

The Unequal Gains from Entry at the Top: Estimating the Whole Foods effect

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Outline

Introduction

Data and empirical strategy

Results

Competition at the top

- ▶ In general, more competition is predicted to:
 - ▶ Decrease prices
 - ▶ Increase quality/quantity
 - ▶ Increase consumer welfare
 - ▶ Make profits fall
- ▶ What about competition for high-end products?
 - ▶ Same inside the high-end submarket
 - ▶ Trickle-down hypothesis [AFG 2018](#)
 - ▶ Theoretically ambiguous result
- ▶ In a context of rising inequality...
 - ▶ Increasing incentive to compete in high-end markets [Jaravel 2018](#)
 - ▶ What happens to the 99%?

Setting

- ▶ Rise of the organic segment of the food retail industry
- ▶ Market where growth is fundamentally limited ▶ GDP
- ▶ Traditional channels to increase profits: differentiation upwards (packaging, transformation) or discount “value”
- ▶ More recently: “better-for-you”: “health” and “natural”, high quality and expensive products.
- ▶ The USDA organic label: a marker of quality
 - ▶ Guarantees producer has followed precise processes avoiding most pesticides, etc.
 - ▶ Does not guarantee products are pesticide-free.
 - ▶ Much more expensive.
 - ▶ A perfect vertical dimension of quality?
- ▶ A segment that is growing twice as fast as the rest of the sector ▶ OTA

Research question

- ▶ Does the development of the organic segment have a pro-competitive effect on the high-end segment of the food retail market? (Probably yes)
- ▶ Does it have a pro-competitive effect on the low-end segment (trickle down) or has it exacerbated inequalities?
- ▶ What mechanisms account for this?
 1. Cost of switching suppliers
 2. Crowd out of the high-quality ingredients

Research design & Preview

Event-study on entry of Whole Foods in a neighborhood

1. ...on incumbents' prices and variety
2. ...on residents' consumption basket
3. ...on the nutritional quality of goods offered by incumbents

Later: structural estimation on the costs of providing quality?

Trade-off distance/quality?

Literature review

- ▶ Search cost models: more firms reduce consumers' incentive to search, so each firm can increase price [Stiglitz 1987](#)
- ▶ Differentiation models
 - ▶ Market share effect vs price sensitivity effect [Chen and Riordan 2008](#)
 - ▶ Horizontal: new entrants provide different, valued, characteristics
 - ▶ Both prices and consumer welfare may go up [Perloff, Suslow and Seguin 1995](#)
- ▶ Trade models
 - ▶ Wal-Mart in Mexico pushed incumbents' prices down while catering to rich customers [Atkin et al. 2018](#)
 - ▶ Innovation in high-end consumer goods did not result in much good for low-income households on aggregate [Jaravel 2018](#)

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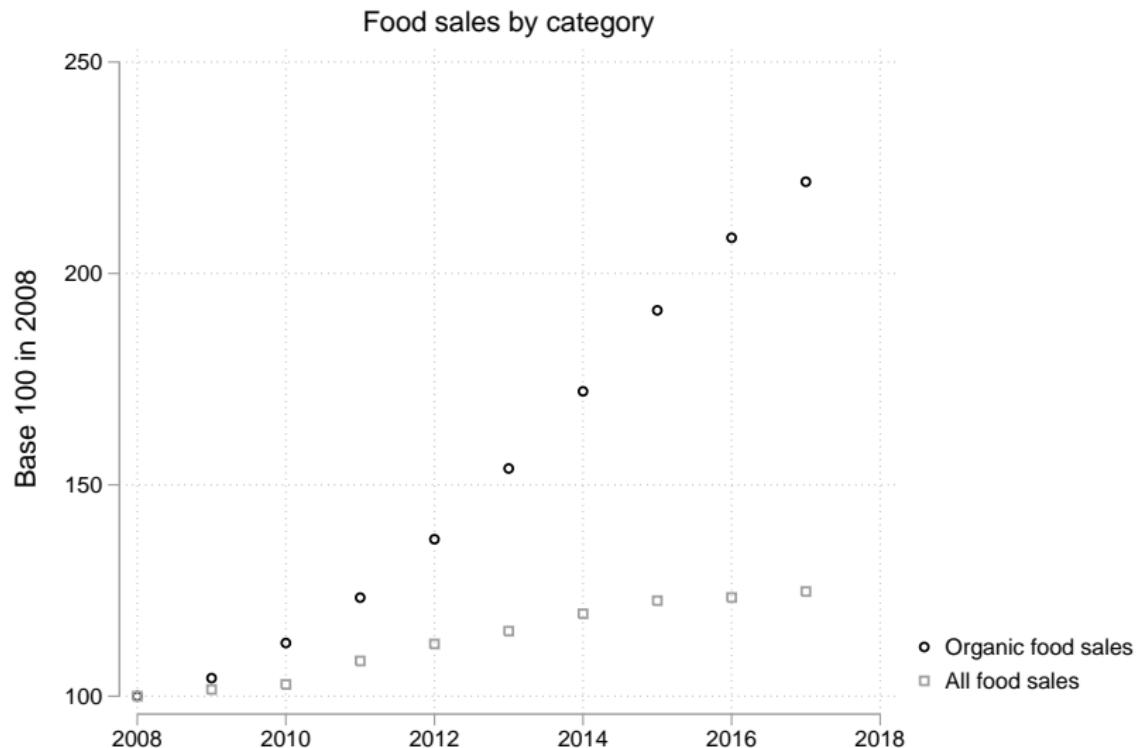
Results

Data

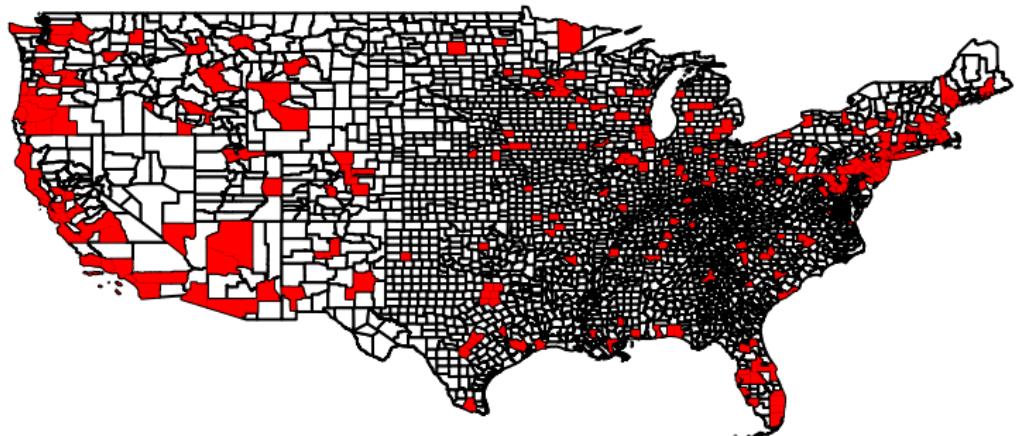
- ▶ Nielsen's scanner data
 - ▶ Weekly prices and volume sold at the barcode level
 - ▶ 35,000 stores from 90 different chains, including half the sales volumes of US "grocery and drug stores", 2006-2016
- ▶ Nielsen's homescan panel data
 - ▶ For each shopping trip, prices and volume bought at the barcode level
 - ▶ 40,000-60,000 panelists per year, 2004-2016
- ▶ Specialized organic stores: I focus on Whole Foods (added 200 stores between 2008 and 2017, almost doubling it). Retrieve exact location, entry and announcement dates from ProQuest
- ▶ Nutrition/health data from USDA

Approach

More than 80% of households “reported purchasing organic on a regular basis in 2016” (Organic Trade Association)

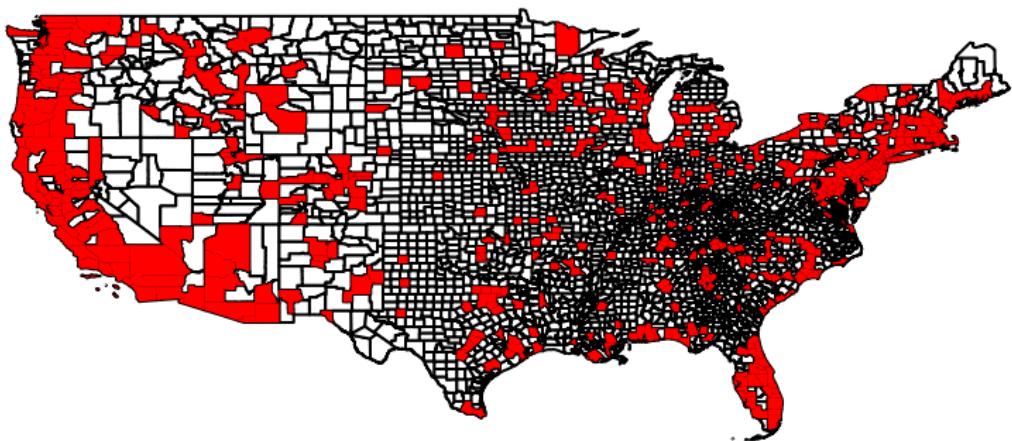


Presence of specialized organic stores by county in 2006



Source: ReferenceUSA

Presence of specialized organic stores by county in 2016



Source: ReferenceUSA

Empirical strategy - geographic

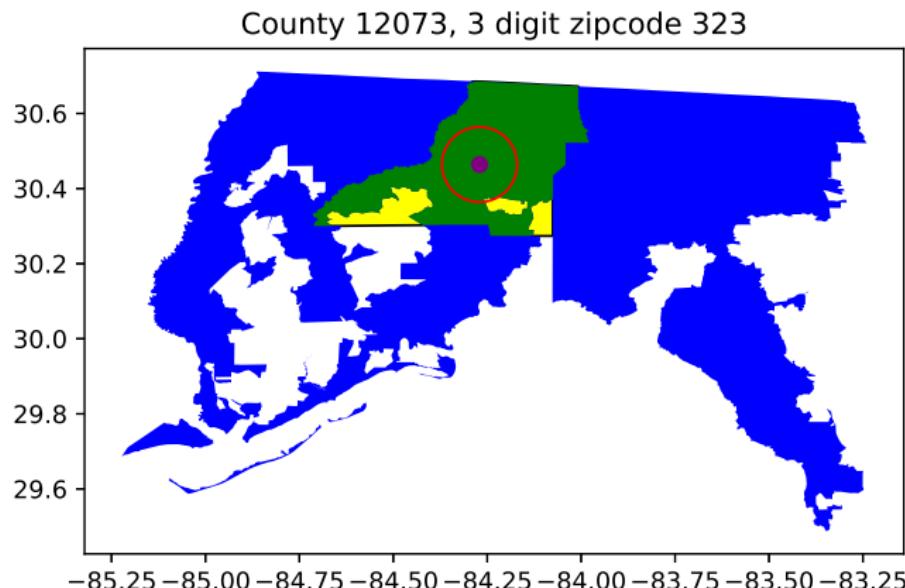


Figure: Tallahassee, FL. In blue the 3-digit zipcode area 323, in yellow the county Leon 12073, in green the area that matches both.

Empirical strategy - temporal

- ▶ 200 stores opening over 10 years
- ▶ Natural setting for staggered DiD [Meckel 2015](#)
- ▶ ... Need pre trends to be parallel for areas with entry and areas without entry
- ▶ Which is not the case
- ▶ Focus on event study
 - ▶ Need pre trend to be flat

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Regressions

1. Barcode-by-store level

$$\ln p_{bgsm} = \sum_{j=-13}^{36} \beta_j \mathbb{I}(\text{Months Since Entry}_{mt} = j) + \delta_{gsbm} + \eta_t + \epsilon_{gsbmt}$$

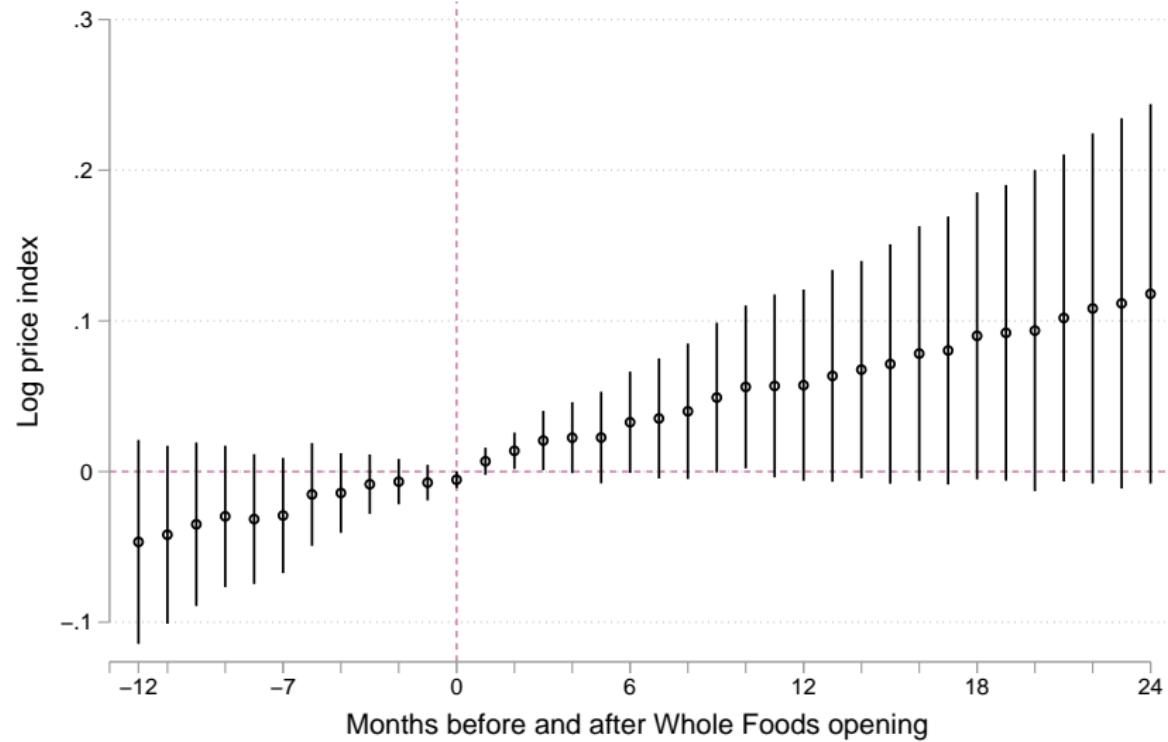
where $\ln p_{bgsm}$ is the log price of a barcode-product b in product group g, individual store s, in market m and month t.

2. Store level

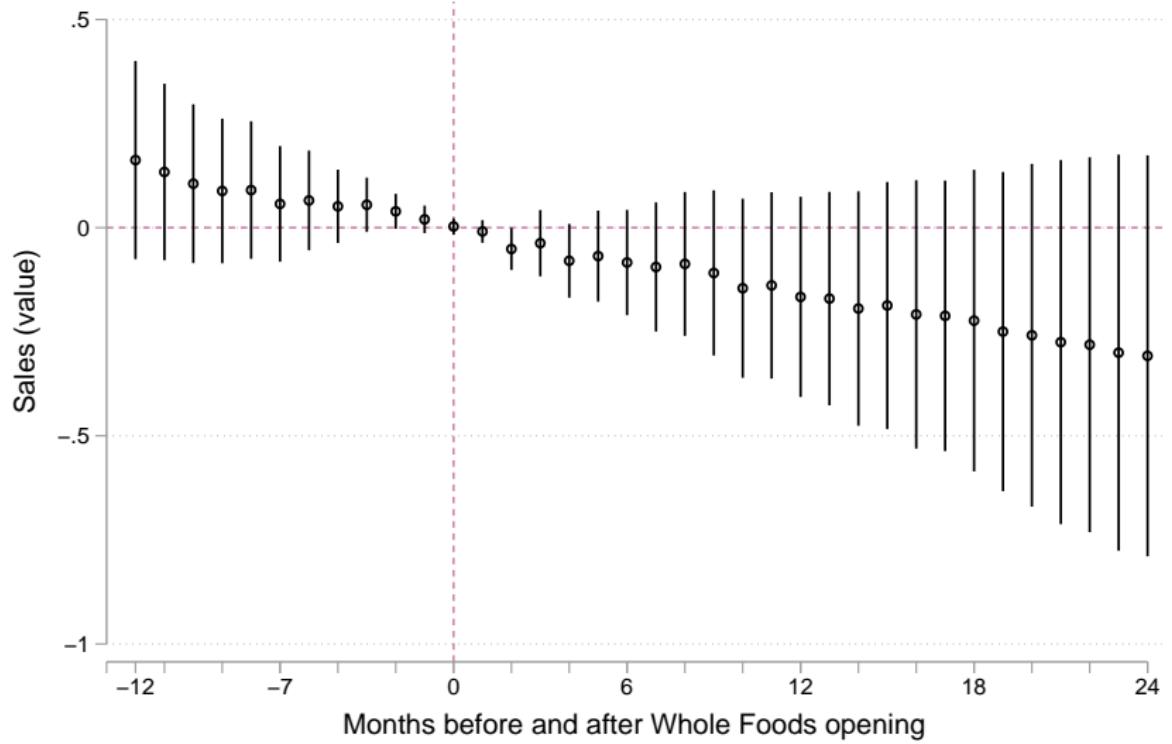
$$y_{smt} = \sum_{j=-13}^{36} \beta_j \mathbb{I}(\text{Months Since Entry}_{mt} = j) + \delta_{sm} + \eta_t + \epsilon_{smt}$$

Cluster Standard Errors at the market level (affected by the Whole Foods shock)

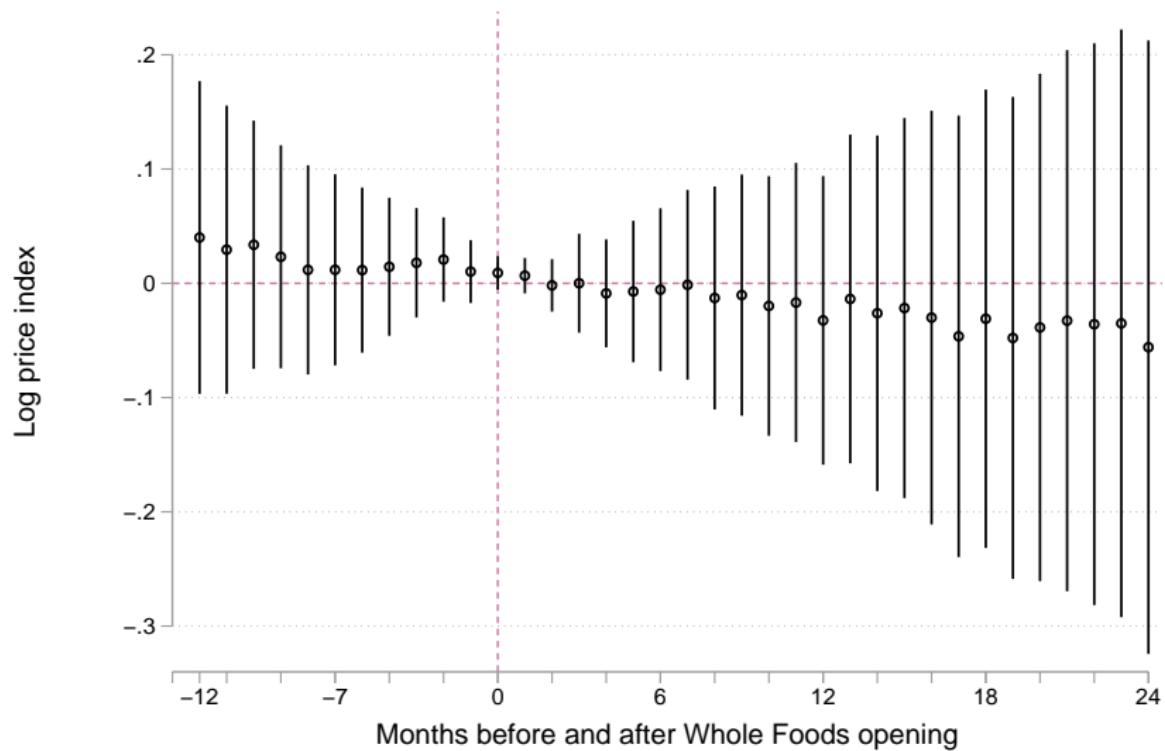
Event study on log barcode price



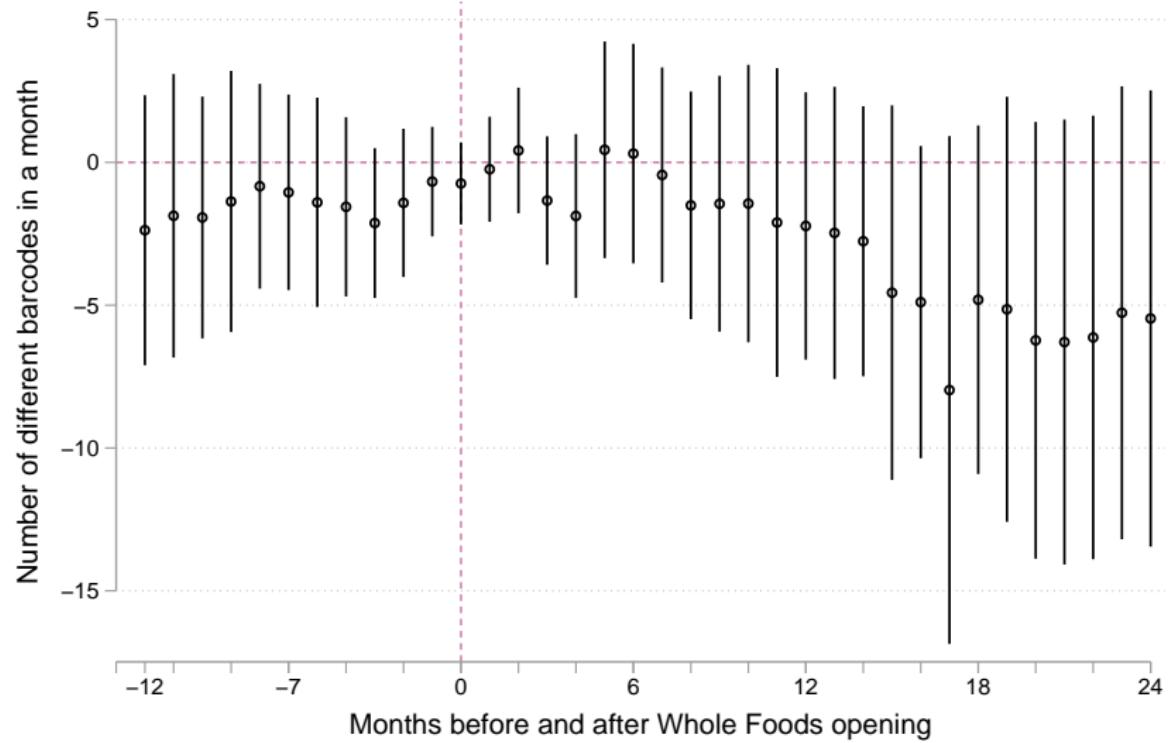
Event study on log sales (value)



Event study on log price index



Event study on variety



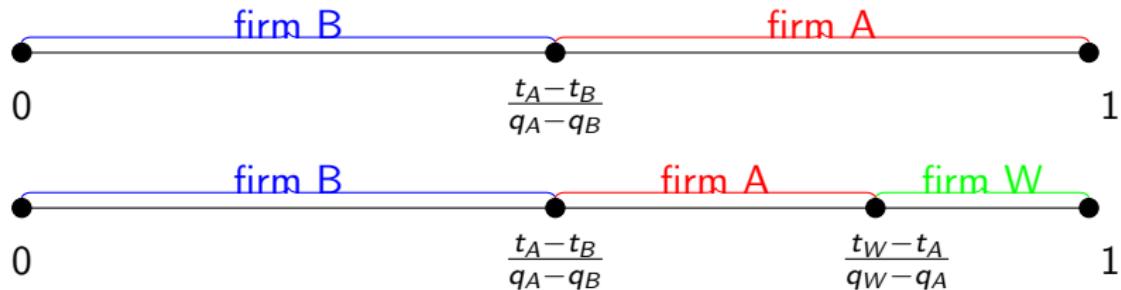
Model sketch

- ▶ Oligopolistic competition with horizontal (location) and vertical (organic or not) differentiation.
- ▶ Firms: sequential game
 1. They decide whether to enter or not
 2. If they enter they choose a product, characterized by a vertical dimension q (0 or 1) and a horizontal dimension h at fixed cost $F(q)$ and variable cost $c(q)$.
 3. They compete in prices
- ▶ Consumers: they are characterized by a location α and an income Y . Utility from consuming product (q, h) for price p is described by

$$U(q, d, y) \text{ Where } d = |h - \alpha|, y = Y - p$$

Preview of results

- ▶ Abstracting for location
- ▶ Going from two firms (q_A, q_B) to three (q_A, q_B, q_W) with $q_W > q_Q > q_B$

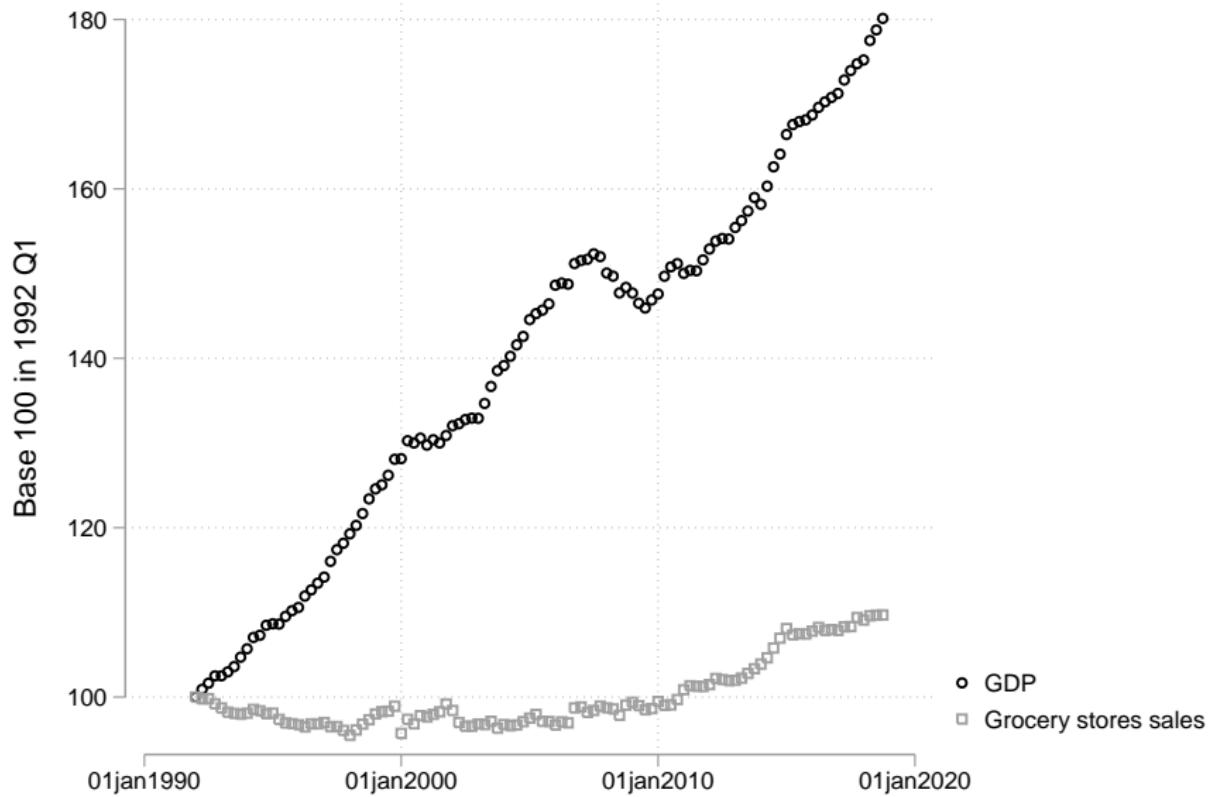


- ▶ High-income consumers always benefit from entry by switching
- ▶ For the rest, ambiguous. May end up with a quality-price bundle that they enjoy less.

Conclusion

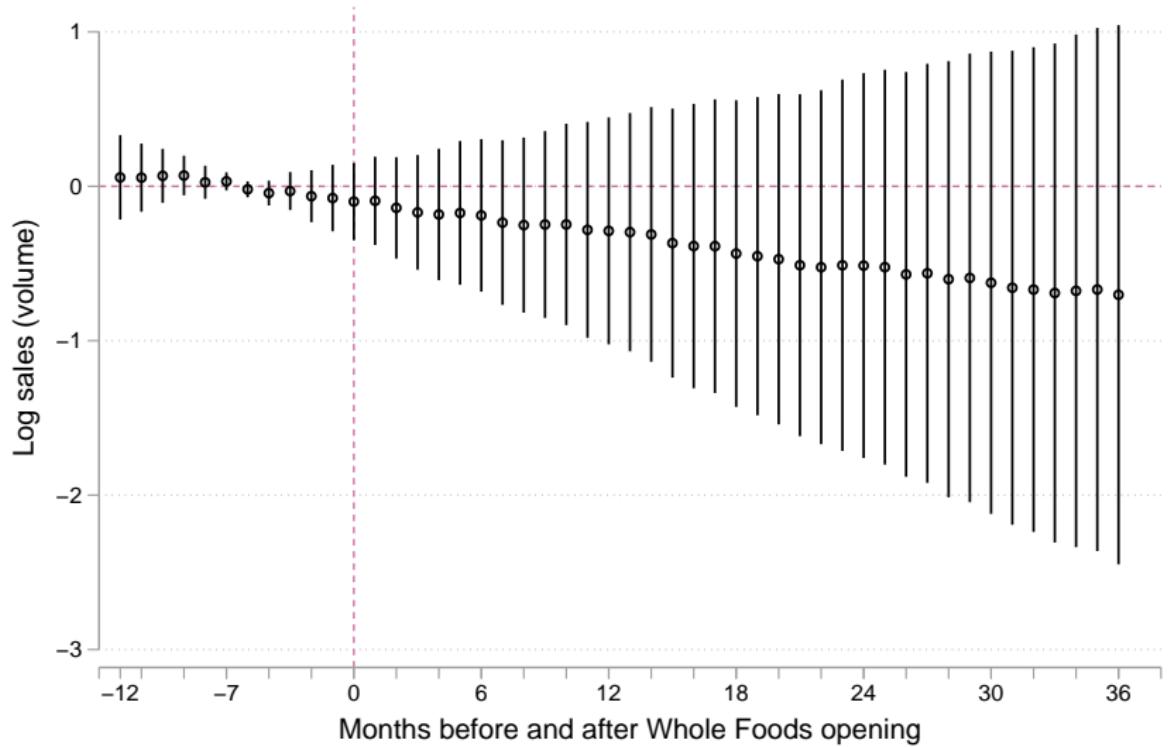
- ▶ Work in progress
- ▶ Initial evidence that the increase in competition at the top might not benefit the lower-income households
 1. 2.5% barcode-price increase on top of inflation 2 years after
 2. No effect on average price, decrease in variety (store quality)
- ▶ Next steps: extend the reduced-form analysis beyond produce and frozen departments, for more Whole Foods store (more organic stores)
- ▶ Merge with nutrition data to look at quality at product level
- ▶ And elaborate on model.

GDP vs grocery store sales in real terms, 1992-2018



Source: FRED St Louis Fed

Event study on log sales (volume)



▶ Back

Food sales by category

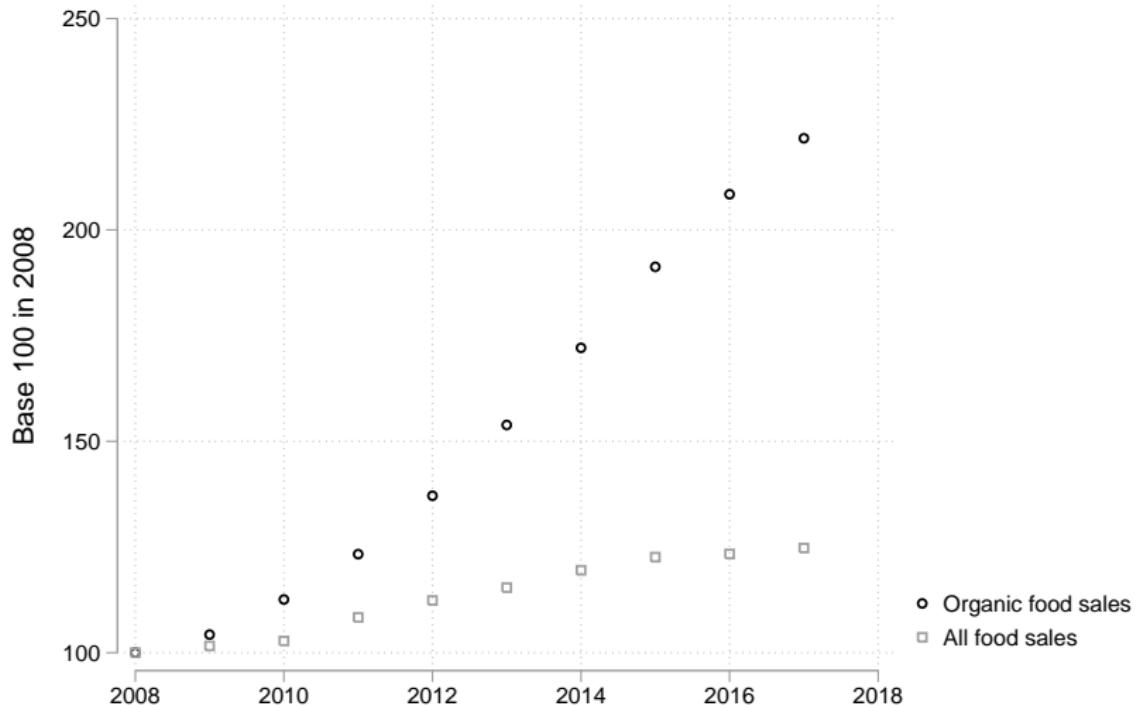


Figure: Evolution of food sales for organic and all food, source: Organic Trade Association