

Cheap Donuts & Expensive Broccoli: The Effect of Relative Food Prices on Body Mass Index

Jonathan Klick

Florida State University College of Law
American Enterprise Institute

Thomas Stratmann

George Mason University

Why Have Americans Gotten Fatter?

- Induced Demand Explanations
 - Food advertising
 - Proliferation of fast food restaurants
 - Soda/Candy machines in schools
- Natural Explanations
 - Declining food prices
 - More sedentary work
 - More women in the workforce
 - Declining smoking rates

Price Theory Explanation

- Philipson & Posner/Lakdawalla & Philipson
 - As food prices decline in real terms, people eat more
- However, different foods have different effects on nutritional composition of diet
 - Has the price of healthful food evolved in the same way as the price of unhealthy foods

The Effect of Relative Prices

- Constrained optimization problem where individual chooses how much healthful food and unhealthy food to eat

$$\frac{\partial U / \partial \text{Healthful Food}}{\partial U / \partial \text{Unhealthy Food}} = \frac{\text{price}_{\text{Healthful}}}{\text{price}_{\text{Unhealthy}}}$$

⇒ As the price of healthful food increases relative to unhealthy food, people will eat relatively more unhealthy food (relatively less healthful food)

Figure 1:
Price of Selected Foods

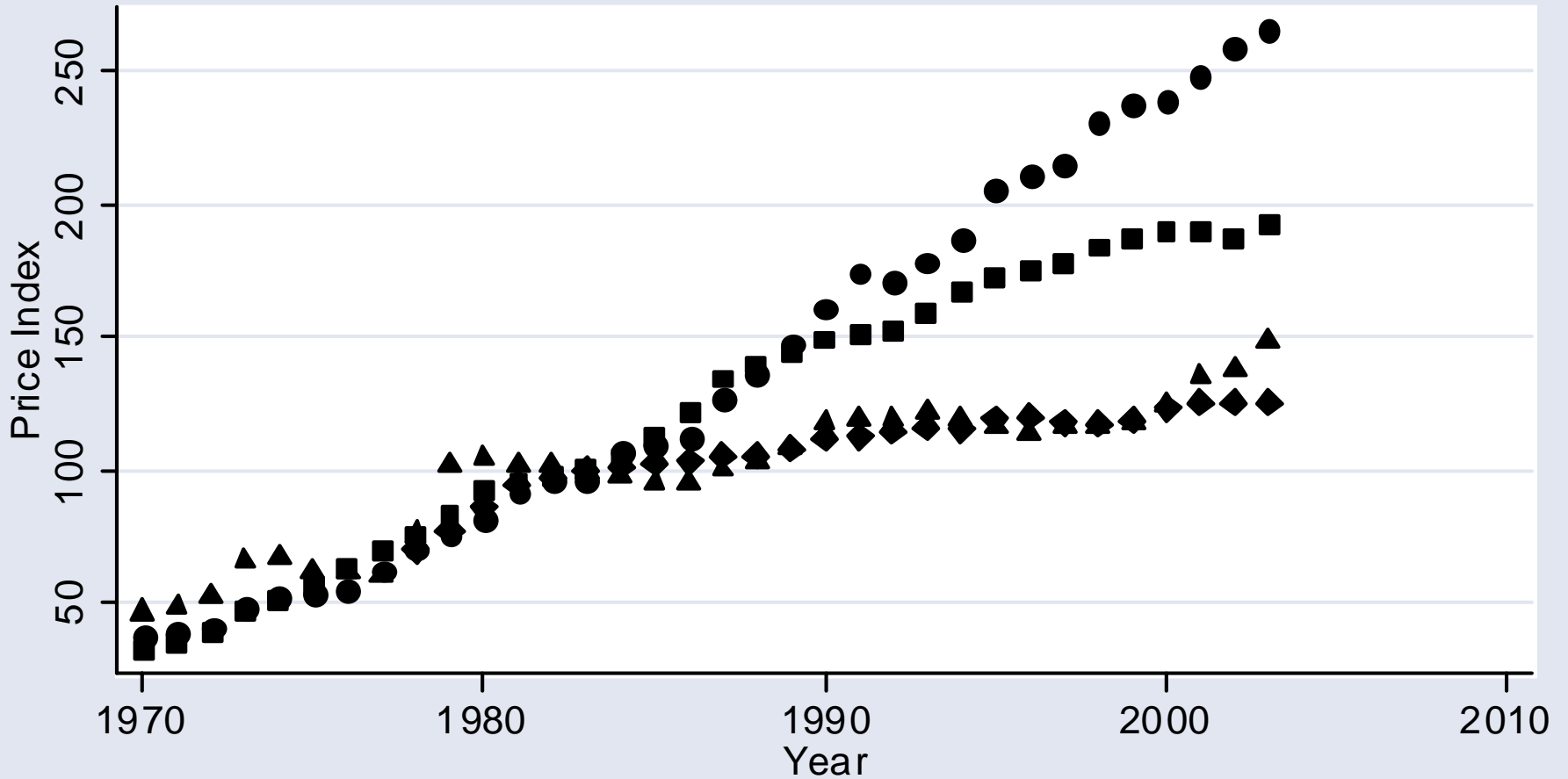
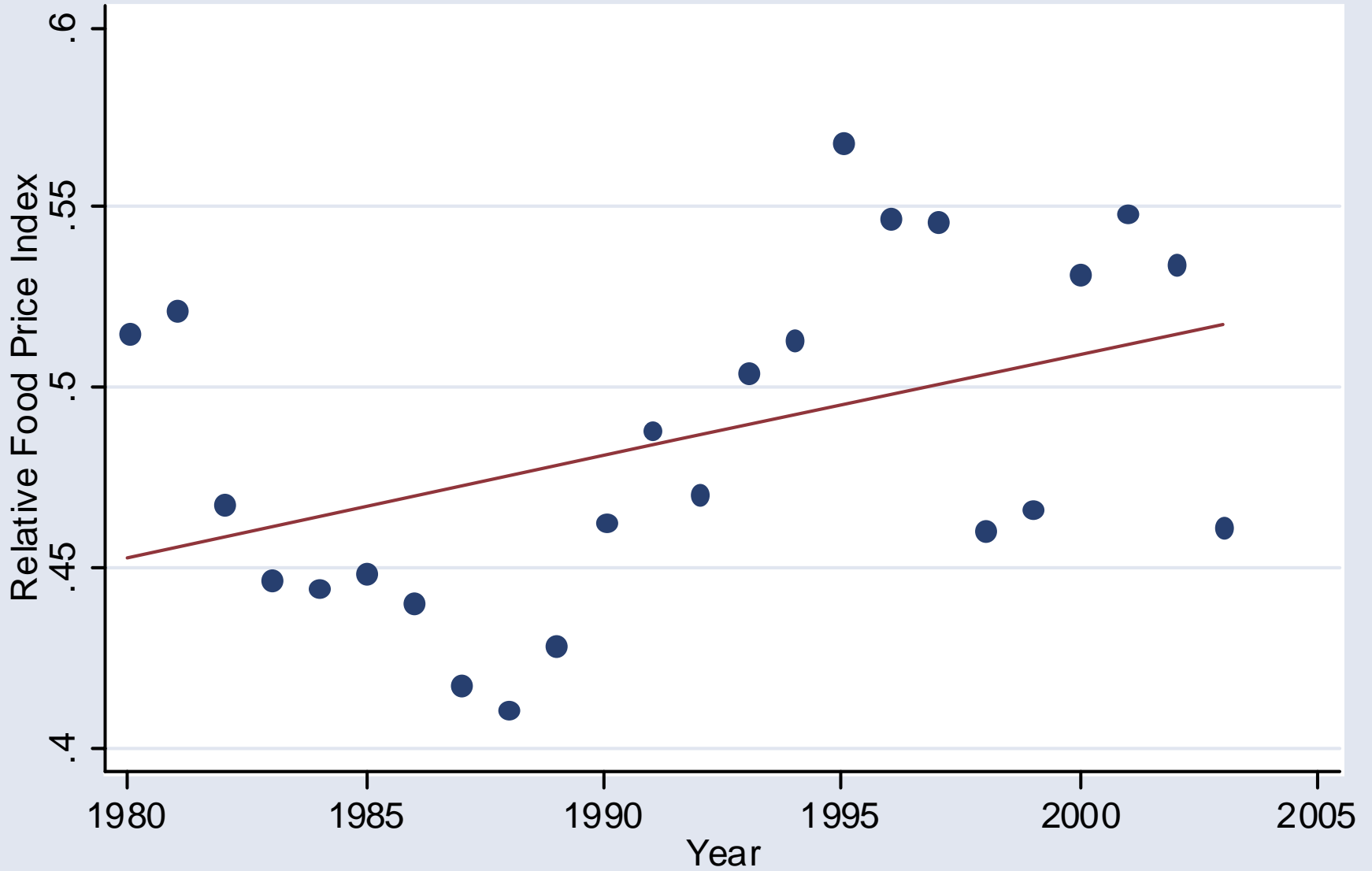


Figure 2:

Price Healthful/Price Unhealthful



Regression Results

- National Health Interview Survey (1980-2000) Data
- Price Data Aggregated at Census Region Level
- Controls: Age(+), Age²(-), Income(+), Income²(-), Education(-), Male(+), Race, Region, Regional Trends
- Effect of Relative Prices (Healthful/Unhealthful) is Positive and Statistically Significant at 1% Level

=> Result implies an elasticity between BMI and relative price index of 0.02

Does Sensitivity to Relative Prices Vary by Race?

- Some indication in the public health literature that minority individuals are especially at risk of being overweight/obese
- Also, some public health studies suggest that the underlying causes of being overweight differ by race
- Re-estimate regressions with separate white and black relative price sensitivity coefficients

=>Both coefficients are positive and statistically significant at 1 percent level; Black coefficient is 80% larger, implying that black individuals are more sensitive to relative prices than white individuals are

Explanations?: Discount rates, income differences, health literacy?

Public Policy Responses

- If obesity is seen as a public (as opposed to a private) health issue, fat taxes or health food subsidies might positively influence behavior
- Effect of these taxes/subsidies might be greater for black individuals
- For both races, it would seem that the marginal effect of fat taxes would be larger than the marginal effect of health food subsidies (especially for black individuals)
- Results appear to be robust to other datasets (BRFSS) and additional controls (smoking, marital status, etc.)