income from the poor than from the rich. This includes sales taxes and excise taxes on everything from snacks to tampons, along with fixed user fees and some direct taxes, such as the poll tax. By contrast, a tax is progressive when it takes a greater share of income from the rich than from the poor, either because there is a *de jure* or *de facto* exemption for the poor (such as a tax on sports cars) or because it is graduated (such as income tax).

It is not sufficient for people on low incomes to spend less money on a product for a sales tax to be progressive. Since the incomes of the top quintile are typically several times larger than the bottom quintile, expenditure by the poor would need to very much lower for a sales tax to be progressive. With everyday products such as food and alcohol, this is rarely the case. With tobacco and sugary drinks, expenditure by the poor tends to be higher not just in relative terms but also in absolute terms, making any 'sin tax' on these products doubly regressive.

This is not difficult to prove empirically. In Britain, the poorest fifth of households typically spend twice as much of their income on indirect taxes than the richest fifth. Figure 1 shows the percentage of disposable income taken in indirect taxation from Britain's richest and poorest quintiles in 2011/12 (Snowdon 2013: 30). With the sole exception of airline passenger duty, all of these taxes took a greater share of income from the poor than from the rich. Using data from the USA, Hoffer et al. (2015) quantified the effects of taxes on twelve products - alcohol, cigarettes, fast food, cookies, cakes, crisps, confectionery, donuts, bacon, fizzy drinks, items sold from vending machines and out-of-home meals - and found that they were regressive in every case.

Figure 1: Percentage of income spent on indirect taxation by the UK's top and bottom quintiles



Many studies have shown the regressive impact of taxes on food, alcohol, tobacco and soft drinks; the very taxes that the *Lancet* wants to see increased. Often the studies are written by proponents of such taxes who acknowledge the added financial burden on the poor even while advocating for them. Lorenzi (2004: 61), for example, accepts that '[s]in taxes are regressive in practice if not in their design' and Sharma et al. (2014: 17) accept that a 20 percent tax on sugar-sweetened beverages would take three times as much from lower-income households than from higher-income households, as a percentage of disposable income.

A systematic review of the literature on sugary drink taxes found that '[a]ll of these studies reported the tax to be financially regressive whereby lower-income households would pay a greater proportion of their income in additional tax' (Backholer et al. 2016: 11). The findings of Chudá and Jansky (2016: 445), who use empirical evidence from the Czech Republic, 'confirm the overwhelming evidence from other countries, that fat taxes are regressive in income.' Chouinard et al. (2015) found that taxes on high-fat foods (in the USA) are 'extremely regressive, and the elderly and poor suffer much greater welfare losses from the taxes than do younger and richer consumers.' Interestingly, they also found 'almost no behavioural effect', with even a 50 per cent tax only lowering fat consumption by three per cent (ibid.: 20). Badenas-Pla and Jones (2003: 130) note that 'excise taxes on alcohol and tobacco are regressive with respect to income (the usual measure of ability to pay), if poorer and more affluent consumers smoke and drink at the same rate. The regressivity is exacerbated if the prevalence is inversely related to income.'

The regressive impact is plain to see if we look at expenditure of whole income groups (quintiles, deciles etc.), but since not everybody in the group consumes the taxed product, we also need to look at the expenditure of individual consumers. When we do this, the impact is even more pronounced. Farrelly et al. (2012) found that expenditure on tobacco among low-income smokers in New York City increased from a sizeable 11.6 per cent to a staggering 23.6 per cent of disposable income following large rises in the excise tax on cigarettes. Across the USA in general, low-income smokers spent 14.2 per cent of their income on cigarettes in 2010/11 whereas high-income smokers spent just 2.2 per cent (ibid.).

Such taxes are not just regressive in the short-term. They also tend to be regressive over the course of a lifetime. Lyon and Schwab (1995: 405) found that the regressivity of cigarette taxes in the life-cycle is 'virtually identical' to the regressivity over one year (i.e. highly regressive). Alcohol taxes become 'slightly less regressive' if they are studied over the lifecycle but they remain 'firmly regressive' compared to general sales taxes (ibid.).

The regressive nature of such taxes was even apparent in the issue of the *Lancet* which implied otherwise. It included a study by Sassi et al. which focused on middle- and low-income countries where wealthier people tend to consume more tobacco, alcohol, snacks and soft drinks than the poor. Despite this, the authors were forced to conclude that '[l]ow income households bear the largest tobacco tax burden consistently across all countries'. When it came to 'price policies targeting soft drinks and snacks … again, the low-income households consuming these products tend to bear the largest financial burden' (Sassi et al. 2018: 2067). Alcohol taxes were the only partial exception. They took a larger share of income from the richest quintile, but only because there were more teetotallers in the poorest quintile. When rich drinkers were compared to poor drinkers, 'the burden borne by just the low-income households that consume alcohol is proportionately larger than the burden borne by high-income households consuming alcohol' (ibid.).

Progressive for health?

Some of those who portray sin taxes as progressive have a more nuanced argument than outright denial of the facts. In his *Lancet* editorial, Lawrence H. Summers argues that they could be progressive if viewed from different perspectives. He says firstly that the burden of illness related to excessive consumption of food, alcohol and tobacco is regressive, with those on low incomes more likely to die prematurely from non-communicable diseases. This, in turn, means the cost of treating these diseases is regressive and 'poorer households are more likely to incur catastrophic costs than wealthier ones.' Secondly, he says that 'the revenue raised by health taxes can further benefit poorer households when it is used progressively.'

None of these arguments refute the basic fact that sin taxes are regressive in the generally accepted sense of the term, but they do imply that there could be compensating benefits which may disproportionately favour the poor. In an interview with Christine Lagarde in April 2018, Michael Bloomberg made this point more crudely:

> Some people say taxes are regressive, but in this case - yes, they are. That's the good thing about them. Because the problem is in people that don't have a lot of money, so higher taxes should have a bigger impact on their behaviour and how they deal with themselves. (IMF 2018)

The suggestion here is that the people who can least afford to pay the taxes will be the first to abandon the taxed products. In economic terms, their demand is more elastic. This makes intuitive sense and there is some evidence for it. In the 1990s, Farrelly and Bray (1998: 1979) found that low-income smokers were more likely to quit or reduce cigarette consumption as a result of higher taxation and calculated that their elasticity of demand for cigarettes was -0.29 as compared to -0.17 for high-income smokers.

Townsend et al. (1994) came to a similar conclusion using British data from 1972-1990.

It is a fact that people on low incomes are less likely to drink alcohol than the rich. This can plausibly be attributed, in part, to the fact that alcohol is less affordable to these consumers. But it is also a fact that people on low incomes are more likely to smoke cigarettes than the rich. In Britain, the smoking rate is twice as high among those who earn less than £20,000 a year than it is among those who earn more than £40,000 (ONS 2018). Demand for tobacco among low-income smokers may have been more elastic in previous eras, but this no longer seems to be the case in rich countries. As Franks et al. (2007) concluded after studying the effect of cigarette tax rises in the USA between 1984 and 2004:

> [I]ncome-related smoking disparities have increased… further significant increases in cigarette tax are likely to aggravate continuing inequities in our society, and through the economic burden associated with continued smoking participation of low-income persons, may result in other adverse health consequences.

Evidence from New York, where cigarette taxes have risen dramatically, suggests that lower income smokers 'have not had a greater response to higher taxes than smokers with higher incomes' (Farrelly et al. 2012). Remarkably, the smoking rate among people earning less than $25,000 did not decline at all in New York City between 2003 and 2010 despite steep tax hikes. As Farrelly et al. (ibid.) note:

> Some have argued that because low-income smokers are more responsive to cigarette price increases than higher income smokers, increases in cigarette taxes may not be regressive. That is, they do not place a disproportionate financial burden on low-income smokers. However, the current study shows that even in the state with the highest cigarette tax, the lowest income group continues to smoke at a much higher rate than the higher income groups.

Most Western countries have been taxing cigarettes at ever-increasing rates for decades. These natural experiments allow us to see whether people on low incomes are more responsive to increases in the price of tobacco. The evidence is clear: they are not. In the 1960s, smoking rates were similar across all socio-economic groups in Britain. Today, after years of heavy taxation, smoking is much more common among the poor.

Moreover, as Public Health England (2018) notes, that there is 'an ever widening gap [in smoking rates] between people in routine and manual occupations and those in managerial and professional posts'. It is impossible to argue that the poor have disproportionately benefited from high tobacco taxes from a financial perspective and it is very difficult to argue that they have benefited from a health perspective.

Even some supporters of tobacco tax rises acknowledge that their regressive financial impact is not offset by the alleged progressivity of its health impact. Writing in *Tobacco Control*, a dedicated anti-smoking journal, Hirono and Smith (2018: 229-230) note that 'tobacco tax is regressive' and add that:

> Available research does not sufficiently address the question of whether, among low-income smokers, the overall benefits of further tobacco price increases (ie, quitting, cutting down, reduced smoking uptake, lower secondhand smoke exposure and more available money among those who quit) outweigh the risk of harm from financial hardship for those who do not quit or reduce their smoking.

Nor is it clear that alcohol taxes are particularly beneficial to the health of the poor. People on low incomes are more likely to be teetotal than wealthier people and they are more likely to stay within government drinking guidelines. It is plausible that the price of alcohol is one reason for this, particularly in countries with high levels of absolute poverty. As noted above, the tendency of wealthier people to drink alcohol makes alcohol taxes less regressive in some middle- and low-income countries, but are they progressive in terms of health?

It seems not. Despite higher rates of abstinence and lower rates of consumption, low-income groups suffer higher rates of alcohol-related harm. This is known as the 'alcohol harm paradox' and it may be partially explained by the tendency of low-income drinkers to consume alcohol 'at extreme levels' (Lewer et al. 2016). Whatever the reasons, taxes on alcohol have not led to people on low incomes having better alcohol-related health outcomes, even though they drink less alcohol.

Alcohol and tobacco taxes are well established around the world. Sugary drink taxes are a newer idea but the available evidence does not suggest that they provide low-income consumers with disproportionate health benefits either. Sugary drinks taxes have never been shown to reduce

overall calorie intake or obesity in any of the places where they have been tried, but even if we make the assumption that they can yield health benefits, the poor would have to reduce their consumption of calories from soft drinks by more than the rich for them to be progressive in this narrow sense.

There is scant evidence that this has ever happened or ever would happen. At best, the evidence is mixed. A model produced by Zhen et al. (2014) found that a sugary drinks tax in the USA would lead to low-income groups reducing their daily calorie intake by more than high-income groups, but another study led by the same researcher found that demand was less elastic among low-income households (Zhen et al. 2011). A study by Colchero et al. (2016) concluded that low-income households in Mexico reduced their consumption of sugary drinks by more than high-income households after a tax was introduced in 2014. By contrast, a study based on a similar tax in Chile found that the high-income group reduced its consumption while the low-income group did not reduce its consumption at all (Nakamura et al. 2018). Both of these modelling studies should be treated with caution, however, since the underlying data do not show any decline in overall sales at all.

Finkelstein et al. (2010) estimated that a 20 per cent sugary drinks tax would lead to (trivially small) reduction in daily energy intake of 4.2 calories and this was entirely due to middle-income households, with no decline in consumption among high-income or low-income groups. Briggs et al. (2013a) modelled the impact of a 20 per cent sugar tax in the United Kingdom and found that high-income groups have more elastic demand than low income groups and that the tax would lead to high-income consumers reducing their calorie intake by more than low-income consumers (23 calories compared to 19 calories per day). The same researchers reached a similar conclusion when modelling a 10 per cent tax in Ireland (Briggs et al. 2013b), with the overall impact on energy intake being negligible (2.1 fewer calories consumed per person per day) and the decline being slightly greater among high-income groups.

Sharma et al. (2014) modelled a 20 per cent sugary drink tax in Australia and, in contrast to Lal et al. (2017), concluded that low-income groups are least responsive to price rises. Lin et al. (2011) modelled a 20 per cent sugar tax in the USA and found that low-income demand among adults was slightly more elastic (-1.29 as compared to -0.95 for the high-income group), but significantly less elastic among low-income children. As in the

other studies, it was noted that 'low-income households would bear a larger tax burden than high-income households' (ibid.: 338).

Taken together, the evidence does not support the claim that sugary drink taxes are likely to bring greater health benefits to the poor than to the rich. The impact on overall calorie consumption is usually trivial and tends to be weaker among low-income groups. If we view calorie reduction as a benefit and tax as a cost, it seems that middle- and high-income groups enjoy a disproportionate benefit while low-income groups bear a disproportionate cost. This is exactly what we have seen over a period of many years with tobacco taxes and, to a lesser extent, alcohol taxes. It should come as no surprise. Price is only one of many influences on demand and, as Hoffer at al. (2015: 9) explain, demand is inelastic for all the products that 'public health' campaigners target:

> Gallet (2007), for example, finds the median own-price elasticity for alcohol to be –0.497. Gallet and List (2003) report a median price elasticity estimate for cigarettes of –0.40. According to Andreyeva, Long, and Brownell (2010), the median price elasticity estimates are –0.81 for food eaten away from home, –0.79 for soft drinks, and –0.34 for sweets and sugars… Consumption, thus, is very persistent for all those targeted goods. The quantities demanded decline, as theory predicts, but not by much, thus explaining why a tax-ridden price increase has a less than proportional effect on purchases and, hence, on the adverse health outcomes associated with consumption.

Finally, it should be noted that the idea of 'progressive' health benefits is not an economic concept. It is based on paternalistic values that do not make sense from the perspective of standard economic theory. Although some taxes on unhealthy products can be justified on Pigouvian grounds, those who claim that sin taxes offer 'progressive' health benefits are not making a Pigouvian argument.[1] They are making a value judgement that health benefits are more valuable than the benefits of consumption. But unless consumers are unaware of the risks, this can only result in a deadweight loss because risk is factored into the cost of consumption. As Remler (2004: 229) says: 'In general, economists respect people's choices.

1 'The Pigouvian rationale for correcting such market failures rests on a set of strictly technical assumptions. The reasons for taxing sin, by contrast, are much more expansive than these considerations imply, and, moreover, they have morphed over time. As the justification for sin taxes shifts from solving a social engineering problem to a more explicit paternalistic approach, the logic of the argument shifts' (Hoffer at al. 2014: 49).

If they prefer to buy something and it is made too expensive for them, we say that they are worse off.'

Therefore, even if people on low incomes enjoyed disproportionate health gains from sin taxes, they would still suffer a net loss to their welfare. This argument is almost academic, however, since they do not.

Mitigation?

Several other arguments have been put forward by those who acknowledge that paternalistic sin taxes are financially regressive but nevertheless endorse them. Some people, including Summers, have suggested that the revenue raised from such taxes be spent on projects that benefit the poor. Others have argued that it is the overall tax system that should be progressive, rather than individual taxes. Still others have argued, in the case of sugary drinks taxes, that the sums of money involved are trivial.

In the latter camp are Sharma et al. (2014) who conclude that a 20 per cent tax on sugar-sweetened beverages would take more money from low-income groups than from high-income groups, both in absolute and relative terms. However, they portray the sums involved as 'negligible', amounting to $18 per annum for low-income households and $15.17 per annum for high-income households. It is true that the cost is small in absolute terms, but that is only a matter of degree. As a share of income, the poorer households would pay ten times as much as the richer households (0.21 per cent for the former and 0.025 per cent for the latter). Moreover, sugary drink taxes are only one of several sin taxes imposed on them. As Figure 1 showed, their combined impact is large and becomes larger as tax rates rise and the range of products and activities becomes broader.

Just as each new sin tax increases the burden on the poor, so each new sin tax makes the overall tax system more regressive. In theory, it is always possible to make the tax system more progressive, but it is far from obvious how the introduction of another regressive tax advances this goal. Sassi et al. (2018: 2059) argue that the 'larger financial burden on low-income households' could be 'mitigated by a pro-poor use of the generated tax revenues'. But what kind of 'pro-poor use'? Direct redistribution is a dead end since it would undermine the paternalistic objective - charging an extra £100 for a product is no disincentive if your government has just given you £100.

Some advocates of food and soft drink taxes propose subsidies on fruit and vegetables but none has been able to explain how such a scheme would be implemented, and it would disproportionately benefit the rich in any case, since fruit and vegetable consumption rises with income. Some have suggested that the money be used to give people free gym memberships but this, again, amounts to middle-class welfare, taxing the poor to subsidise the lifestyles of the more affluent. Using the money to provide educational campaigns, weight loss classes and school projects may bring some benefit to the poor but it is unlikely to offset the out-of-pocket costs of the tax. The primary beneficiaries of 'public health' educational and advocacy projects are middle class graduates for whom health NGOs and quangos act as job creation schemes. Insofar as these initiatives can be viewed as progressive, they would be more 'pro-poor' if they were funded out of general taxation.

If there is a way of making the poor benefit financially from such taxes, campaigners have yet to provide a coherent roadmap for it. In any case, history shows us that tax hypothecation is rare. The public are more likely to support sin taxes if they are told that the revenue will be ring-fenced for health or education, but the money is usually diverted towards general state spending sooner or later (Hoffer and Pellillo 2012; Jacobson and Brownell 2000). Tobacco and alcohol taxes have been used to finance routine government expenditure for centuries and if the USA is any guide, sugary drink tax revenue will be treated no differently (Tanenbaum 2018).

Conclusion

‘Frankly, I am very surprised that Secretary Clinton would support this regressive tax,’ said Senator Bernie Sanders in April 2016 when he was running for the Democratic presidential nomination. ‘A tax on soda and juice drinks would disproportionately increase taxes on low-income families in Philadelphia’ (Fredericks 2016). Sanders was widely criticised by soda tax campaigners for his intervention, but he was right. Taxes on sugary drinks, like taxes on food, alcohol and tobacco, are unambiguously regressive. Whatever their other merits and faults, they almost invariably take more from the poor than from the rich. Since demand for these products is inelastic, it is highly improbable that such taxes could bring about sufficient behavioural change among low-income groups to make them progressive.

The inelasticity of demand is precisely the reason why sin taxes are such reliable revenue-raisers. ‘When the elasticity is low,’ write Lockwood and Taubinsky (2017: 3), ‘the tax has little effect on behaviour and thus little corrective benefit—and so its regressivity costs dominate.’ There is little evidence to support the claim that taxes on sugar, alcohol and tobacco yield disproportionately large health benefits for the poor. If anything, the evidence points in the opposite direction. But even if such benefits were real it would not change the basic economic fact that such taxes are regressive and remain regressive regardless of whether they are large or small and regardless of how progressive the overall tax system is.

Excise taxes raise significant sums of money and are relatively easy to collect. It is unrealistic to expect government to be entirely funded by taxes on the rich. Not every part of the tax system can be progressive, but advocates should be honest about the disproportionately high burden of sin taxes on low-income households.

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