

Fiscal policy instruments to improve diet

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Introduction

The key question discussed in this note is the following: Does altering the cost of unhealthy, energy-dense foods relative to that of more healthy, less dense foods through the use of fiscal pricing (tax or subsidy) policies change food consumption pattern and overall diet enough to significantly reduce individuals' weight outcomes? Hence, this note is *not* about micro level financial incentives which have been covered in a sizeable number of recent systematic reviews (Wall et al 2006).

There is good reason to at least hope that increasing the price of "unhealthy" food and/or decreasing the price of "healthy" food could make the desired difference to people's consumption patterns. Proponents of food-related fiscal policy also draw comfort from the well-documented (cost-) effectiveness of tobacco taxation. To the economist, the demand for specific food products depends on their own prices, the prices of other food products and of other goods, income, and other factors that may shape preferences, e.g. advertising or social norms. If the price of unhealthy food products relative to healthy ones rises, that should increase the demand for healthy food (relative to unhealthy food). Such a change in relative prices can in principle be brought about by taxation or subsidisation. However, the desired impact on people's weight will only be achieved if individuals do not respond by e.g. substituting the now taxed unhealthy food product by another unhealthy and yet untaxed food product, or by reducing their physical activity (Powell & Chaloupka 2009).¹

The alleged or actual existence of "market failures" – an essential rationale for government action to the economist, though much less so to the public health advocate – may also justify the idea to at least consider the correction of market incentives, among other means possibly through fiscal policy instruments²:

- (1) Those that "over-consume" food likely incur higher health care costs than those that don't, who, however, help carry a major share of the cost burden in a collectively financed health insurance system ("*negative external costs*");
- (2) There may be *asymmetric information* between consumers and producers in that the consumers' information about a healthy diet may have been distorted as a result of massive

¹ The DH obesity strategy "Healthy weight, healthy lives" (2008) supports this idea in that it highlights the potential of changing financial incentives in helping reduce obesity, while at the same time emphasising the need for a better understanding of the role of financial incentives.

² The fiscal policy intervention can only be thought of as one out of several possible interventions that might correct the market imperfection, and they may not necessarily be the first choice to economists. For instance, the first best response to information asymmetries would rather be information campaigns.

advertising efforts from fast-food companies, which are a typically a multiple of government advertising expenditures to promote healthy eating.

- (3) Some people may have *time-inconsistent preferences* that would mean that not only the external costs mentioned above provide a rationale for intervention but in addition some part of the internal costs, i.e. mainly the health damage done by the over-consumer of food to herself.
- (4) *Children and adolescents* hardly fit the ideal traditional model of the rational, forward looking human being, and thus actions may need to be taken to influence their dietary behaviour today to avoid long term consequences they would have liked to avoid, had they acted rationally.

If indeed one or more of the above market failures apply, there remains the need to demonstrate the effectiveness of food-related fiscal policy interventions. The following section briefly reviews the evidence, as it has largely been assessed in a selection of recent systematic and non-systematic reviews.

Evidence review

A number of recent studies have reviewed the existing evidence for or against the case for fiscal policy to improve diet (Andreyeva et al 2010; Thow et al 2010; Powell & Chaloupka 2009; Goodman & Anise 2006; Caraher & Cowburn 2005, Cash & Lacañilao 2007). The number of primary studies published on the subject has grown in recent years, even if the overall amount of research still appears comparatively limited. All reviews have focused on the English language evidence (partly taking into account grey literature) and most have been limited to the US evidence, which very likely accounts for the greatest share of the available evidence.

In what follows I discuss mainly the findings of the three most recent reviews, i.e. Andreyeva et al (2010), Thow et al (2010) and Powell & Chaloupka (2009). Each of these reviews has a slightly different, if overlapping focus, and taken together they are more comprehensive and systematic than the earlier ones.

Andreyeva et al (2010) reviewed 160 US-studies on the price elasticity of demand for major food categories in order to assess mean elasticities³ by food category and variations in estimates by study design. Price elasticities for foods and nonalcoholic beverages ranged from 0.27 to 0.81 (absolute values), with food away from home, soft drinks, juice, and meats being most responsive to price changes (0.7–0.8). As an example, a 10% increase in soft drink prices should reduce consumption by 8% to 10%.

³ Elasticities measure the percentage change in demand for a given product in response to a 1% increase in its own price. Demand is considered relatively inelastic (i.e. insensitive to price) if the elasticity is below one and it is considered elastic if the value is greater than one. To make a substantial impact on food demand one would ideally want to have higher values of price elasticities. Food demand in general though tends to be relatively price inelastic, but it is usually more elastic among lower income groups compared to higher ones. Other relevant elasticities to take into account are cross-price elasticities and income elasticities of food demand.

This is partly encouraging evidence for those advocating the use of fiscal policy to influence food demand. However, the implications only reach so far in that they do not inform us about what if any effect the price increase may have had on people's weight outcomes. As mentioned above, people may substitute one food category by another unhealthy, high calorie one, with the end result being no change or even an increase in weight, or they may substitute within one food category⁴. (They may also respond to an increased consumption of healthy, low calorie-food by reducing physical activity. We don't really know.)

To develop a more complete idea as to the potential for price changes (which could or could not be brought about by a fiscal intervention) to actually reduce obesity, Powell & Chaloupka (2009) have focused their review exclusively on studies that measured the effect of food prices on weight outcomes (again in the US only, published between 1990 and 2008). Only nine studies met their inclusion criteria. They essentially found that small price changes make no or little difference to weight, while larger ones may lead to significant changes in weight outcomes. Hence, they concluded – on the basis of this less than abundant body of evidence – that small taxes or subsidies would not be likely to produce significant changes in BMI or obesity prevalence but that nontrivial pricing interventions might have a measurable effect on Americans' weight outcomes, particularly those of children and adolescents, low-SES populations, and those most at risk for overweight. Even though they would have only a small impact on individual behaviour, such interventions could have a large impact at the population level when applied broadly. The particularly encouraging effect for children/adolescents, low SES populations and those at risk of overweight is derived from the observation that their weight was often found to be disproportionately responsive to price changes. (Yet very few studies examined such differential effectiveness in specific population sub-groups.)

Subsidies of fruits and vegetables also were estimated to improve children's and adolescents' weight outcomes. In addition to greater price elasticity estimates for heavier children, such subsidies were also shown to have greater effects on children from low-SES families. The empirical evidence reviewed by Powell and Chaloupka thus supports a multipronged approach, especially for children and adolescents, of changing relative prices by both taxing less healthy, energy-dense foods and subsidizing healthier, less-dense foods. Subsidies specifically directed toward low-SES households not only may reduce weight but also may offset equity concerns related to food taxes (see discussion below).

The focus of the review by Thow et al (2009) was again slightly different in that they searched the English-language published and grey literature for empirical and modelling studies worldwide on the effects of monetary subsidies or taxes levied on specific food products on consumption habits, body weight and chronic conditions. Empirical studies were dealing with an actual tax, while modelling studies predicted outcomes based on a hypothetical tax or subsidy.

Twenty-four studies, almost all of which in high-income countries, met their inclusion criteria, including 8 empirical and 16 modelling studies. Nine studies assessed the impact of taxes on food consumption only, 5 on consumption and body weight, 4 on consumption and disease and 6 on body

⁴ Using commercial scanner data, Griffiths et al (2009) are among the first to point out and measure the potentially important substitution that occurs within one food category, in their case butter products.

weight only. Very similar to Powell & Chaloupka they found that in general, taxes and subsidies influenced consumption in the desired direction, with larger taxes being associated with more significant changes in consumption, body weight and disease incidence. However, studies that focused on a single target food or nutrient may have overestimated the impact of taxes by failing to take into account shifts in consumption to other foods – a point already raised above. The quality of the evidence was generally considered low.

Concluding remarks

In judging whether taxation and/or subsidisation of food products or categories should be recommended as a means to help reduce obesity at population level, a few additional issues need to be borne in mind that could not be discussed here:

- *Methodological and data challenges* in the research: e.g. disentangling the potential price effect requires adequately controlling for confounding factors, such as the availability of food stores and restaurants, not all studies have had information on; existing data on food prices has limitations that may affect the empirical results (eg price data is often not available at lower geographic units); much of the data on weight used in the available surveys is self-reported, possibly leading to non-systematic measurement bias; the underlying design of the survey data at hand to study the relationships varies greatly, and many only use cross-section data, which offers limited potential to explore causal relationships between price and demand.
- *Are food taxes regressive?* The answer critically depends first on how “regressiveness” is defined and measured⁵. Because lower SES groups consume more of the unhealthy, high-calorie commodity that is to be taxed, the default notion (which is probably ultimately true) is that any excise tax such as tobacco and food taxes hurts the poor more than the rich, both using a narrow expenditure based measure of regressiveness and a broader welfare based one. However, since lower SES groups tend to be more price sensitive, they will adjust their behaviour more than the rich, so that after the price has increased, they may spend much less on the taxed food than they previously did, thereby reducing the degree of regressiveness or even turning the effect into a progressive one. To my knowledge there is currently no empirical evidence though to support the latter optimistic view. The likely regressive effect of taxes could, however, be compensated by subsidies, possibly targeting lower SES groups.
- *Food tax as revenue raising device?* The fact that food demand tends to be rather price inelastic offers the potential to use the instrument as an effective (if again regressive and therefore politically challenging) means to raise revenue (Chouinard et al 2007), which at least in principle could be used to fund other interventions that might more effectively affect dietary and weight outcomes. There appears to be mixed evidence as to what impact the

⁵ See Remler (2004) for a useful clarification and discussion of different concepts and measures of regressiveness in the context of tobacco taxation.

use of the additional revenues might have on the acceptability of a food tax among the population.

- *The actual design and implementation of food taxes:* unlike with the tobacco it is rather difficult to identify the health-damaging categories of food and tax them (or the healthy ones and subsidise them). Ideally one would want to just tax excess consumption of unhealthy and high calorie foods, because for instance some fat is important for the human diet. While food taxes could be based on nutrient content such as fat, it will be more feasible to tax specific categories of food that are deemed “unhealthy” or at least of low nutritional value. Some caution may, however, be needed when several items within a broad category like fast food are taxed; for example, higher beef prices have been shown to be associated with anemia (Lakdawalla et al 2005).

In sum, turning back to the question posed in the introductory paragraph, there are two conclusions I would draw:

- 1) In light of the slightly more complex nature of food (as opposed to tobacco) consumption, and given the relatively limited evidence, the role that fiscal policy could play in achieving weight loss at a population level *should not be overestimated*.
- 2) In light of the partly encouraging evidence though about the potential combined effects of taxation and subsidisation and about potentially greater price sensitivity among the young, the lower income groups and those most at risk of obesity, the role of fiscal policy *should not be under-estimated either* and does definitely deserve further research and policy attention, especially in the UK.

References

- Andreyeva T, Long MW, Brownell KD. The Impact of Food Prices on Consumption: A Systematic Review of Research on the Price Elasticity of Demand for Food. *American Journal of Public Health*. February 2010, Vol 100, No. 2, 216-222.
- Caraher M, Cowburn G. Taxing food: implications for public health nutrition. *Public Health Nutr* 2005;8:1242–9. doi:10.1079/PHN2005755
- Cash SB, Lacañilao RD. Taxing food to improve health: economic evidence and arguments. *Agric Resource Econ Rev* 2007;36:174–82.
- Chouinard HH, Davis DE, LaFrance JT, Perloff JM. Fat taxes: big money for small change. *Forum Health Econ Policy* 2007;10:2.
- Frazão E, Andrews M, Smallwood D, Prell M. 2007. Food Spending Patterns of Low-Income Households: Will Increasing Purchasing Power Result in Healthier Food Choices? In: *Can Food Stamps Do More to Improve Food Choices? An Economic Perspective*, Economic Information Bulletin Number 29-4. Washington, D.C.: U.S. Department of Agriculture, Economic Research Service.
- Goodman C, Anise A (2006). What is known about the effectiveness of economic instruments to reduce consumption of foods high in saturated fats and other energy-dense foods for preventing and treating obesity? Copenhagen, WHO Regional Office for Europe
- Griffiths R, Nesheim L, O’Connell M (2009). Empirical estimates of a fat tax. Institute for Fiscal Studies, mimeo.
- Lakdawalla, D., T. Philipson, and J. Bhattacharya. 2005. Welfare-Enhancing Technological Change and the Growth of Obesity. *American Economic Review* 95(2):253–57.
- Powell LM, Chaloupka FJ. Food prices and obesity: evidence and policy implications for taxes and subsidies. *Milbank Q* 2009;87:229–57.
- Remler DK. Poor smokers, poor quitters, and cigarette tax regressivity. *Am J Public Health* 2004;94:225–9.
- Wall J, Mhurchu CN, Blakely T, Rodgers A, Wilton J. Effectiveness of monetary incentives in modifying dietary behavior: a review of randomized, controlled trials. *Nutrition Reviews* 2006; 64(12):518-31