Public Policy Towards Obesity and Food Consumption

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ERC Advanced Grant MAPFAN
Motivation

- Obesity is a major public policy issue
  - abnormal or excessive fat accumulation that may impair health
- According to the World Health Organization (WHO)
  - worldwide obesity has more than doubled since 1980
  - 39% of adults overweight in 2014
  - 13% obese
  - most of the world’s population live in countries where overweight and obesity kills more people than underweight
  - 42 million children under the age of 5 were overweight or obese in 2013
- A report by McKinsey Global Institute made headlines in November 2014
  - suggested that obesity was one of the top three global issues that required policy intervention
Policy concern not only about obesity

- Also concern about rise in other diet-related disease
  - excessive salt, sugar consumption
  - low fruit, vegetable and wholegrains consumption
  - associated with increased risk of hypertension, cardiovascular disease, cancers, etc.
What are the policy options?

- McKinsey report and WHO document a large range of policies that have been implemented to target obesity
- Of the 74 policies that McKinsey document
  - 45 were focused on food behaviours (e.g. labelling, taxes)
  - 11 focused on exercise (e.g. cycling infrastructure, subsidised gym membership)
  - 13 targeted both - the balance between food and exercise (e.g. education, health counselling)
  - 5 others (e.g. surgery)

- We are interested in how to understand the potential impact and effectiveness of these different policies
- In order to evaluate the effectiveness of a policy we first need to be clear about what it is aiming to achieve
What role for government?

• Well functioning market yields efficient allocation of goods
  • if fully informed rational individuals
  • if firms are price takers, so prices reflect costs

• Why do food markets fail to deliver good outcomes?
  • are individuals fully informed about the characteristics and consequences of food consumption?
  • are individuals “rational” when they make food consumption choices?
  • do prices accurately reflect costs?
  • are there
    • information or cognitive failings?
    • externalities associated with consumption?

  • combined with market power by firms?
Externalities from consumption?

- If consumption imposes costs on others
  - an individual may not take these costs into account
  - this will lead to excessive consumption from a social perspective

- What externalities are there from food consumption?
  - costs of healthcare
  - lost economic output due to sickness absence, premature mortality and lower productivity
Externalities on your future self

• BUT need to be careful
  • many of these costs fall on individual, not others, so are not truly externalities

• Consumers might not be fully forward looking
  • in which case the externality is largely on the person’s “future self”

• children
• individuals with self-control problems
Information failings

- People may be capable of processing the relevant information, but lack the necessary information to make informed choices.

- The cost of processing information may be high, people may be cognitively unable or unwilling to process it, even if all the information is there.

- The policy response to these will differ.
Information failings

• Consumers may be badly informed about:
  • their own nutritional needs
  • the nutritional characteristics of a specific food product
  • costs associated with the consumption of certain foods (particularly when the costs are uncertain and are borne in the future)

• Firm advertising might conflict with other information sources
  • information provision by firms can be misleading
  • e.g. a firm may highlight that its product is low in fat while failing to tell customers that it is high in sugar
  • firms might also intentionally obfuscate
How do we know which policies will work?

- **Standard ex post policy evaluation**
  - interventions are rarely random (so hard to find a good control group)
  - applicability to different circumstances limited
  - many interventions have not been implemented

- **Ex ante policy evaluation**
  - estimate a “structural model”
  - allows us to think carefully about two particularly important issues
    - **equilibrium effects**, impact of policy when we take into account that firms may respond to policies in ways that alter the effectiveness of the policy, e.g. by changing price of goods, product offering, or way products are advertised
    - **welfare effects**, using policy to change peoples’ behaviour will likely entail costs and benefits, how do these balance out
What policies are we considering?

• Education and information campaigns
  • 5-a-day campaign
  • food labelling

• Fiscal measures
  • taxes and subsidies, intentional and unintentional

• Regulation
  • advertising
  • reformulation
  • availability of products

• Cash transfers
  • conditional cash transfers

• “Nudge” policies
Information campaigns

- Government information campaigns attempt to directly mitigate the problem of consumers not having all the relevant information
- Is this the relevant market failure?
- Expensive to provide effective information
- If the message is complex people may not be able or willing to process the information (e.g. “don’t drink drive” is a simple message, “eat a healthy diet” is a complicated message)
- Need to take account of potential supply-side responses, if information changes consumers behaviour, so shifts in the demand curve this will e.g. change optimal price for a firm to charge
Regulation

- The food industry is heavily regulated e.g. for health and safety reasons
- Recent move to extend to health related regulation
  - ban junk food in schools
  - salt reformulation
  - advertising restrictions
  - etc.
What would be the impact of banning advertising?

• One proposal is to extend restrictions to advertising “junk foods” (WHO recommendation)
• We develop and estimate a model of junk food market where firms produce differentiated products and have two strategic variables - advertising and price
  • what is the impact of advertising on consumers?
    • does advertising one product steal market share from other products? if so, no direct effect of ban on total quantity
    • does advertising increase market demand? if so, direct effect of ban would be to decrease quantity
  • advertising only one of strategic variables available to firms
    • ban may lead firms to respond by changing other strategic variables (e.g. prices)
    • if firms lower prices, because now only competing in prices (not advertising), this could increase quantity
The contribution of our work

• Develop model of consumer demand and oligopoly supply with multi-product firms competing in price and advertising
• Allow advertising to impact demand in a flexible way
• Allow past advertising to impact current demand meaning firms play a dynamic game
• Estimate the model on a typical junk food market (UK market for potato chips)
• Simulate the impact of advertising ban on equilibrium outcomes (prices, expenditures, quantities, nutrition)
• Consider the impact on welfare - including effects on health and on income
What effect does advertising have on consumers?

Advertising distorts consumers' attention from the unhealthy characteristics of their food choices. Willingness to pay for more healthy product:

<table>
<thead>
<tr>
<th>Advertising:</th>
<th>None</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food at home</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Willingness to pay in pence</td>
<td>5.3</td>
<td>3.5</td>
<td>0.6</td>
</tr>
<tr>
<td>[4.7, 5.8]</td>
<td>[3.0, 3.9]</td>
<td>[-0.4, 1.6]</td>
<td></td>
</tr>
<tr>
<td>% of mean price</td>
<td>2.5</td>
<td>1.7</td>
<td>0.3</td>
</tr>
<tr>
<td>[2.3, 2.8]</td>
<td>[1.5, 1.9]</td>
<td>[-0.2, 0.8]</td>
<td></td>
</tr>
<tr>
<td><strong>Food on-the-go</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Willingness to pay in pence</td>
<td>0.9</td>
<td>0.0</td>
<td>-0.8</td>
</tr>
<tr>
<td>[0.7, 1.1]</td>
<td>[-0.2, 0.1]</td>
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</tr>
<tr>
<td>% of mean price</td>
<td>1.7</td>
<td>-0.1</td>
<td>-1.5</td>
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<td>[-1.8, -1.0]</td>
<td></td>
</tr>
</tbody>
</table>

Median WTP in pence for a one point reduction in nutritional profile score, approximately a 10% increase in “healthiness”.

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Impact of a ban on advertising

- equilibrium effect
  - consumers choose healthier products (because advertising no longer distorts their choices)
  - at constant prices, quantity of potato chips purchased would decrease
  - but banning advertising leads to stronger price competition, which leads to lower prices
  - lower prices leads to an increase in quantity consumed and total calories but not significant changes in salt or saturated fat

- welfare effect
  - if advertising is viewed as distorting prices, total welfare would rise, consumers pay lower price and make undistorted choices
  - however, if advertising is something that consumer derive utility from, then welfare would decrease, because consumers no longer get this utility
Cash transfers

- Households from higher socioeconomic groups have better diets
  - would giving poor households money improve their diets?
  - i.e. does income have a causal effect on the quality of diet?

- To evaluate these questions we need to account for other confounding factors:
  - differences in demographics, e.g. education levels
  - differences in preferences
  - differences in prices face

- If it is due to income (i.e. if health food is a luxury good) then cash transfers could improve the diets of poorer households
In kind transfers

- Also called conditional cash transfers
- Give money but tie it to expenditure on a specific item
  - Childcare vouchers
  - US food stamps
  - Subsidies to education etc.
• Healthy Start Vouchers (HSV) were introduced in November 2006
• they are vouchers for fruit, vegetables or milk
• given to low-income families (families that are on benefits) with children under 4 years old and pregnant women
• around £3.00 per voucher per week
  • one voucher per child; two for children aged 0 - 1
  • vouchers sent monthly; valid only for that month
Free milk, fruit, veg and vitamins for you and your family

To apply please see the form inside www.healthystart.nhs.uk

HEALTHY START

DHSSPS NHS SCOTLAND healthier scotland NHS
• We ask two questions:

1. Did the introduction of Healthy Start Vouchers (HSV) lead to an increase in spending on fruit and vegetables for households the received them?
   - if we just compared expenditure of households who received HSVs on fruit and vegetables before and after the introduction of the scheme we might conflate the effect of the policy with other potentially confounding factors that changed over time
   - we compare the change in spending before and after the HSV scheme was introduced across eligible (the “treated”) and ineligible (the “control”) households
   - we use households who were on benefits but did not yet have children, or had children just over the age limit for HSV
   - (we also consider households that were just above the benefits threshold)

2. Were all households effected in the same way? Was the policy cost effective, or did it have a big deadweight loss?
What effect do we expect the change in economic incentives to have?

- Standard economic analysis suggests that vouchers will only be effective in changing behaviour of recipients who would otherwise spend less than the value of the voucher on the targeted good.
- For other households, who would already have spent more than the value of the voucher in the absence of the voucher, the effect will not differ from simply giving them the same amount of cash.
Summary

- The Healthy Start Vouchers increased expenditure on fruit and vegetables by households that received it, relative to households that did not.
- The impact was through standard economic incentives:
  - those households that were spending less than the value of the voucher before it was introduced increased their marginal propensity to consume fruit and vegetables by 23.2%.
  - those who were already spending more than the amount of the voucher before the vouchers were introduced did not change their behaviour.
Summary

- Policy concern
  - public health concern about obesity and the composition of diet

- Economic rationale for intervention
  - there may be externalities
  - consumers probably lack information, and more importantly the ability/willingness to process it
  - and firms might seek to exploit this

- Policy options
  - need to think clearly about aims of government intervention in order to effectively target policy
  - as well as considering consumer responses, it is important to consider the likely supply-side responses of firms
Policies to address weight and healthy diets

- Much work to do in understanding how different policies affect outcomes in the market
- Economists have a rich toolkit that combines economic theory, econometric methods and data to help provide some insights
- Work with psychologists and others can help understand the mechanisms at work

- in more recent work we’re considering
  - the factors that affect food preference formation in childhood, and lack of self-control
  - obesity arises from imbalance between calories from food and calories burned in activities, policy needs to target this balance, not just one side