Diverging Trends in National and Local Concentration

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NBER Macro Annual, 2020
Introduction

- Recent literature has documented increasing national product-market concentration, driven by growing top firms
  - CEA, Gutierrez and Philippon (2017), Barkai (2017), among others
- Consistent narrative has emerged whereby the rise in national concentration is the cause for
  - Rising markups and market power (De Loecker and Eeckhout, 2017)
  - Increasing profits (Barkai, 2017)
  - Declining labor share (Autor, et al., 2017)
  - Declining firm entry and dynamism (Decker, et al., 2017)
- However, most markets are local and product-specific
  - Due to transport costs and imperfect substitutability
  - Concentration is more appropriately measured locally and for fine product classifications
- We use NETS data from 1990-2014 to explore national and local product-market concentration trends
Four Main Facts

We document four main facts relating to product-market concentration between 1990 and 2014:

1. Overall and for all major sectors, concentration is increasing nationally but decreasing locally
2. 8-digit industries with diverging trends are pervasive and account for a large share of employment and sales
3. Among diverging industries, top firms have increased national but decreased local concentration
4. Among diverging industries, opening of a plant from a top firm is associated with a long-lasting decrease in local concentration

Facts remain when looking at labor markets instead of product markets.
The Data

- Data comes from the National Establishment Time Series (NETS)
  - Provided by Walls & Associates from Dun & Bradstreet
- Contains annual observations of every U.S. business establishment from 1990 through 2014
  - Sales, employment, owning enterprise, primary industry, and location
  - Each establishment is assigned a unique ID number allowing us to track it over time even in case of corporate-level changes
  - Data on primary industry is provided at 8-digit SIC code level or more aggregate sectors
- We exclude establishments associated with
  - Agriculture, education, government, mining, and non-profits
  - Barnatchez, Crane and Decker (2017) find large discrepancies in these sectors
- Unique feature: NETS allows us to circumnavigate confidentiality restrictions in census data, and allows us to perform unique analysis
Data Quality

- Potential concerns in NETS
  1. Discrepancies in employment relative to CBP
     - In our sample of sectors, employment trends very similar in NETS and CBP
     - In our sample of sectors, very high correlation between employment at county and zipcode between NETS and CBP at every year
  2. Trend in coverage of firms
     - No trend in the time series of the correlation of employment between NETS and CBP
  3. Extended coverage of small firms
     - All results robust to excluding very small firms
     - All results weighted by employment

- Conclude that characteristics of NETS, with its minor differences with Census data, are not responsible for our results
Measuring Concentration

- Our benchmark measure of concentration is the Herfindahl-Hirschman Index (HHI),
  \[ C_{i,g,t} = \sum_{e} s_{e,i,g,t}^2 \in \left[1/N, 1\right]\]

  where \( s_{e,i,g,t} \) is an enterprise \( e \)'s total share of sales in industry \( i \) (SIC 8), location \( g \), at time \( t \) and \( N \) is the number of enterprises

  - Four geography levels for \( g \): country, CBSA, county, ZIP code
  - Results are robust to alternative measures of concentration (e.g. adjusted HHI or share of top enterprise)

- Other used measures of concentration can be problematic
  - for narrowly defined products, only a few local markets have more than 4 firms (\(< 10\%\))
  - Analysis in Ganapati (2018) is faulty
Measuring Concentration Trends

- Differences across industries in market structure make aggregation in levels cumbersome
  - Calculate changes in the HHI for each \((i, g, t)\) pair from the first year with observed sales for that \((i, g)\) pair, \(\Delta C_{i,g,t}\) (similar to adding a fixed-effect to the cell)

- Calculate for each year the average change, weighted by employment \((w_{i,g,t})\), across all industries,
  \[
  \Delta C_t = \sum_{i,g} w_{i,g,t} \Delta C_{i,g,t}
  \]

  - We compute it for the whole economy and by major sector
  - We compute it for each level of geography
Fact 1: Diverging National and Local Concentration Trends

HHI of sales: ZIP and SIC levels
HHI of employment: ZIP and SIC levels
HHI of sales: Balanced panel

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Fact 1: Diverging National and Local Concentration Trends

HHI of sales: Balanced panel
Positive and Negative Trends

- We want to assess the relative importance of national and negative trends.
- For each industry we compute the weighed average change in HHI, 

\[ \Delta C_{i,t} = \sum_g w_{i,g,t} \Delta C_{i,g,t} \]

- To calculate sign of trend for each SIC 8 industry we regress \( \Delta C_{i,t} \) on \( t \) and determine the sign of the coefficient.
- Fraction of employment:
  - 61% in industries with *positive national* trend
  - 78% in industries with *negative local* (ZIP) coefficients
  - 43% in industries with both *positive national but negative local* (ZIP) coefficients
Fact 2: Pervasive Diverging Trends Across 2-digit Sectors

- Diverging trends are most prevalent in Retail Trade, least prevalent in Manufacturing
Measuring the Role of Top Firms

- We want to understand the role of top firms in generating diverging trends
  - Define an industries’ top firm(s) using national 2014 sales
- Calculate trends in concentration with and without the top firm
  - Look at \((i, g)\) pairs where top firm enters
  - Select \((i, g, t)\) where concentration can be calculated after excluding top firm
- Are top firms expanding (and increasing national concentration) by adding establishments that decrease local concentration?
Fact 3: The Role of Top Firms in Diverging Industries

Role of top 3 firms
Role of top 2 and 3
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Average Change in HHI from First Year

Year

Including Top Enterprise
Excluding Top Enterprise

ZIP Level
National Level
### Fact 3: The Role of Top Firms in Concentrating Industries

<table>
<thead>
<tr>
<th>Year</th>
<th>ZIP Level</th>
<th>National Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>-0.1</td>
<td>-0.1</td>
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<tr>
<td>1995</td>
<td>-0.05</td>
<td>-0.05</td>
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<td>2010</td>
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<tr>
<td>2014</td>
<td>0.15</td>
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</tbody>
</table>

The Role of Top 3 Firms

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Diverging Trends in Concentration

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Are top firms actually lowering concentration when they enter a locality?
  ▶ How long-lasting is the effect?

We want to measure the effect on local concentration before and after a top firm enters an \((i,g)\) pair
  ▶ Calculate for every industry and location and average using employment shares
  ▶ Use 10 year window (3 before and 7 after) and normalize by HHI in year of entry
Fact 4: Local Entry of Top Firm, Diverging Industries

Average Change in HHI from First Year

Years Since SIC 8's Top Enterprise Opening in ZIP Code

Including Top Enterprise

Excluding Top Enterprise
Fact 4: Local Entry of Top Firm, Concentrating Industries

The diagram illustrates the average change in HHI from the first year, showing the impact of a top firm's entry on concentration over years since SIC 8's top enterprise opened in a ZIP code. The graph compares the average change in HHI including and excluding the top enterprise.

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The Case of Walmart

- Fact 4 presents average across industries, here we look at one specific industry
  - Advantage is that effect of local entry on number of establishments easier to interpret
- Study Discount Department Stores industry (SIC 8 53119901)
  - Walmart’s primary industry and where Walmart is the top firm
  - Industry exhibits diverging trends
  - Event study works well, there is no apparent trend in concentration if we exclude sales of entering Walmart establishments

The case of Cemex
Concentration when Walmart Comes to Town

The case of Cemex

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Number of Firms when Walmart Comes to Town

The case of Cemex

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Diverging Trends in Concentration

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Can We Link Local Concentration With Market Power?

- Our findings are robust: there is a fall in local measures of product markets concentration
- Standard, single market, theories of market competition imply that the fall in concentration must come with an increase in competition
- ...but theories of multimarket competition sometimes imply the opposite
  - if large firms are expanding to the same markets, then it could be easier to collude. Thus, a decrease in competition
    - (Bernheim and Whinston 1990, Bond and Syropoulos 2008)
- So, do we see declines in local concentration due to entry of several top firms to the same markets?
Employment share of markets with top firm where also 2nd and/or 3rd firms are present went from 6% to 10%
Conclusions

- Rising national concentration is largely driven by expansion of large firms into new local markets
  - This expansion makes local markets less concentrated and, probably, more competitive
- Findings help reconcile observations of increasing national concentration but more mixed findings on markups and profits
- Results also hold for employment. Also robust to alternative ways to sample the data and concentration measures
- In sum, product-market concentration does not seem to be a problem, anti-trust authorities can take a pause
  - In fact, Carl Shapiro (former top anti-trust official) has been hypothesizing our findings
  - Of course, large national firms might be problematic for other reasons: political capture, monopsony power, etc.
### Comparison with CBP - Standardized Employment

The following table and graph illustrate the standardized employment trends across different years, starting from 1990, and excluding NETS Enterprises with various employee counts.

<table>
<thead>
<tr>
<th>Year</th>
<th>Incl. All NETS Enterprises</th>
<th>Excl. 1 Employee</th>
<th>Excl. &lt;5 Employees</th>
<th>Excl. &lt;10 Employees</th>
<th>CBP</th>
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<tbody>
<tr>
<td>1990</td>
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<td>2015</td>
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**Data quality**
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## Comparison with CBP - County-Level Correlations

<table>
<thead>
<tr>
<th>Year</th>
<th>Correlation Coefficient</th>
<th>Including All NETS Enterprises</th>
<th>Excluding NETS Enterprises with 1 Employee</th>
<th>Excluding NETS Enterprises with Fewer than 5 Employees</th>
<th>Excluding NETS Enterprises with Fewer than 10 Employees</th>
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</thead>
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<td>1.0</td>
<td>1.0</td>
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<td>1995</td>
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<td>2000</td>
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<td>2010</td>
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<tr>
<td>2015</td>
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</table>

**Data quality**: Rossi-Hansberg, Sarte, and Trachter (2020) - Diverging Trends in Concentration

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Comparison with CBP - ZIP Code-Level Correlations

Data quality

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Diverging Trends in Concentration

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Role of Top 3 Firms, Diverging Industries

![Graph showing the average change in HHI from the first year for ZIP and National Levels including and excluding Top 3 Enterprises from 1990 to 2014. The graph illustrates diverging trends in concentration with a decrease in concentration over time for ZIP Level and an increase for National Level after 2000.]
Role of Top 3 Firms, Concentrating Industries

![Graph showing the average change in HHI from the first year for different levels and years.](image)

**Including Top 3 Enterprises**
- **ZIP Level**
- **National Level**

**Excluding Top 3 Enterprises**

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### Number of Establishments and Top Firm Local Entry

<table>
<thead>
<tr>
<th>Years Since SIC 8's Top Enterprise Opening in ZIP Code</th>
<th>Including Top Enterprise</th>
<th>Excluding Top Enterprise</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>SIC 8s with Positive ZIP Trend</td>
<td>SIC 8s with Negative ZIP Trend</td>
</tr>
<tr>
<td>-2</td>
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<td>7</td>
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</table>

**Effect on concentration**

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Fact 1

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Fact 1

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Fact 1

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Diverging Trends in Concentration

Diverging Trends with a Balanced Panel
Diverging Trends with a Balanced Panel

Fact 1
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The Role of the 2nd and 3rd Firm in Diverging Industries

Role in concentrating industries  Role of top firm
### The Role of 2nd and 3rd Firms in Concentrating Industries

Rossi-Hansberg, Sarte, and Trachter (2020) examine the role of 2nd and 3rd ranked enterprises in concentrating industries. The diagram illustrates the average change in HHI from the first year at ZIP and national levels, comparing including and excluding 2nd and 3rd ranked enterprises.

<table>
<thead>
<tr>
<th>Year</th>
<th>ZIP Level</th>
<th>National Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
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<tr>
<td>1995</td>
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</tr>
<tr>
<td>2014</td>
<td>0.2</td>
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</tr>
</tbody>
</table>

### Role in concentrating industries

- **Incl. 2nd & 3rd Ranked Enterprises**
- **Excl. 2nd & 3rd Ranked Enterprises**
The Case of Cemex

- While diverging trends are most prevalent in Retail Trade, FIRE, and Services, they also exist in manufacturing.
- Study Ready-Mixed Concrete industry (SIC 8 32730000)
  - Industry exhibits diverging trends
  - High transport costs in this industry make local measures of concentration more relevant (Syverson 2004; Syverson 2008).
  - Industry’s largest enterprise is Cemex, a Mexican building materials company
  - Event study works similarly to case of Walmart
Concentration when Cemex Comes to Town

The case of Walmart

Diverging Trends in Concentration

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The case of Walmart

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