How Wide Is the Firm Border?

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A Fundamental Question

These benefits are almost always motivated intuitively and qualitatively

Little explicit quantification

Reason: Measurement of these benefits is inherently difficult

- Shadow values dominate
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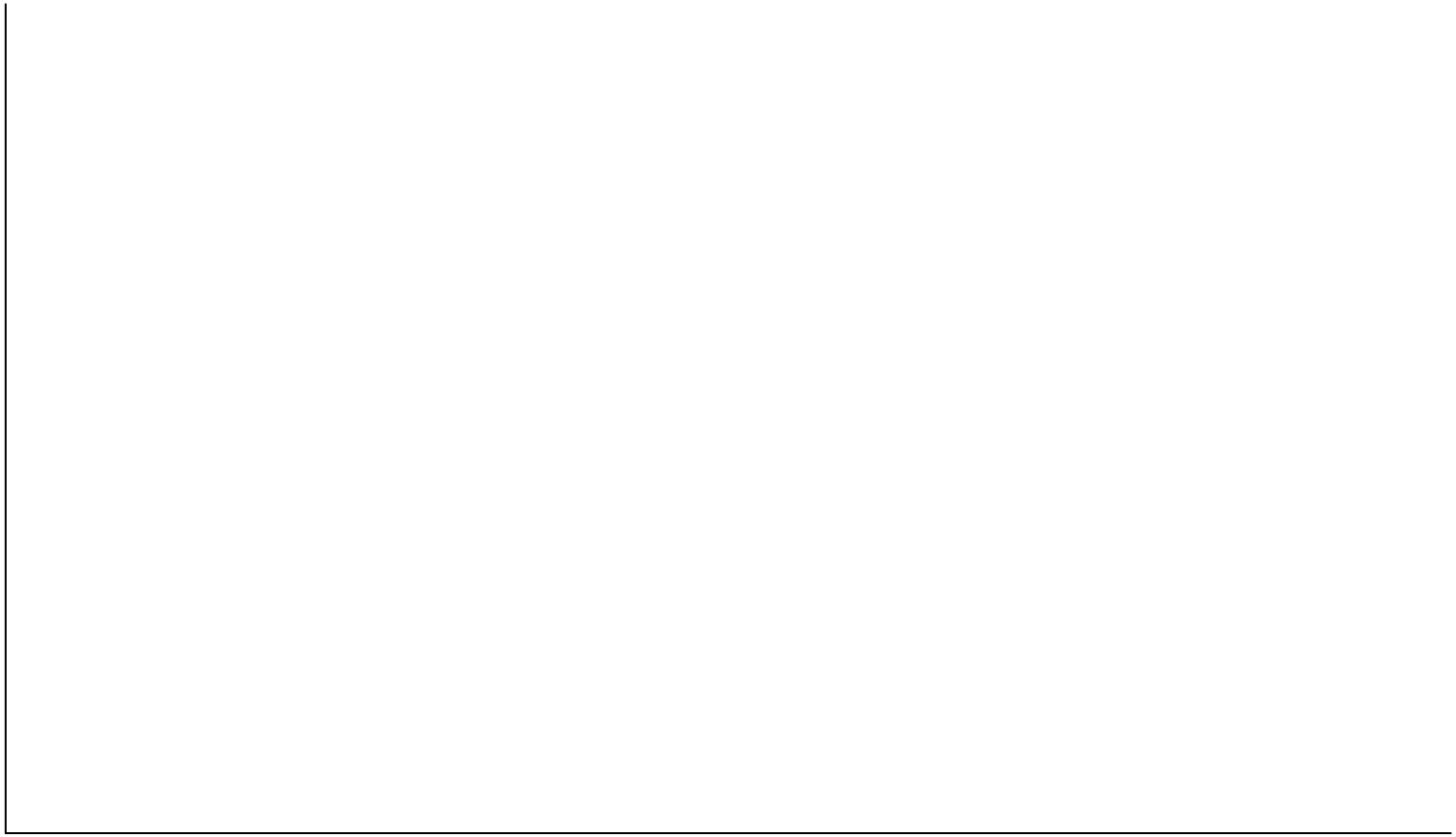
Our Approach

We offer a new approach to measure what makes a firm a firm

Our Approach: Illustration

Volume of shipments



Summary of Results

On average, ownership related to same boost in shipments as a 30-40% reduction in distance to the downstream recipient

- Median shipment distance in sample is 250 miles

Ownership boost stronger for:

- More distant shipments
- High value-to-weight products
- Producers in less capital-intensive industries
- Goods makers rather than pure shippers (e.g., warehouses)
- Differentiated products

Empirical Specification

We use an augmented gravity model

- Derived from primitives using our modified version of Eaton, Kortum, and Sotelo (2012)
- Allows for zeroes (by far the most common observation in our data)

$$\frac{\quad}{\quad} = \exp\{\quad \ln(\qquad\qquad) + \qquad + \qquad \ln(\qquad\qquad) + \qquad + \quad\}$$

Empirical Specification

$$\frac{\quad}{\quad} = \exp\{\quad \ln(\qquad\qquad) + \qquad\qquad + \qquad\qquad \ln(\qquad\qquad) + \qquad + \quad\}$$

Expected share of shipments originating at establishment i^e located in zip code z^e ending up in zip code z is a function of:

- Distance from i^e to z
- s_{zi^e}, (expenditure-weighted) share of downstream establishments in z that are owned by the firm that owns i^e
- Their interaction
- Origin and destination fixed effects

Implemented as FE Poisson model. Two-sided FEs are computationally impractical; we instead keep origin establishment FEs while controlling for destination-specific “multilateral resistance” terms

Data: U.S. Commodity Flow Survey

Random sample of establishments and their shipments in 2007

Covers goods-producing (mining, manufacturing, publishing) and goods-distributing (wholesale) sectors

Shipments sampled in one week of each quarter

Total coverage is 58,000 establishments and 4.3 million shipments

- Origin and destination ZIP, distance, dollar value, weight, & more
- Critically, also: owning-firm ID
  - We link comTd (1-27.275 -1.22 .11n1 Tf -25.91n02 T7v)-1(hi)-2(i
)-1(m)8(nt)-2ggruarti, wpod5(m)3(o)-14Tc 0 Tw 3.025 0 Td ( )Tj EMC 8/P <<

Results: Summary Stats

Sample:

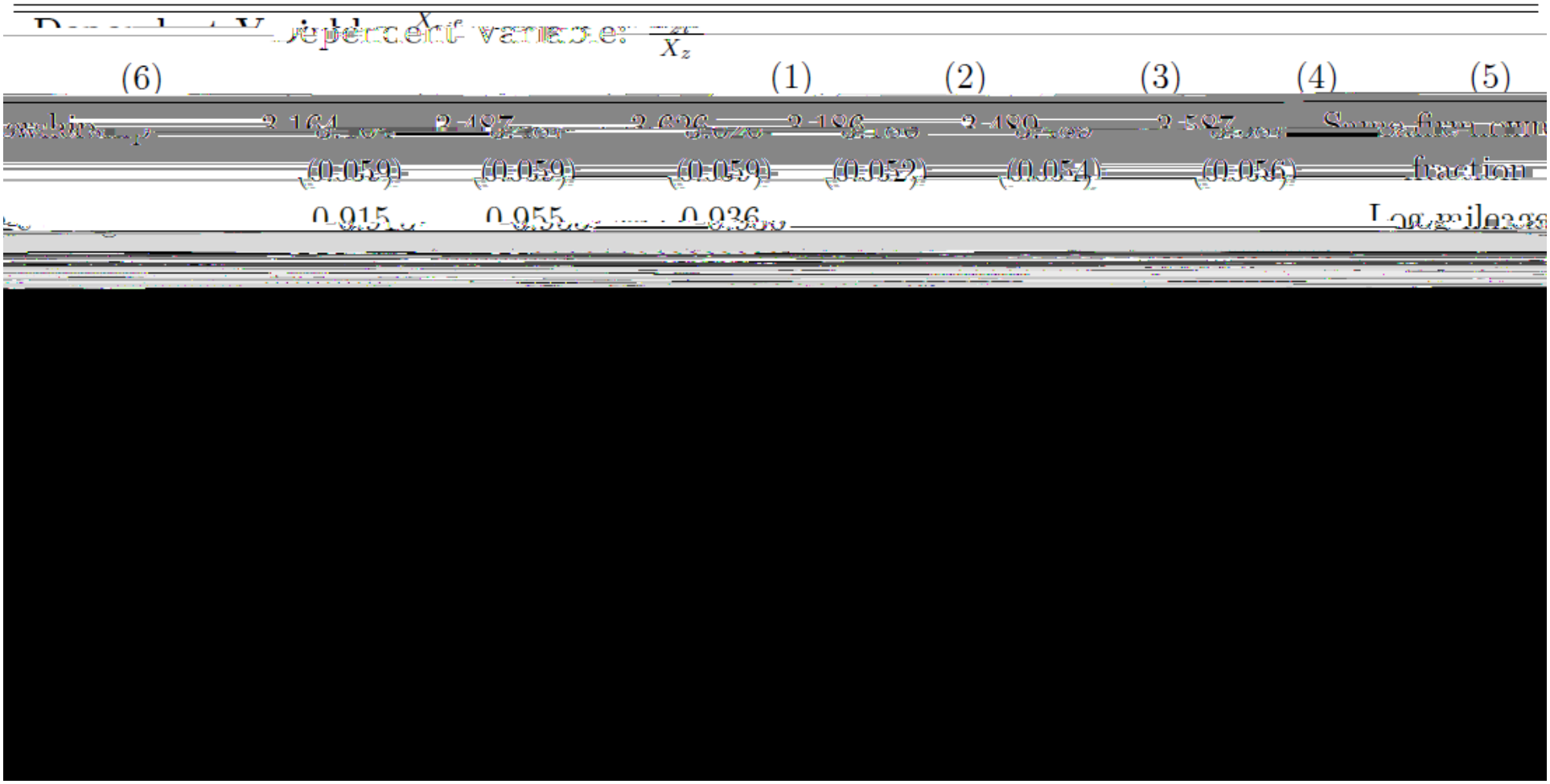
- 174 million i^e-z pairs
- 3.5 million shipments
- 34,800 shipping establishments

On average six times as many downstream establishments in i^e's firm in destination zips where i^e ships than zips where it does not

- Still, not many overall; mean number of downstream establishments to i^e across zip codes is about 30, but only 1% are owned.

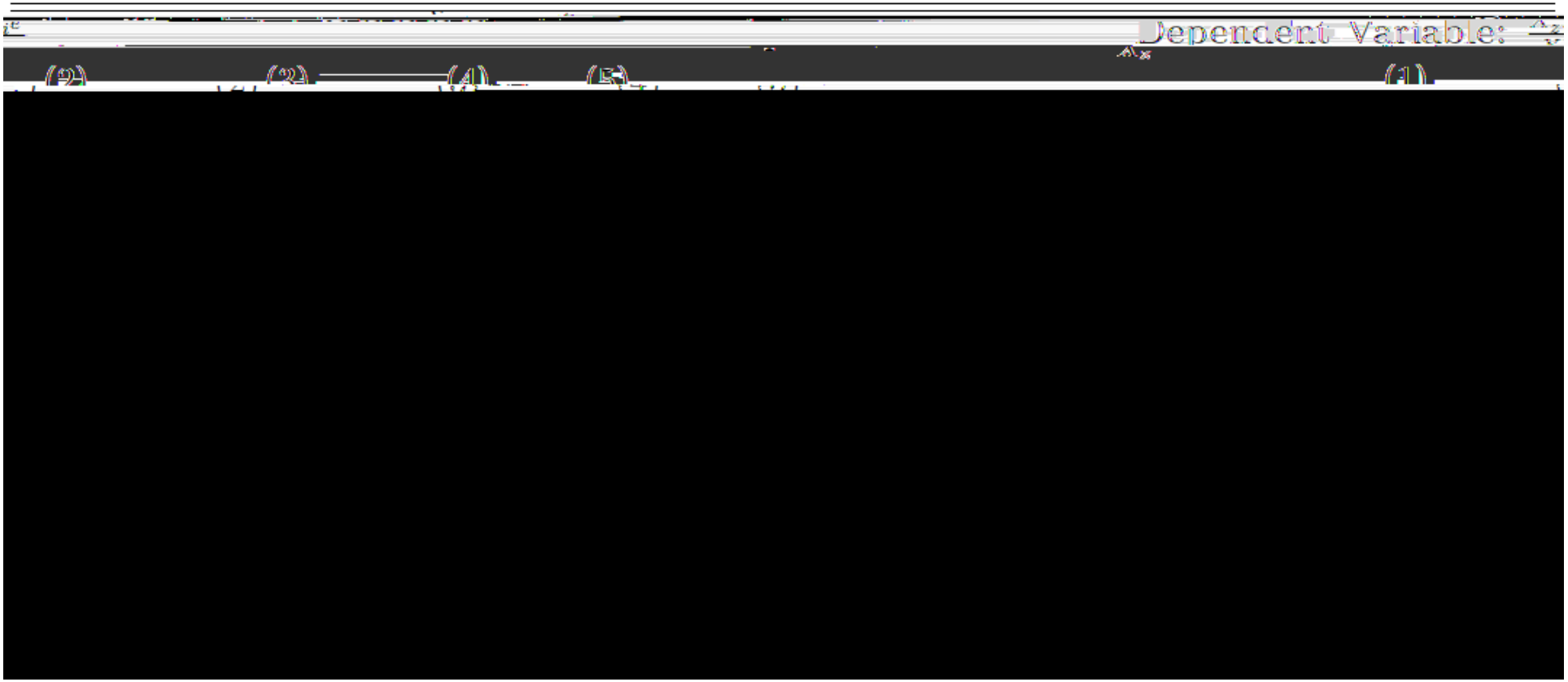
Owned downstream establishments located closer than non-owned

Results: Main Specifications



Coeffs imply adding same-firm downstream establishment to a zip increases shipment share the same amount as a 40% drop in distance

Results: Main Specifications



Interaction implies adding same-firm downstream establishment to zips at 10^{th}, 50^{th}, and 90^{th} percentile distances increases shipments by same amounts as declines in distance of (respectively) 39%, 44%, and 46%

Results: Heterogeneity

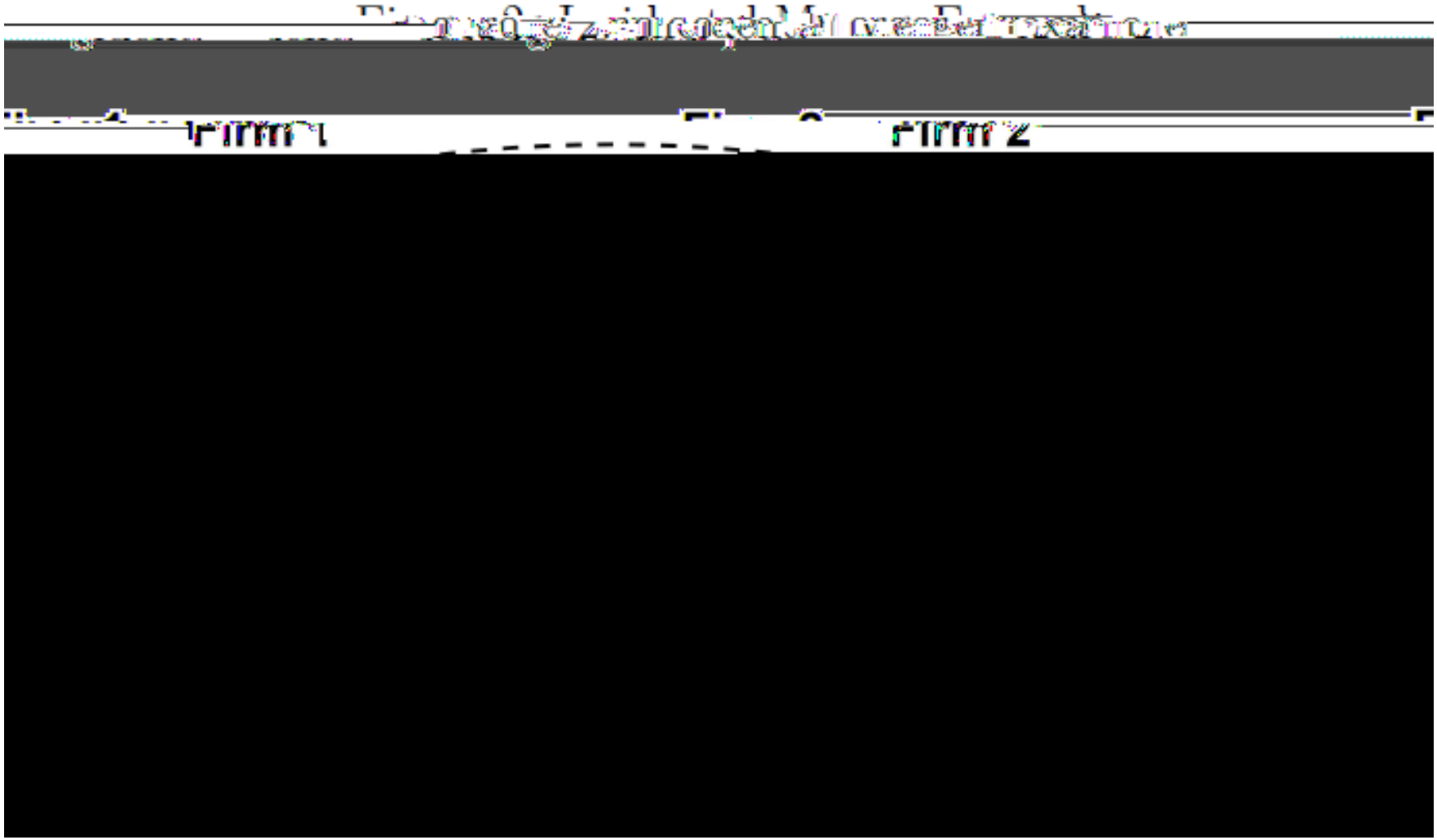
We interact ownership with industry- or commodity-level characteristics

- "Distance premium" of establishments shipping commodities with above-median value-to-weight ratios is 55%; below median is 35%
- Establishments in industries below median K/L have a distance premium of 55%; those above median 45%
- Establishments that are wholesalers have a distance premium of 35%; other industries have 48%
- Establishments producing "differentiated" (Rauch, 1999) commodities have a 52% distance premium, those making reference-priced commodities 38%, those in exchange markets have 45%

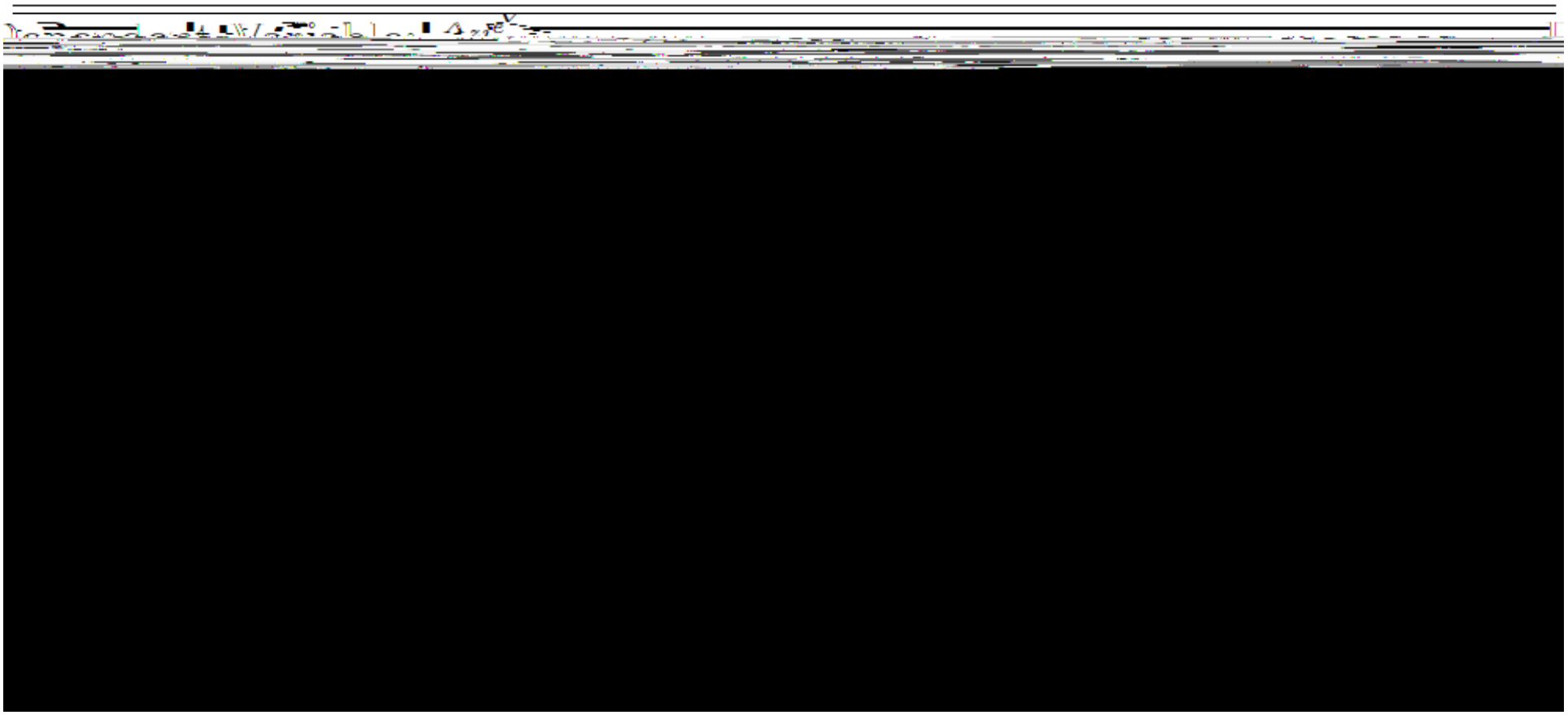
Results: “Incidental” Ownership Changes

Ownership, location, and shipment propensity could be jointly determined

Results: “Incidental” Ownership Changes



Results: “Incidental” Ownership Changes



Adding same-firm downstream establishment to a zip increases shipment share by amount equal to 30% drop in distance

Results: Macro Implications

Apply version of Caliendo and Parro (2015) and Caliendo et al. (2016) to compute implied macroeconomic implications of trade cost reductions of common ownership

- Model contains geographic input-output structure (MSA x 29 industries) of heterogeneous producers
- Implies a gravity-type equation
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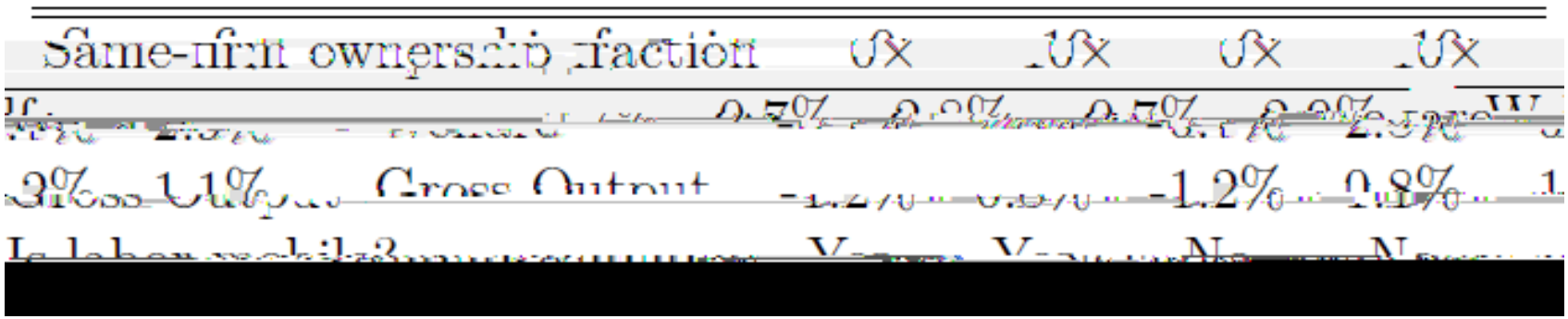
Results: Macro Implications



Conclusions (Tentative)

We propose a new way to quantify the benefits of ownership—what is gained when transactions are brought within a firm

Ownership has considerable effects on transactions at both the micro and macro levels

There’s a lot more to do