The Evolution of U.S. Retail Concentration

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Motivation

Changes in the aggregate structure of retail

- Increasing national concentration (Autor, Dorn, Katz, Patterson, Van Reenan 2020;Hortascu and Syverson 2015)
- Growth of Walmart, Target, etc.
- Exit of small firms (Basker 2005; Jia 2008; Foster, Haltiwanger, Klimek, Krizan, Ohlmacher 2016)
- Effect on consumers? (Market Power, Markups, Costs)

Retail markets are local

- Negative effects of concentration operate through local markets
- What does the increase in national concentration imply for local markets?

This Paper – 3 Results

1. Decomposition of national HHI into local HHI and cross-market HHI
   - What does the increase in national concentration imply for local markets?
   - HHI is a probability

Result: National and local concentration measure **different concepts** (in U.S.)

- National: Consumers in different markets (98% cross market HHI)
- Local: Consumers in the same market

Contribution: Relationship between national and local concentration

- Measurement, Anti-trust
- Expansion of national firms (Cao, Hyatt, Mukoyama, Saeger 2020; Rossi-Hansberg and Hsieh 2019)

This Paper – 3 Results

2. Measure local retail concentration with Census data
   - Concentration for product markets
   - Multi-product retailers

Result: Local concentration increases steadily for 30 years
- Widespread increases in local concentration

Contribution: Measure local retail sales concentration with Census data
- Rossi-Hansberg, Sarte, Trachter 2020; Benkard, Yurucoglu, Zhang 2021; Rinz 2021

This Paper – 3 Results

3. What does increasing local concentration mean for consumers?
   - Off-the-shelf model linking markups and local HHI (Atkeson & Burstein, 2008)
   - Key: Higher concentration => Higher Markups => Lower passthrough of cost savings

Result:

- Markups increase by 2pp between 1992-2012 (1/3 of increase in markups in ARTS)
- Increases are small relative to drop in retail prices

Contribution:

- Potential explanation for increase in markups (Bornstein 2018; Brand 2020)

Store-level sales data

- Census of Retail Trade (CRT)
  - **All** (employer) retail stores
  - 1982-2012 – Years ending in 2 and 7

- Location: **Commuting Zone**, MSA, Zip, County
  - National e-commerce share
- Industry: NAICS
- Sales by 20 product categories (clothing, groceries, etc.)

Definition of markets – Industry vs Product

Measuring Concentration

Herfindahl-Hirschman Index (for a market)

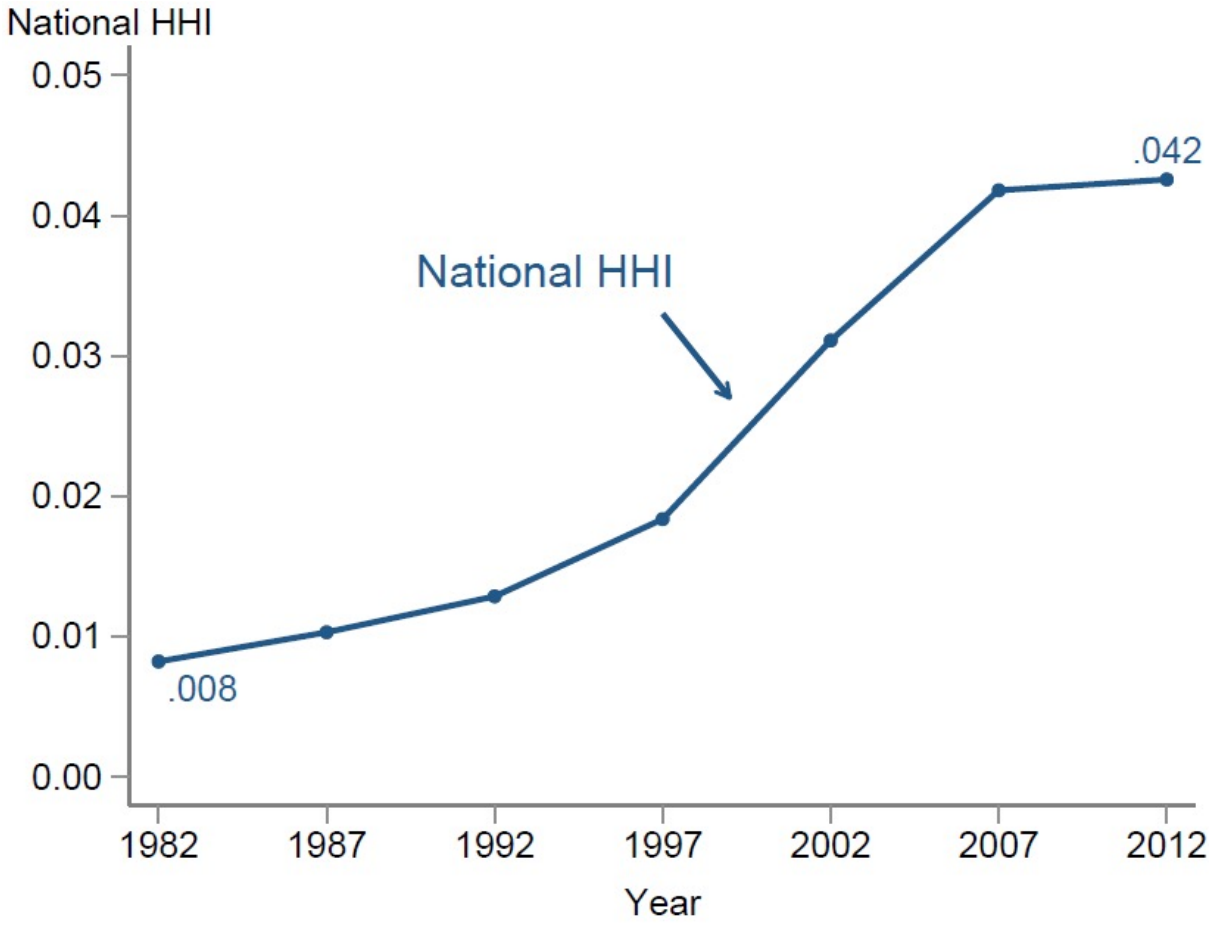
$$HHI^m = \sum_{i=1}^{N} (s_i^m)^2 \qquad s_i^m: \text{ Sales share of } \mathbf{firm}\ i \text{ in } m$$

What does the HHI mean?

- Probability two random dollars (x, y) are spent at the same firm (i)

$$HHI = P(i_x = i_y)$$

National U.S. retail concentration increasing



- Average across products
- Big increase between 97-07
- Probability increase
  - 1/100 to 1/20

Result 1: Decomposition of National Concentration

What does national concentration imply about local?

Relationship between National and Local HHI

Goal: $HHI^N = P(i_x = i_y) = f(HHI^L, \epsilon)$

Relationship between National and Local HHI

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Law of Total Probability

Condition on dollars spent in the same market ($m_x = m_y$)

$$HHI^N = P(m_x = m_y)\boldsymbol{P(i_x = i_y | m_x = m_y)} + \Big(1 - P(m_x = m_y)\Big)\boldsymbol{P(i_x = i_y | m_x \neq m_y)}$$

Relationship between National and Local HHI

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Avg Local HHI

Avg Cross Market HHI

Relationship between National and Local HHI

Goal: $HHI^N = P(i_x = i_y) = f(HHI^L, \epsilon)$

Law of Total Probability

Condition on dollars spent in the same market ($m_x = m_y$)

$$HHI^N = \underbrace{P(m_x = m_y)}_{\text{Collocation (<2\% for commuting zones)}}\boldsymbol{P(i_x = i_y | m_x = m_y)} + \Big(1 - P(m_x = m_y)\Big)\boldsymbol{P(i_x = i_y | m_x \neq m_y)}$$

(Larger in other countries)

Relationship between National and Local HHI

Law of Total Probability

Condition on dollars spent in the same market ($m_x = m_y$)

$$HHI^N = 0.02\boldsymbol{P}(\boldsymbol{i_x = i_y}|\boldsymbol{m_x = m_y}) + 0.98\boldsymbol{P}(\boldsymbol{i_x = i_y}|\boldsymbol{m_x \neq m_y})$$

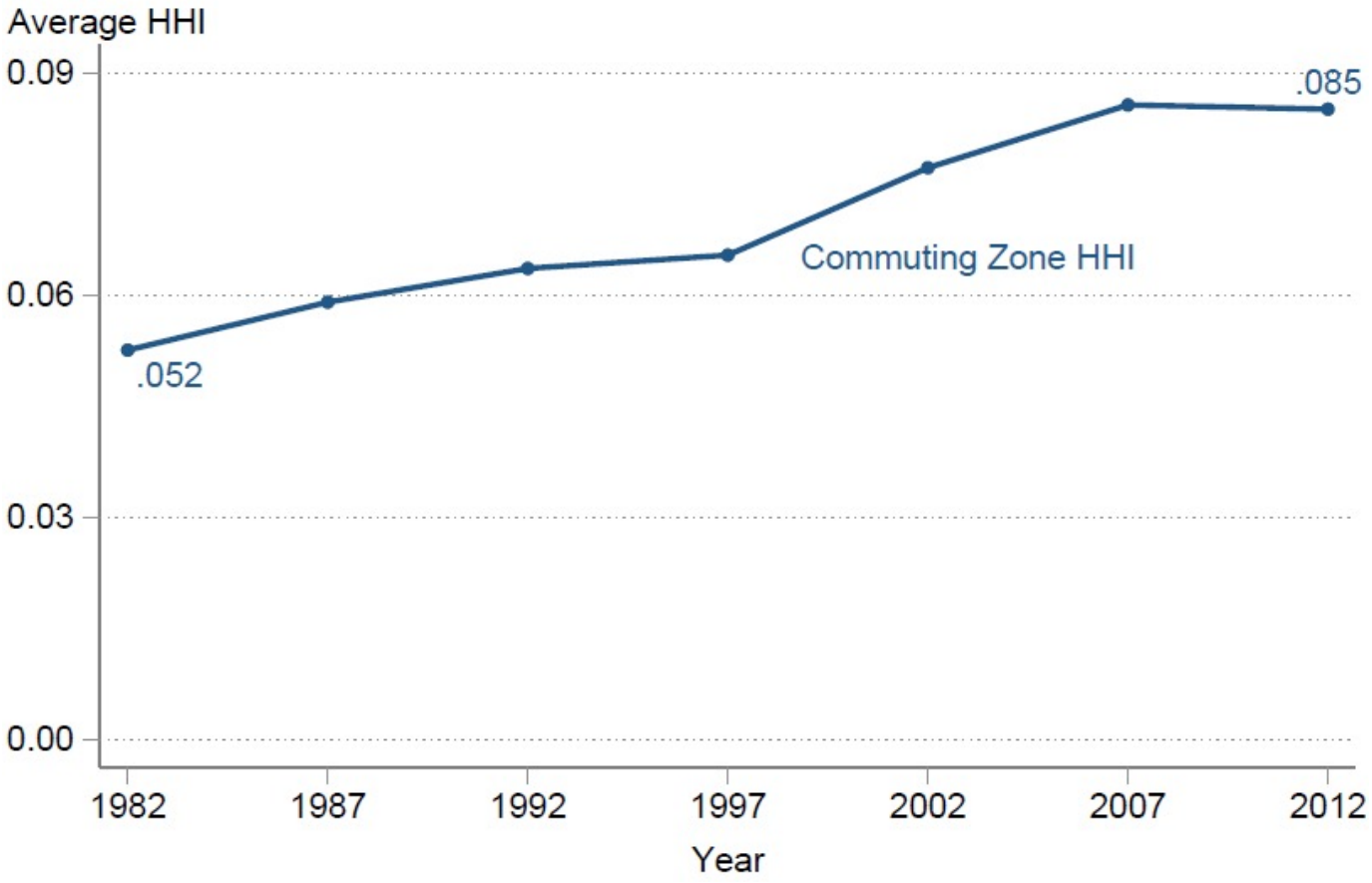
Increases in national HHI reflect increases in cross market HHI!

- Consumers in different markets shop at the same firm

Can condition on many other things

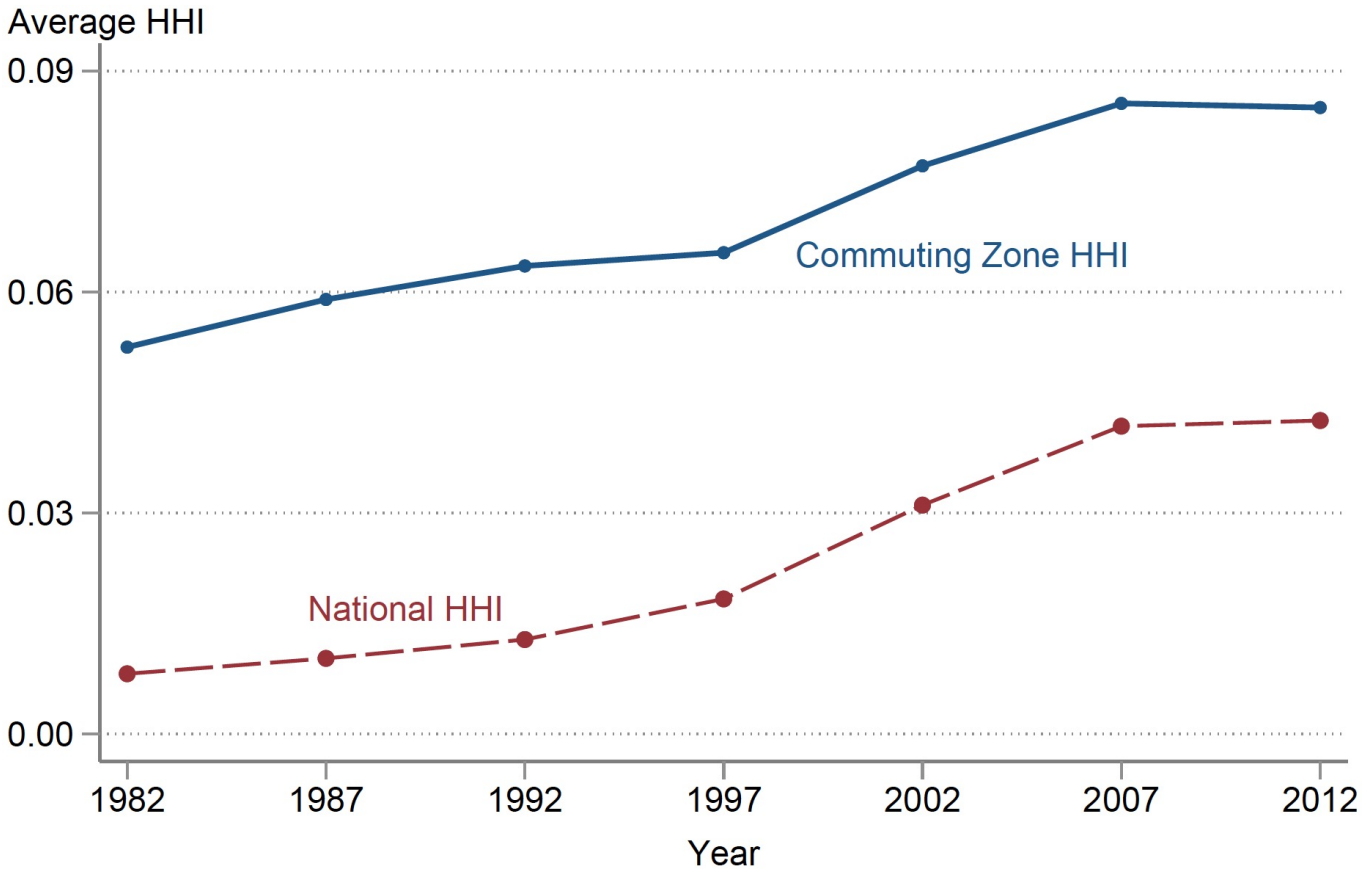
Result 2: Measurement of Local Concentration

Local Concentration Increases



- Steadily increasing
- 3pp increase
- Other geographies similar

Both Local and National HHI Increase



- Contain different info
- Steady vs sharp increase

Additional Results (In Paper)

1. Concentration changes across products
   - Almost all products increase (clothing)
2. Changes across location
   - Majority of locations increase concentration
3. Effect of e-commerce
   - Bounds on effect size (small)
4. Industry changes larger
   - GM local HHI increased 28pp

What are the consequences of these changes?

- Are the local HHI increases big?
- Market power and markups?
- Consumer Welfare

Key Question:

- Effect of concentration on passthrough of lower costs

Result 3: Effect of Local HHI on Markups

Model of Firms' Markups

Atkenson & Burnstein (2008) model of oligopolistic competition

- **Market:** product-location pair
  - J products in L locations
  - $I(j, \ell)$ firms compete in quantities (Cournot) in a market
- **Demand:** Product demand is CES (ε_j)
- **Pricing:** Market specific prices ($p_i^{j\ell}$)
- **Technology:** Firms vary in market-specific marginal cost ($\lambda_i^{j\ell}$)

Key Equation: HHI to Markups

$$p_i^{j\ell} = \mu_i^{j\ell} \lambda_i^{j\ell} \qquad \mu_i^{j\ell} = \frac{\varepsilon_j}{(\varepsilon_j - 1)(1 - s_i^{j\ell})}$$

Markup $\mu_i^{j\ell}$ depends on firm *i*'s sales share in product-market ($s_i^{j\ell}$):

- Higher share ⟶ Higher markup
- Higher share ⟶ Lower prices, higher productivity

Key: Equation linking product level HHI and markups

$$\mu_j = \frac{\varepsilon_j}{\varepsilon_j - 1}\left[1 - HHI_j\right]^{-1}$$

Exercise

How much did the increase in local HHI increase (average) markups?

- Markups from Annual Retail Trade Survey in 1993 (first year)
  - Estimate elasticities with 1992 local HHI
- Change local HHI from 1992 to 2012 values

Result:

- Markups increase 2pp
- 1/3 of observed increase in ARTS (Sales / COGS)
- Industry: Markups increase 24pp

Conclusion

- HHI is a probability
- National trends are not informative about local concentration
- Both local and national concentration rising in retail
  - 98% of national is cross market
- Higher local concentration increased markups 2pp (1992-2012)