The Effect of Competition on Prices in Firm-to-Firm Trade: Evidence from the Russian Food Embargo

Anna Ignatenko

LMU Munich

anna.ignatenko@econ.lmu.de

November 6, 2021

Global trends towards fragmentation and concentration

- Domestic and global markets have become less competitive
  - increasing market concentration (Van Reenen 2018, Ganapati 2021)
  - less merger control (Shapiro 2019); more protectionism (Fajgelbaum et al. 2020)
- Production has become fragmented and scattered across countries
  - trade of intermediate goods takes up more than half of global trade
  - 95% of trade done in firm-to-firm transactions (inc. consumer goods)
- Yet, trade is mostly analyzed within a firm-to-consumer framework
  - unlike firms, consumers do not compete in any markets
  - unlike firms, consumers rarely can negotiate prices with sellers

Research questions

- How does competition affect firms' interactions in supply chains?
- How do value chains propagate shocks to seller competition to final consumers?

Empirical and theoretical challenges

Empirical

- Supply chains (firm-to-firm transactions) are rare to observe
  - firm-level trade data is aggregated either at seller- or buyer- level
- Exogenous shocks to competition are hard to find:
  - HHI, CR4, market shares, and number of firms can be endogenous

Theoretical

- Most trade models assume price-taking buyers or sellers
  - consumers, unlike firms, are price-takers and do not compete

This paper

- New data on firm-to-firm transactions of homogeneous goods:
  - within-seller price dispersion across buyers $\neq$ quality variation
  - price variation with the level of competition $\neq$ quality upgrading
  - (exogenous) shocks to competition within market – political reasons
- New model of firm-to-firm trade with non-price-taking buyers:
  - larger buyers get discounts via a credible replacement threat
  - seller competition increases the buyer-size discounts
  - $\Rightarrow$ dispersion of measured firm productivities increases downstream
  - $\Rightarrow$ market concentration downstream increases in the LR

Contributions to the Literature

- Gains from trade: quality, variety gains, mark-ups

  heterogeneous effects on mark-ups in firm-to-firm trade
- Sources and consequences of growing mark-ups and concentration

  shocks to competition upstream affect market structure downstream
- Distributional effects of trade

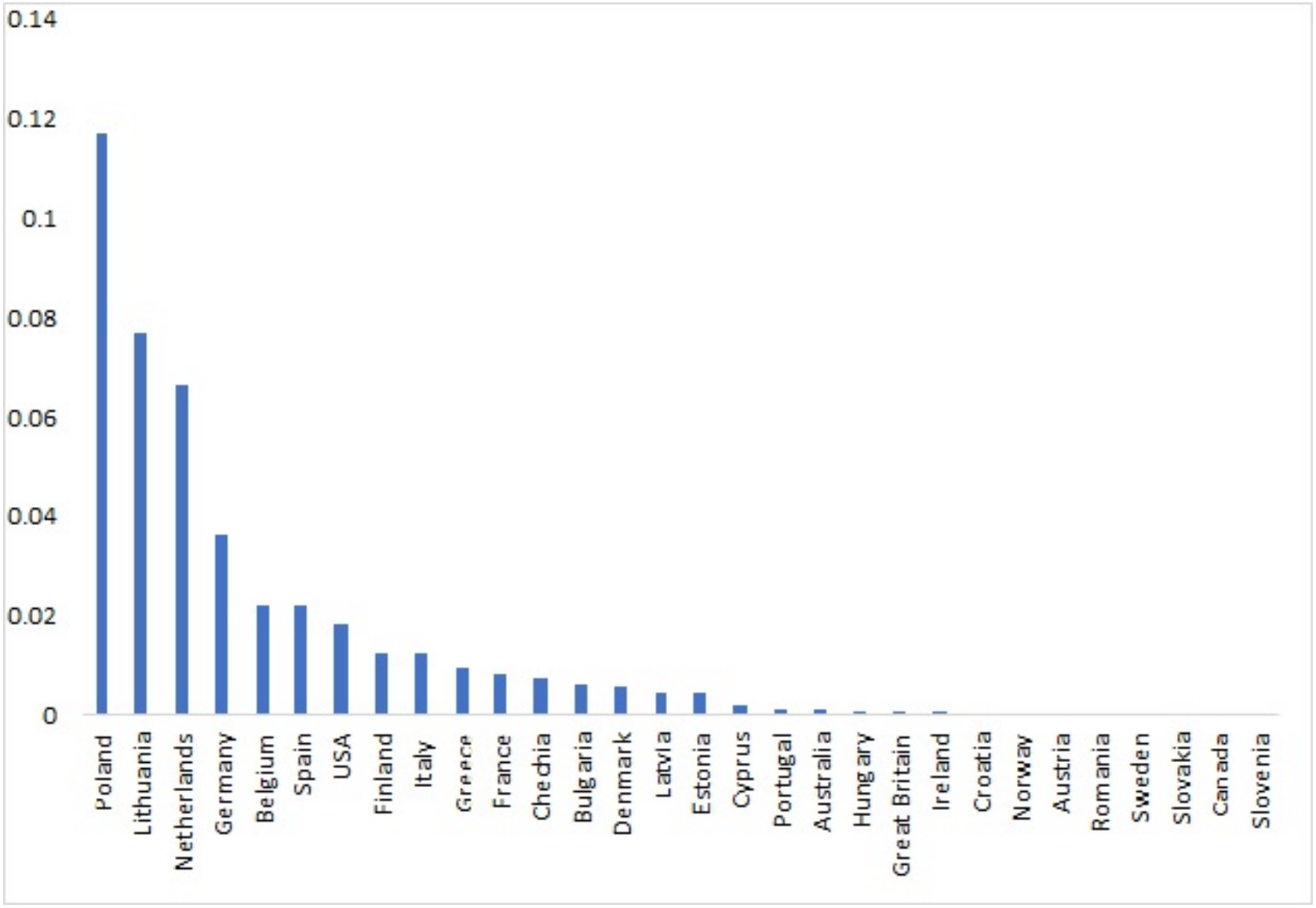
  depends on matching of consumers to importing firms and market structure changes

Unique features of my data and context

- New transaction-level customs data from Russia, 2013 - 2015
  - Importer's id and name: 10% wholesalers, 90% retailers+producers
  - Exporter's name and address: 40% - wholesalers, 60% producers
  - HS10 code, country of origin, producer, brand, (word) description
  - Transacted product's weight (kg) and value (rub/invoice currency)
- August 2014: Russia retaliated political sanctions with an embargo
  - plausibly exogenous shock to competition
  - Embargoed products are relatively homogeneous (agricultural)
  - Embargoed countries were large exporters of embargoed products

Half of embargoed imports were from embargoed countries

- Share of subsequently embargoed countries, 2013

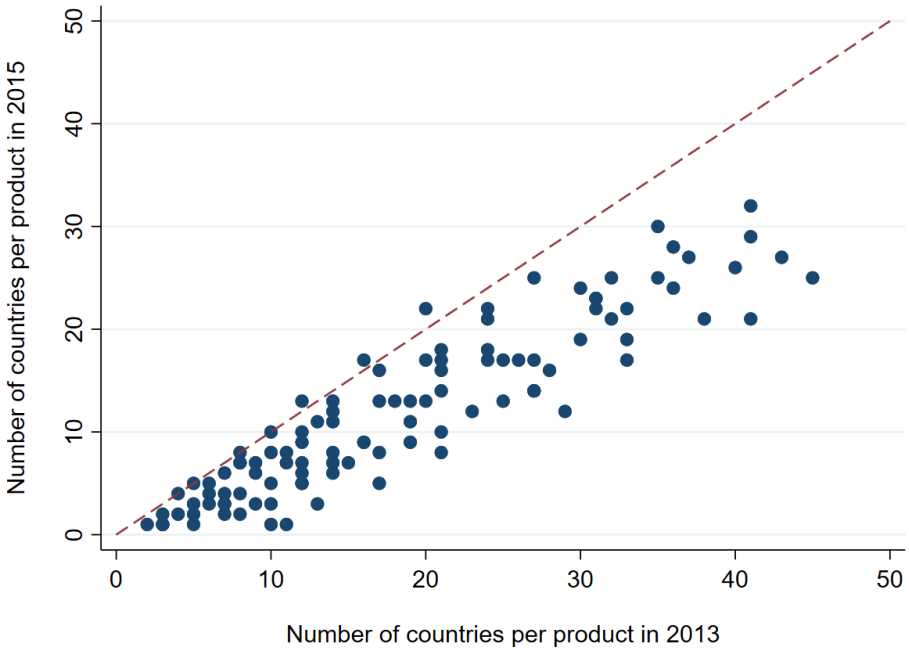


List of embargoed products

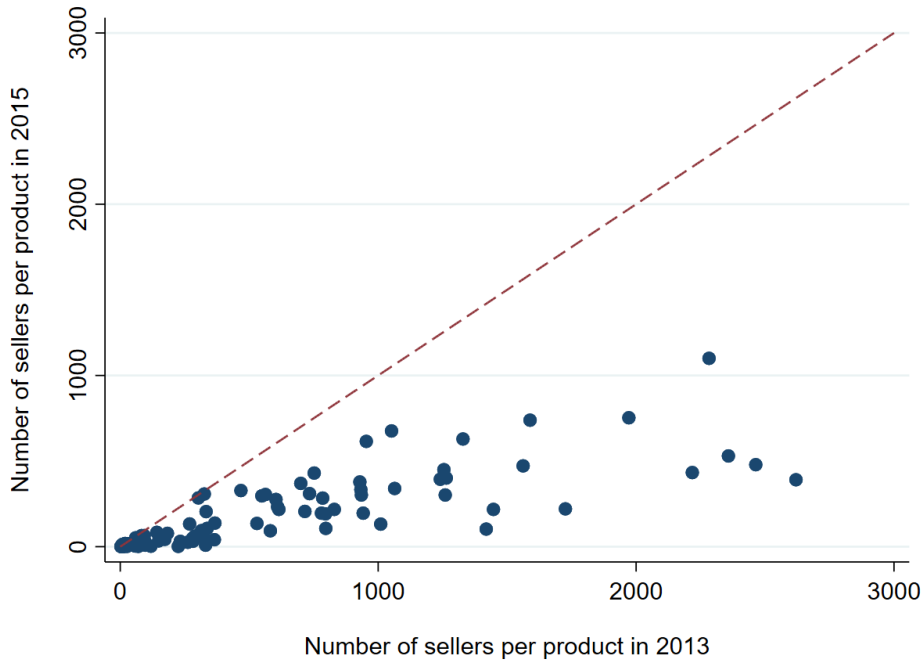
HS4	Short description	HS4	Short description
0201	Meat of bovine animals; fresh or chilled	0706	Carrots, turnips, salad beetroot
0202	Meat of bovine animals; frozen	0707*	Cucumbers and gherkins
0203	Meat of swine; fresh, chilled or frozen	0708	Leguminous vegetables
0207	Meat and edible offal of poultry	0709	Other fresh vegetables
0210	Meat and edible meat offal	0710	Frozen vegetables
0301	Fish; live	0711	Vegetables provisionally preserved
0302	Fish; fresh or chilled	0712	Vegetables, dried
0303	Fish; frozen	0713	Other leguminous vegetables
0304	Fish fillets and other fish meat	0714	Manioc, arrowroot, salep
0305	Fish, dried, salted or in brine	0801	Coconuts, Brazil nuts, cashew nuts
0306	Crustaceans	0802	Other nuts
0307	Molluscs	0803	Bananas, including plantains
0308	Other aquatic invertebrates	0804	Dates, figs, pineapples, avocados
0401	Milk and cream; not concentrated	0805	Citrus fruit
0402	Milk and cream; concentrated	0806	Grapes
0403	Buttermilk, curdled milk and cream	0807	Melons and papaws
0404	Whey and products of milk	0808	Apples, pears and quinces
0405	Butter and other fats and oils derived from milk	0809	Apricots, cherries, peaches, plums
0406	Cheese and curd	0810	Other fresh fruits
0701	Potatoes; fresh or chilled	0811	Fruit and nuts; frozen
0702*	Tomatoes; fresh or chilled	0813	Other dried fruit
0703	Onions, shallots, garlic, leeks	1601*	Meat preparations
0704	Cabbages, cauliflowers, kohlrabi, kale	1901*	Food preparations
0705	Lettuce and chicory	2106*	Other food preparations

Notes: * denotes that some product exclusions apply

2014 Embargo substantially reduced seller competition

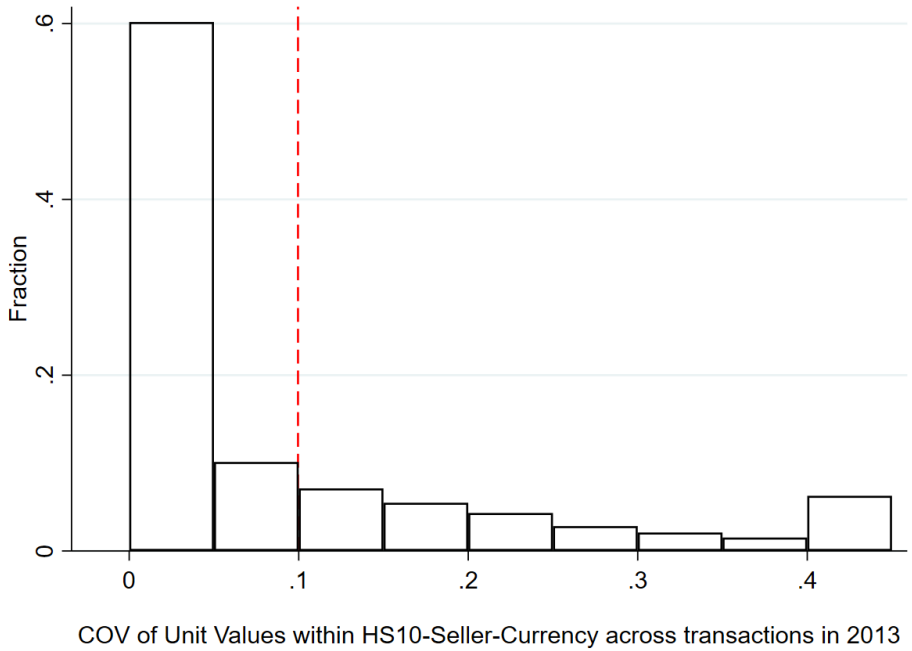


(a) Number of countries/HS10 declined

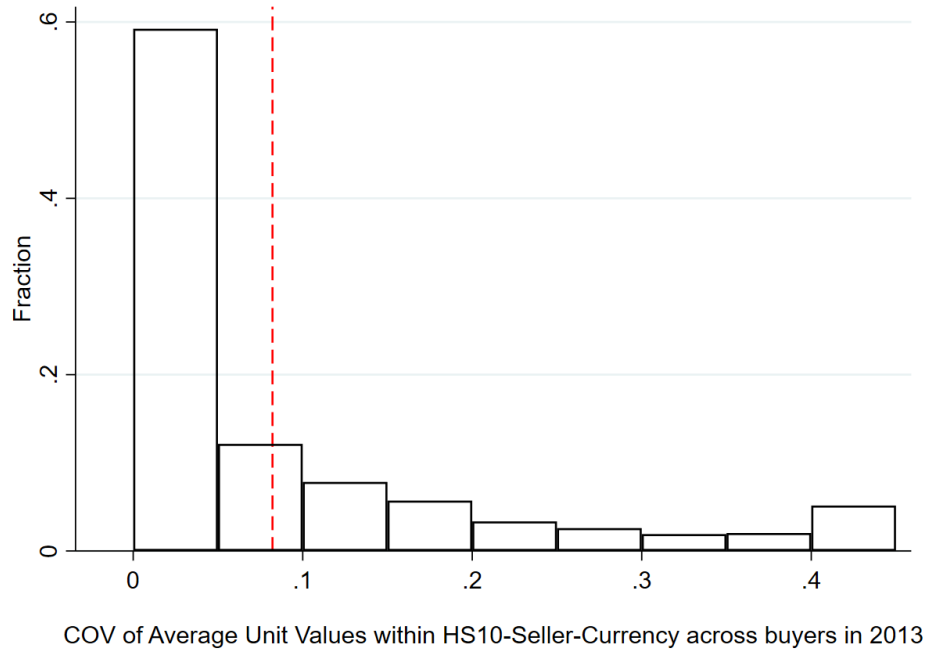


(b) Number of sellers/HS10 declined

Large within-seller price dispersion in narrow categories



(c) Average COV across transactions is 10%



(d) Average COV across buyers is 8%

Larger importers and larger transactions are charged less

Dependent Variable:	log *Transaction Price*				
	(1)	(2)	(3)	(4)	(5)
log *Seller Share in HS4-Buyer*	0.001		0.001	0.005	0.004
	(0.012)		(0.012)	(0.012)	(0.012)
log *Transaction Weight*		-0.010***	-0.010***		-0.009**
		(0.004)	(0.004)		(0.004)
log *Total HS10-Buyer-Seller Weight*				**-0.014****	**-0.012***
				(0.006)	(0.006)
Constant	0.548***	0.618***	0.620***	0.703***	0.742***
	(0.019)	(0.027)	(0.033)	(0.076)	(0.076)
HS10-Seller-Currency-Year	✓	✓	✓	✓	✓
N obs	394835	394835	394835	394835	394835
N clusters	6685	6685	6685	6685	6685
Adj. R2	0.985	0.985	0.985	0.985	0.985

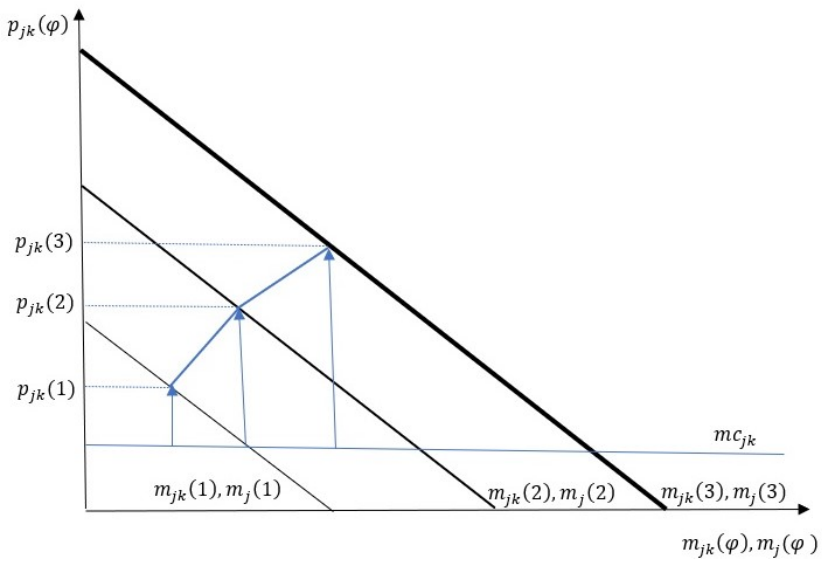
* p<0.10, ** p<0.05, *** p<0.01

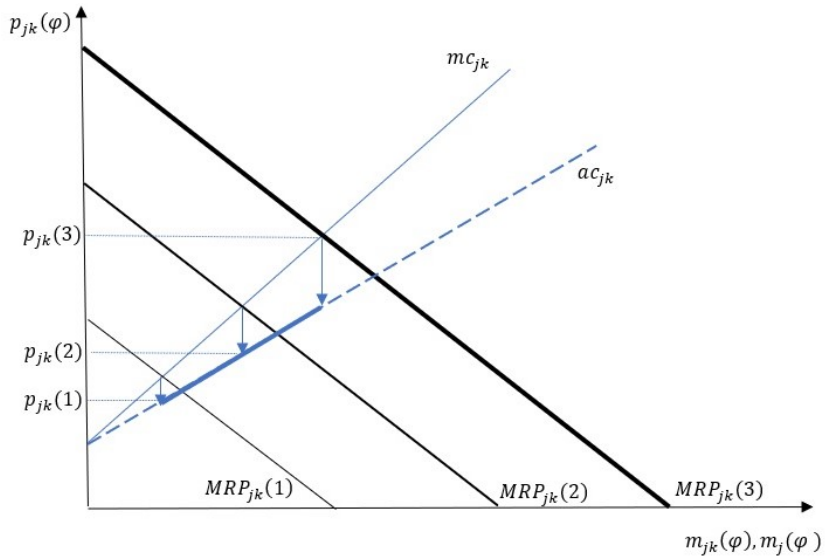
Robust standard errors clustered at exporter level in parentheses.

Market-power mechanisms behind this price dispersion

- Price dispersion under oligopoly (left) and oligopsony (right)

- Larger importers – larger demand
- Oligopoly: larger demand = higher willingness to pay ⇒ higher price
- Oligopsony: larger demand = higher average costs ⇒ higher price

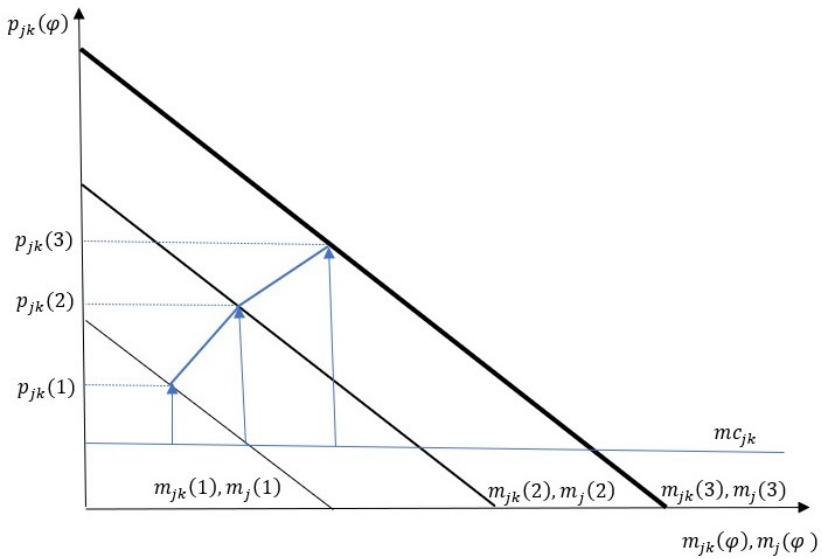


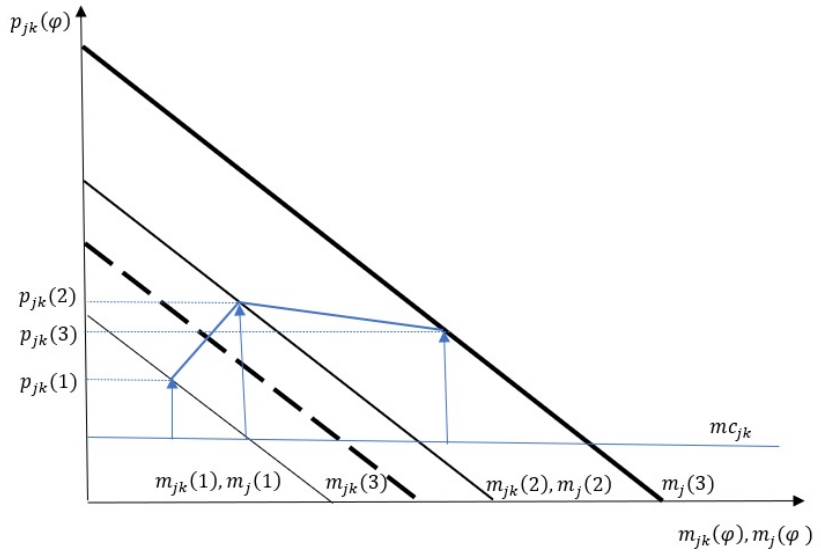


- ⇒ Both imply a positive buyer-size – price relationship

Market-power mechanisms behind this price dispersion

- Allow buyers to affect prices (via replacement threat) under oligopoly





- $\Rightarrow$ Makes buyer-size – price relationship negative, in line with data

The effect of competition on price dispersion

Dependent Variable:	log *Transaction Price*			
	(1)	(2)	(3)	(4)
log *Total HS4-Buyer-Seller Weight*	-0.020***	-0.036***	-0.022**	-0.022**
	(0.006)	(0.012)	(0.010)	(0.009)
log *Total HS4-Buyer-Seller Weight* $\times$ $Embargo_y$		0.025**		
		(0.011)		
log *Total HS4-Buyer-Seller Weight* $\times \Delta \log N_{HS4}$			-0.014*	-0.014*
			(0.008)	(0.007)
log *Transaction Weight*	-0.027***	-0.027***	-0.023***	-0.021***
	(0.007)	(0.007)	(0.006)	(0.005)
log *Declaration Weight*	-0.013*	-0.012	-0.012	-0.010
	(0.008)	(0.008)	(0.008)	(0.008)
Constant	1.065***	1.073***	0.979***	0.948***
	(0.106)	(0.102)	(0.093)	(0.090)
HS10-Seller-Currency-Year	✓	✓	✓	
HS10-Seller-Currency-Year-Origin				✓
N obs	55231	55231	88627	88518
N clusters	594	594	615	614
Adj. R2	0.982	0.982	0.980	0.981

* p<0.10, ** p<0.05, *** p<0.01

Robust standard errors clustered at exporter level in parentheses.

Conclusions

- Prices vary across buyers even in homogeneous goods markets
  - are not entirely driven by cost variation
- There is a negative price - buyer size relationship
  - cannot be explained by oligopsony or standard oligopoly
- Seller competition $\Rightarrow$ larger discounts to larger buyers
  - cannot be explained by oligopsony or cost-based considerations
  - increases the advantage of larger firms downstream

$\Rightarrow$ The effect on consumers is ambiguous:

- $\uparrow$ market concentration downstream $\Rightarrow$ $\uparrow$ mark-ups
- $\downarrow$ input prices (wholesale prices)

$\Rightarrow$ Heterogeneous effects across consumers:

- depends on where they are shopping: small vs. large retailers
- depends on where they live: small/poor vs. large/rich regions