



The Danish tax on saturated fat – Short run effects on consumption, substitution patterns and consumer prices of fats



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ABSTRACT

Denmark introduced a tax on saturated fat in food products with effect from October 2011. The objective of this paper is to make an effect assessment of this tax for some of the product categories most significantly affected by the new tax, namely fats such as butter, butter-blends, margarine and oils. This assessment is done by conducting an econometric analysis on weekly food purchase data from a large household panel dataset (GfK Panel Services Denmark), spanning the period from January 2008 until July 2012. The econometric analysis suggests that the introduction of the tax on saturated fat in food products has had some effects on the market for the considered products, in that the level of consumption of fats dropped by 10–15%. Furthermore, the analysis points at shifts in demand from high price supermarkets towards low-price discount stores – at least for some types of oils and fats, a shift that seems to have been utilised by discount chains to raise the prices of butter and margarine by more than the pure tax increase. Due to the relatively short data period with the tax being active, interpretation of these findings from a long-run perspective should be done with considerable care. It is thus recommended to repeat – and broaden – the analysis at a later stage, when data are available for a longer period after the introduction of the fat tax.

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Introduction

Like many other countries, Denmark is facing an increased prevalence of health problems induced by unhealthy diets, including overweight, obesity and a number of associated co-morbidities (WHO, 2008) and there is an increasing awareness of the needs for public regulations to reverse this trend. Increased health care costs due to diet related illnesses represent a burden to the Danish public sector, and the solution is not to be found in raising public revenues through increased income taxation, to support these costs since the room for increased income taxation is limited by concerns for international competitiveness (OECD, 2012). Taxation of unhealthy foods and beverages is considered a tool that meets both these challenges of increasing public revenue and at the same time potentially decrease health care costs. Taxation of an unhealthy food is expected to increase the consumer price of this food, thus providing an incentive for the consumer to buy less of this product and at the same time, the revenue generated from such a tax can be used for financing public expenditures on health or reducing other tax rates.

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The issue of food taxation as a health promoting instrument has been considered in a number of scientific papers (see e.g. review by Mytton et al., 2012). As the actual use of food taxation as a health policy instrument has been very limited (see below), these studies are based on model simulations, derived from econometrically estimated price elasticities. Based on econometrically estimated models of food consumer behaviour, Smed et al. (2007) and Jensen and Smed (2007) have investigated the potential effects of alternative health-related food tax models (including a tax on saturated fat, taxes on all fats, tax on sugar or lower taxes on fruits, vegetables and/or dietary fibres) on food consumption. The finding of this is that such tax schemes may constitute a tool to change dietary behaviour, and with the potentially largest effects on lower social groups. In a simulation study, Mytton et al. (2007) found that taxing sources of saturated fat may lead to a reduction in the intake of saturated fats and despite an associated increase in salt consumption, would be a tool to avert thousands of cardiovascular deaths per annum in the UK. In contrast, Chouinard et al. (2006) studied the impact of a fat tax on the consumption of dairy products, and found a rather inelastic demand for these products, suggesting a low impact on consumption, but a high potential to generate tax revenue. A study by Allais et al. (2010) found that a fat tax has small and ambiguous effects on nutrients purchased by French households, leading to a small effect on body weight in the short run and a larger effect in the long run. Tiffin and Arnoult (2011)

found that a fat tax will not bring fat intake among UK consumers in line with nutritional recommendations and that potential health impacts of a fat tax will be negligible. Nordström and Thunström (2009) found that a tax on saturated fat would be more efficient in changing consumer behaviour than a tax on fat, but the impact on consumption would still be minor, assuming politically feasible tax levels. In these studies it is however assumed that the tax rate is perfectly transmitted to the consumer prices.

Recently, some countries have adopted the approach of introducing new taxes on foods or beverages that are considered unhealthy. In France, a tax on sugared soft drinks was introduced in 2011 (Villanueva, 2011), in Hungary taxes on different ready-to-eat foods (candies, soft drinks, energy drinks, savoury snacks and seasonings) with specified nutritional characteristics were also introduced in 2011 (Villanueva, 2011; Holt, 2011), Finland has in 2011 reintroduced taxes on sweets, which had been abolished since 1999, and more countries are considering the use of tax instruments in health promotion policies (EPHA, 2012). In Denmark, a new tax on saturated fat in food products was introduced in October 2011, as a supplement to existing taxation on sugar, chocolate, candy, ice-cream and soft drinks. The fat tax in Denmark distinguishes itself from the taxes mentioned above by targeting a nutrient which occurs naturally in foods, instead of targeting specific groups of food, and as such this is the first tax of its kind in the world.

An aspect that has hardly been investigated in relation to such food taxation schemes is the taxes' impacts on the formation of consumer prices. As mentioned, most previous (prospective) studies have assumed a one-to-one transmission of the tax rate to the consumer price without taking into account possible market imperfections, due to e.g. imperfect competition or transaction costs (Lloyd and McCorriston, 2004; Meyer and Cramon-Taubadel, 2004; Vavra and Goodwin, 2005). Furthermore, the substitution between different kinds of stores, from e.g. high-end supermarkets to low price discount stores, that the consumer can undertake as response to a tax is not taken into account. The objective of this paper is to make a first assessment of some of the market effects of the Danish saturated fat tax, i.e. we consider the impact on consumption, the impact on market shares for different shop types (discount and high-end supermarkets) as well as the impact of the tax on the formation of consumer prices of some of the product categories presumed to be most affected by the new tax: butter, butter blends,² margarine and oils.

The rest of this paper is organised as follows. The next section provides a description of the Danish fat taxation scheme, and the subsequent two sections provide a theoretical framework and a description of data and empirical methodology. After these methodological sections, results of the analysis are presented, and finally the paper is rounded off with a discussion and questions for further research.

The Danish tax on saturated fat

The tax on saturated fat was part of a larger tax reform taking place in Denmark in 2010. The overall aim of this reform was to reduce the pressure of income taxation rates for all people actively participating in the labour market and to finance this by, among other things, increased energy and environmental taxes and increased taxes to reduce adverse health behaviour.³ The so-called health taxes included upward adjustments in existing taxes on sweet products, soft drinks, tobacco and alcohol. Taxes on sweets,

chocolate, sugar-products and ice-cream were increased by 3.57 DKK (0.48 €) per kg added sugar for sugar products, by 0.81 DKK (0.11 €) per litre for ice-cream, and by 0.30 DKK (0.04 €) per litre for soft drinks with added sugar, whereas the taxation of soft drinks with artificial sweeteners was decreased by 0.30 DKK/l (0.04 €). A novelty in the tax reform was the introduction of a tax on saturated fat in foods. The fat tax was a tax paid on the weight of saturated fat in foods, if the content of saturated fat exceeds 2.3 g per 100 g.⁴ The threshold of 2.3 g saturated fat per 100 g implied that all kinds of drinking milk were exempt from taxation. The tax was levied on food manufacturers and food importers, but was expected to be transmitted onto the consumer prices. Foods determined for exports or animal fodders were exempt from the tax. The tax is set at 16 DKK (2.15 €) per kg saturated fat, which was topped up by 25% value added tax (VAT). The tax came into force on the 1st of October 2011.

Fatty products, such as butter and margarine, are the food commodities for which prices are most affected by the fat tax, due to their high content of saturated fat. Table 1 illustrates the magnitudes of the tax rate, relative to the average market prices of different types of fats in 2010–2011.

Data and empirical models

The data used in this paper originates from GfK Panel Services Denmark (GfK) that among other things maintains a demographically representative consumer panel from all the different regions of Denmark. The data used covers the period from 1st of January 2008 to 1st of July 2012 and is an unbalanced panel that contains approximately 2000 households,⁵ with about 20% of the households replaced by similar types of households each year. Panel households keep detailed diaries of daily purchases. For each shopping trip, the diary-keeper reports purchases of foods and other staples including the date and time of the purchase, the name of the store and the total expenditure on the shopping trip. For almost all goods in all periods, the value and quantity of the product is recorded. For the modelling in this paper, purchases are aggregated to cover weekly aggregates and due to the relatively short post-tax data period we consider only demand for foods that are heavily taxed, i.e. butter, blends, margarine and oil. All prices and expenditure variables are deflated with the official consumer price index from Statistics Denmark to adjust for general inflation. Descriptive statistics of the panel are given in Table 2.

Compared to equivalent numbers from Statistics Denmark, the panel consists of more households located in rural communities and furthermore the main shopper in the panel is older than the average Dane. Concerning education, the distribution described in the table refers to the education of the main shopper and it shows that there are more main shoppers with a short education compared to Statistics Denmark and less with no further education. The main concern is, however, not the representativeness of the panel measured on socio-demographic variables, but a potential extended focus from panel members on prices and food purchases due to the membership of a food panel. This might lead to larger price sensitivity for panel members than is average for the Danish population.

In order to examine and illustrate the market reactions to the new tax, we take departure in an economic model, where retailers behave as (local) monopolists, when it comes to their supply of fat products, such as butter, blends, margarine and oils. As these types of products normally constitute a minor share of the shopping baskets of consumers, this implies that the prices of these products

² Hereafter called blends.

³ For more on the overall tax-system change see http://www.skm.dk/public/dokumenter/engelsk/Danish%20Tax%20Reform_2010.pdf.

⁴ The fat tax is described in Smed (2012) and in <https://www.skat.dk/SKAT.aspx?old=1950194&andvid=0> (in English).

⁵ For more information on GfK Denmark see <http://www.gfk.dk/>, Andersen (2008) or Smed (2008).

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