Measuring Competition Policy Effectiveness:

15 years of research and policy work

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Setting the scene
Competition, Regulation, and Competition Policy

Regulation & Competition Policy

Large consensus on the welfare-enhancing properties of competition

- Process that allows achieving allocative, productive, and dynamic efficiency

What should we do if there is a clear market failure?

- Regulation: Specific ex-ante intervention to "fix the problem" with specific tools affecting specific markets
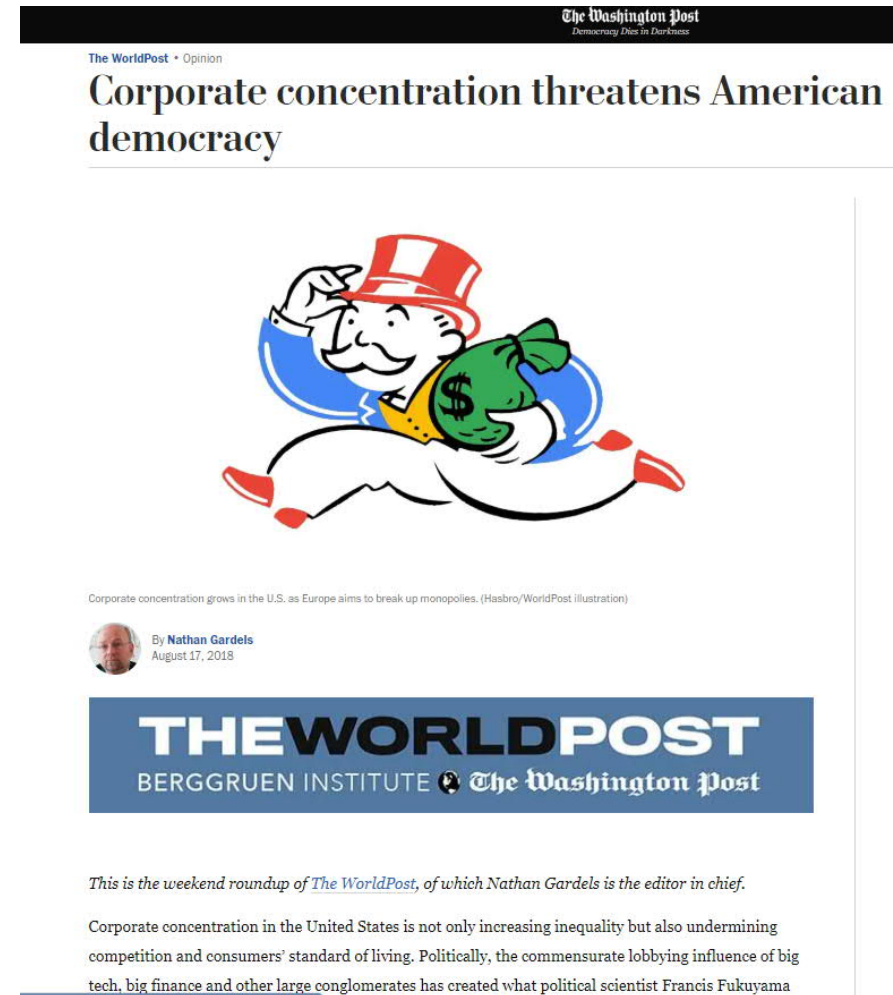
...and if there is not a clear market failure?

- Competition policy: a general system of rules (competition law) and a set of institutions effectively applying these rules

- Ex-post intervention if rules are not respected

- A broad set of provisions (monopolization & abuse of dominance, merger control, collusion & cartels, state aid) affecting all markets simultaneously

Competition in the globalized economy

Competition

The next capitalist revolution

Market power lies behind many economic ills. Time to restore competition

THE NEXT CAPITALIST REVOLUTION

📖 Print edition | Leaders ›

Nov 15th 2018

C APITALISM HAS suffered a series of mighty blows to its reputation over the past decade. The sense of a system rigged to benefit the owners of capital at the expense of workers is profound. In 2016 a survey found that more than half of young Americans no longer support capitalism. This loss of faith is dangerous, but is also warranted. Today's capitalism does have a

The Economist – Nov 15 2018

The Washington Post
Democracy Dies in Darkness

The WorldPost • Opinion

Corporate concentration threatens American democracy

Corporate concentration grows in the U.S. as Europe aims to break up monopolies. (Hasbro/WorldPost illustration)

By **Nathan Gardels**
August 17, 2018

THE WORLD POST
BERGGRUEN INSTITUTE & The Washington Post

This is the weekend roundup of The WorldPost, of which Nathan Gardels is the editor in chief.

Corporate concentration in the United States is not only increasing inequality but also undermining competition and consumers' standard of living. Politically, the commensurate lobbying influence of big tech, big finance and other large conglomerates has created what political scientist Francis Fukuyama

The Washington Post – Aug 17 2018

Increasing concentration in industries

Figure 8. Differing Concentration Metrics (CR4, CR8, CR20) in Europe & North America
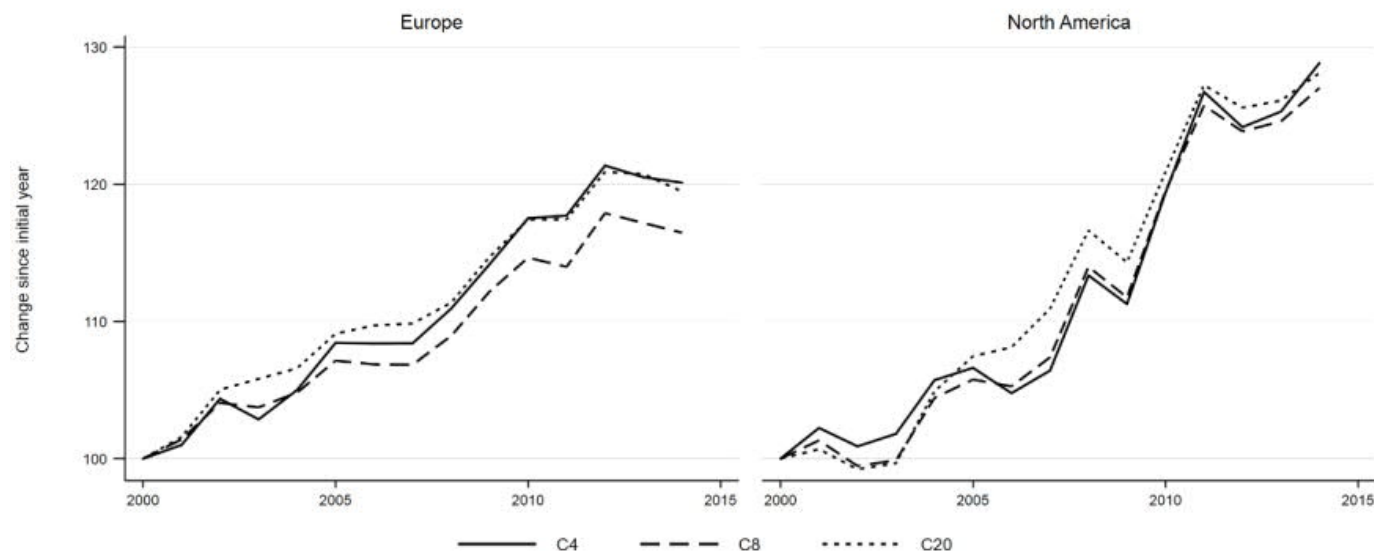
Note: The countries for Europe include BE, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LV, NL, NO, PL, PT, SI, SE, and for North America include CA and US. Included industries cover 2-digit manufacturing and non-financial market services. Concentration metrics reflect the share of the top 4, top 8 and top 20 firms in each industry – unweighted metrics (CR4, 8 and 20 respectively). To ensure comparability across different metrics, these now reflect *proportional* changes. The graphs can be interpreted as the cumulated *percentage* changes in levels of sales concentration for the mean 2-digit sector within each region. For instance, in 2014 the mean European industry had 20% higher CR4 sales concentration compared to 2000.

Bajgar, Berlinghieri, Calligaris, Criscuolo, Timmis, 2019

Increasing margins worldwide

Made from concentrate

Company markups*, ratio of sales prices to costs

North America

Europe

South America

Oceania

Asia

Africa
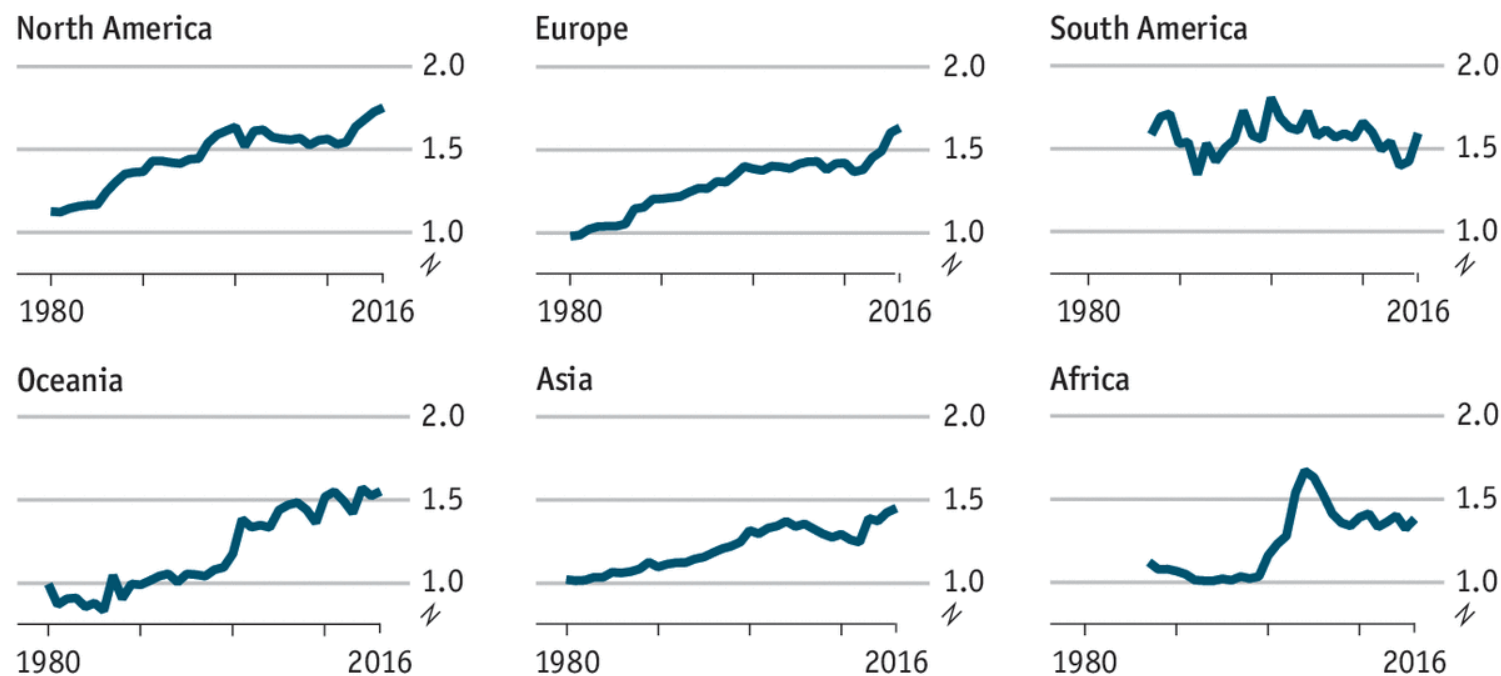
Source: "Global market power" by J. De Loecker and J. Eeckhout, NBER 2018

*70,000 firms in 134 countries

Economist.com

The Economist – Nov 15 2018

Who is to blame?

"We find no evidence that antitrust policy in the areas of monopolization, collusion, and mergers has provided much benefit to consumers and, in some instances, we find evidence that it may have lowered consumer welfare."

Crandall and Winston (2003). Does Antitrust Policy Improve Consumer Welfare? Assessing the Evidence. Journal of Economic Perspectives. 17 (4): 3-26.

"Competition has declined in most sectors of the US Economy. [...] The lack of competition is explained largely by policy choices influenced by lobbying [...] Corporate lobbying and campaign finance contributions lead to barriers to entry and regulations that protect large incumbents, weaker antitrust enforcement, and weaker growth of mall and medium sized firms."

Phlippon (2019). The Great Reversal: How America Gave Up on Free Markets. Harvard University Press.

Measure what is measurable & make measurable what is not

The goals of competition policy is to protect (consumers) welfare by:

I.   Punishing misbehavior: desistence

II. Discouraging misbehavior: deterrence

Limited evidence on whether competition policy is socially beneficial

i.   There are many potential misbehaviors: difficult to measure desistence, i.e. whether the policy effectively punished all of them

ii. Difficult to measure deterrence: if we measure what we see we only capture the 'top of the iceberg'

Measuring desistance – The micro level

Argentesi, Buccirossi, Cervone, Duso, Marrazzo (2015). Mergers in the Dutch grocery sector: an ex-post evaluation. Assessing the effects on price and non-price dimensions of competition. Study commissioned by the Dutch Authority for Consumers and Markets.

Argentesi, Buccirossi, Cervone, Duso, Marrazzo (2019). Price or Variety? An Evaluation of Mergers Effects in Grocery Retailing. DIW Discussion Paper 1734.

The effect of retail mergers on prices and variety

In 2011, Jumbo and C1000, two large Dutch full-service supermarket chains proposed to merge

Authority for
Consumers & Markets

The ACM Identified problematic areas (relevant market) where the chains competed door to door and had joint MS>50%

Cleared the merger in February 2012, conditionally on the divestiture of 18 stores in some of these areas

Ex-post merger evaluation – Empirical strategy

We adopt a difference-in-differences empirical strategy

Non-overlap

Overlap

Non-overlap
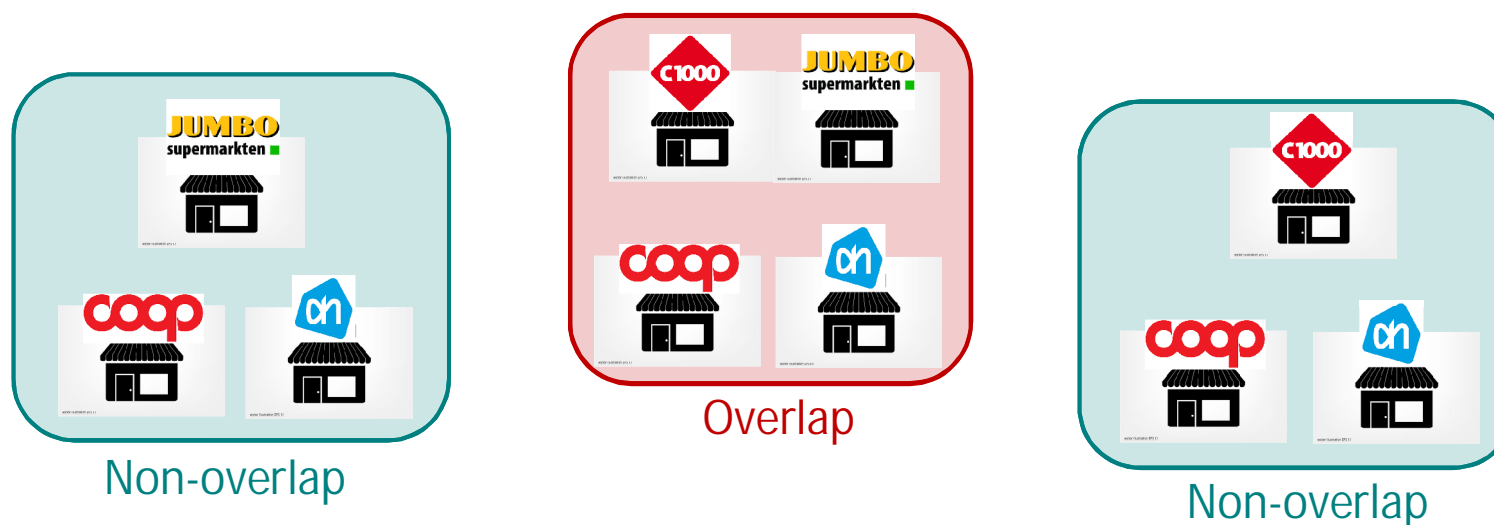
$$Out_{ist} = \alpha + \beta \cdot post_t + \lambda \cdot overlap_s + \delta \cdot post_t \times overlap_s + \mu \cdot Z_{st} + \nu_{is} + \eta_t + \varepsilon_{ist}$$

Stores selection

Store-level scanner data from IRI on 171 stores for both the merging parties and competitors

Selection of the areas by propensity score matching (treatment: presence of both chains in the same area)

1. Identify relevant variables (demand & supply side) which characterize an area (municipality)
2. Estimate the predicted probability of assignment to treatment for all areas
3. Match (without replacement) each treated area with the control area that has the closest pscore
4. For each area choose some stores of the merging parties and some of the competitors – restrict our analysis to regular supermarket

The data from IRI

1. **Monthly data** on **prices** for 3 products in 11 categories (coffee, cola, cleaners, diapers, fresh milk, frikandels, mayonnaise, olive oil, sanitary napkins, shampoo, and toilet paper) – ca. 125,000 obs

PRODUCTS			CHAINS			
Category			C1000	Jumbo	Coop	Albert Heijn
Cleaners	A-brand	Ajax	■	■	■	■
		CITRONELLA				
		WITTE REUS	■	■	■	■
	Private label	Albert heijn				■
		C1000	■			
		JUMBO		■		
		MARKANT			■	
		O'LACY		■		
Coffee	A-brand	Douwe egberts			■	■
		KANIS & GUNNINK	■	■		
		VAN NELLE SUPRA	■			
	Private label	C1000	■			
		JUMBO		■		
		MARKANT			■	
		PERLA				■
Cola	A-brand	Coca cola	■	■	■	■
		PEPSI	■	■	■	■
	Private label	Albert heijn	■			■
		C1000	■			
		JUMBO		■		
		MARKANT			■	
		O'LACY		■		

2. **Quarterly data** on **variety** (number of products) and **average category prices** for 125 product categories – ca. 225,000 obs.
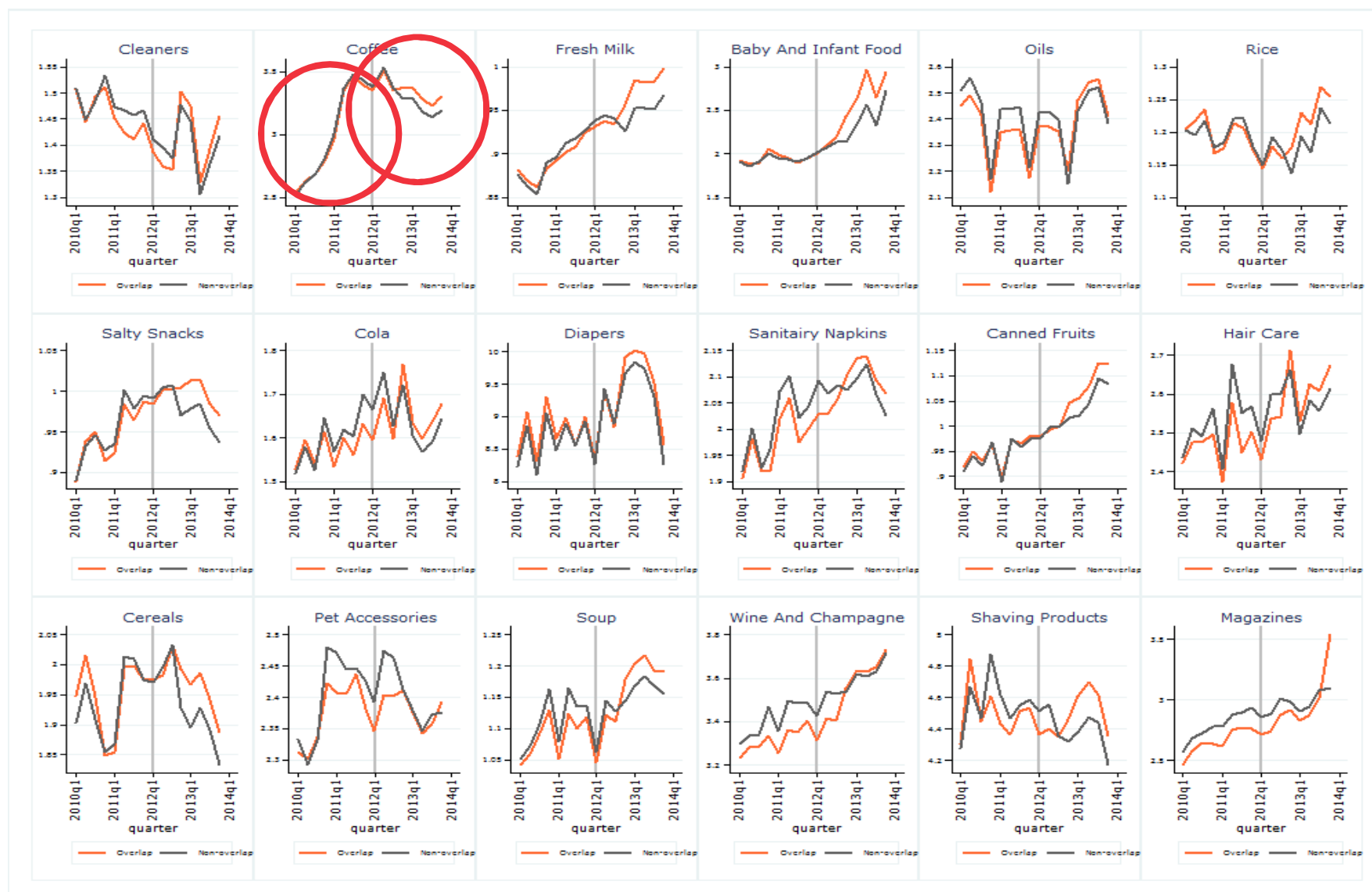
Measuring Competition Policy Effectiveness

Price – Descriptives
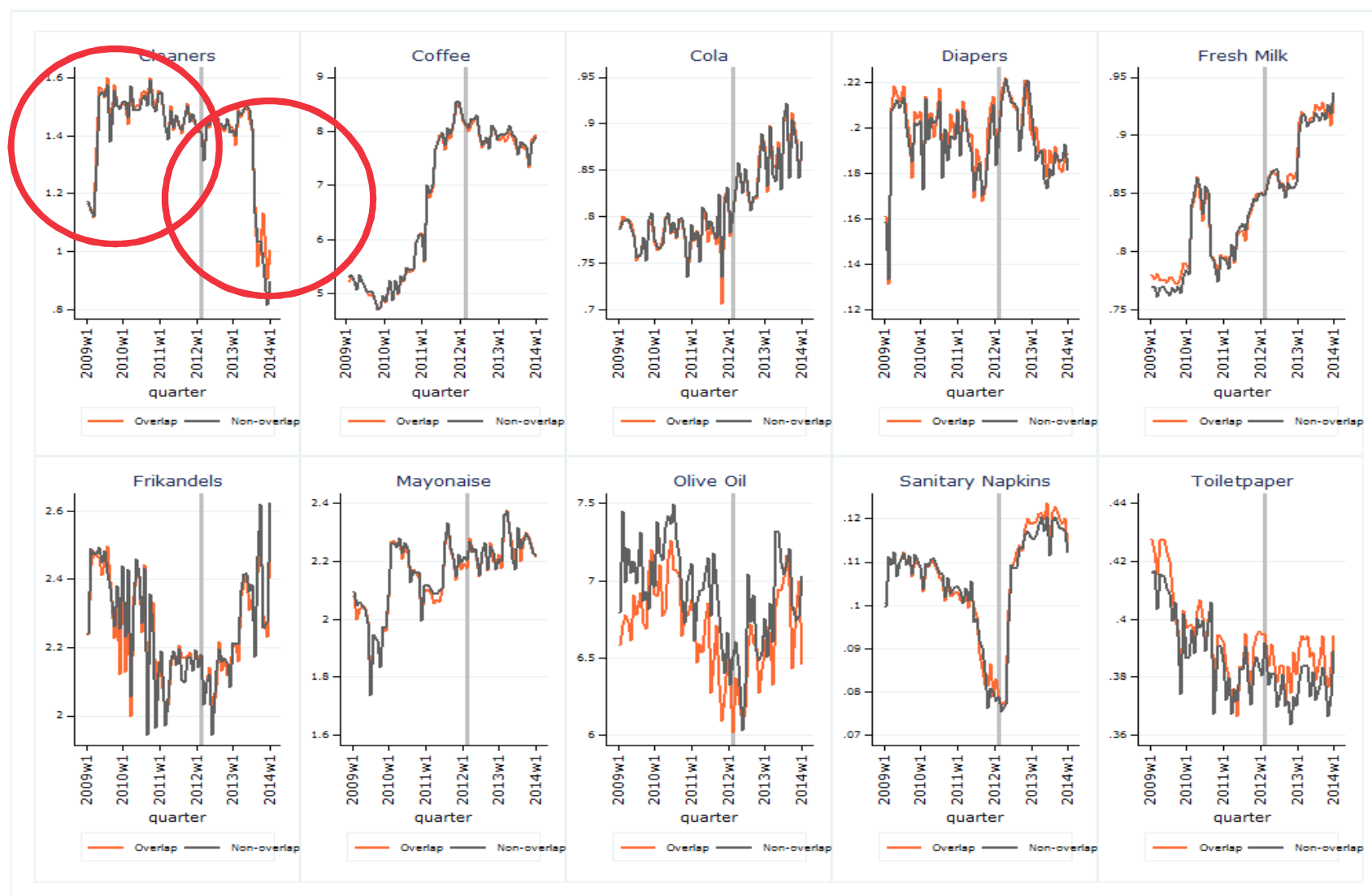
Variety – Descriptives

Average Category Prices – Descriptives

The story

On average, the merger

- Did not affect SKU prices   Table
- Reduced product variety (-3.2%)   Table
- Increased average category prices (1.8%)   Table

These average results are driven by two opposite effects

- Low-price/low-variety chain C1000 decreased assortment (-15%) and decreased average prices (-2%) → dropped high-price products
- High-price/high-variety chain Jumbo increased assortment (+8%) and increased prices (+8%) → added high-price products

Theory shows: Product repositioning to avoid cannibalization & soften competition

- The high-quality/high-price store (Jumbo) becomes even more high-quality/high-price, while the low-quality/low-price store (C1000) becomes even more low-quality/low-price

These effects are mitigated by the divestitures imposed by the ACM

What did we learn?

1. Important to understand the market and look (also) at the mergers' non-price effects

2. Important to look at heterogeneity

3. Important to think about the economic theory behind the empirical findings

4. Comprehensive assessment reveals that the merger may have harmed (some) consumers by lowering assortment and increasing category prices

5. Competition policy intervention (remedies) alleviated the problem, but did not completely solve it

Measuring deterrence – The macro level

Buccirossi, Ciari, Duso, Spagnolo, and Vitale (2008). Development and Application of a Methodology for Evaluating the Effectiveness of Competition Policy. Study commissioned by DG Economic and Financial Affairs of the European Commission

Buccirossi, Ciari, Duso, Spagnolo, and Vitale (2011). Measuring the Deterrence Effect of Competition Policy: The Competition Policy Indexes, (with Paolo), Journal of Competition Law and Economics, 7, 165-204

Buccirossi, Ciari, Duso, Spagnolo, and Vitale (2013). Competition Policy and Productivity Growth: An Empirical Assessment, The Review of Economics and Statistics, 95, 4, 1324-1336

Competition policy as a deterrence system

The optimal level of deterrence is determined by (Becker, JPE 1968; Polinsky and Shavell, JEL 2000):

i)   Size of the sanctions

ii) (Perceived) probability of detection and conviction, and

iii) (Perceived) probability of errors

What policy variables affect these three factors?

– Formal independence of the CA with respect to political or economic interests

– Degree of separation between the adjudicator and the prosecutor

– Quality of the law on the books

– Level of loss (sanctions) that firms (and their employees) can expect to suffer as a consequence of a conviction

– Type of investigative powers held by the CA

– Amount and quality of the CA's financial and human resources (the budget and skills of the CA's staff)

Measuring competition policy

We submitted tailored questionnaires to the Competition Authorities (CAs) in 13 jurisdictions and integrated with additional information

- We obtained various information on six policy variables (determinants of deterrence), separately for each type of possible competition law infringement (hard-core cartels, abuses, other infringements) and for mergers over the years from 1995 to 2005

- Each piece of information at each step of the aggregation process was assigned a score/weight on a scale of 0-1 against a benchmark of generally agreed best practice

- We test the sensitivity of this weighting scheme to alternative ones using 1) equal weights, 2) 1,000 sets of random weights, and 3) factor analysis

The Competition Policy Indexes (CPIs)

Table 1. The low-level indexes

Abuses	Hardcore cartels	Other anticompetitive agreements	Mergers
Independence: Nature of prosecutor (1/2) Nature of adjudicator and role of government (1/2)	**Independence:** Nature of prosecutor (1/2) Nature of adjudicator and role of government (1/2)	**Independence:** Nature of prosecutor (1/2) Nature of adjudicator and role of government (1/2)	**Independence:** Nature of bodies involved in Phase 1 and 2 (1/2) Role of government in decision (1/2)
Separation of powers: Separation between adjudicator and prosecutor (2/3) Nature of appeal court (1/3)	**Separation of powers:** Separation between adjudicator and prosecutor (2/3) Nature of appeal court (1/3)	**Separation of powers:** Separation between adjudicator and prosecutor (2/3) Nature of appeal court (1/3)	**Separation of powers:** Separation between adjudicator and prosecutor (1/3) Separation between Phase 1 and 2 (1/3)
Quality of the law: Standard of proof for predation and goals that inform decision (1/2) Standard of proof for refusal to deal and goals that inform decision (1/2)	**Quality of the law:** Standard of proof and goals that inform decision (1/2) Leniency program (1/2)	**Quality of the law:** Standard of proof for exclusive contracts and goals that inform decision	**Quality of the law:** Obligation to notify (1/2) Efficiency clause (1/2)
Powers during investigation: Combination of powers (3/4) Availability of interim measures (1/4)	**Powers during investigation:** Combination of powers	**Powers during investigation:** Combination of powers (3/4) Availability of interim measures (1/4)	
Sanction policy and damages: Sanctions to firms (1/3) Sanctions to individuals (1/3) Private actions (1/3)	**Sanction policy and damages:** Sanctions to firms (1/3) Sanctions to individuals (1/3) Private actions (1/3)	**Sanction policy and damages:** Sanctions to firms (1/3) Sanctions to individuals (1/3) Private actions (1/3)	
Resources: Budget (1/2) Staff (1/4) Staff skills (1/4)	**Resources:** Budget (1/2) Staff (1/4) Staff skills (1/4) **Sanctions and cases:** Number of cases opened (1/3) Max jail term imposed (2/3)	**Resources:** Budget (1/2) Staff (1/4) Staff skills (1/4)	**Resources:** Budget (1/2) Staff (1/4) Staff skills (1/4) **Cases:** Number of mergers examined

Source: Buccirossi, Ciari, Duso, Spagnolo, and Vitale (JCLE 2011).

The Aggregated Competition Policy Indexes (CPIs)

Source: Buccirossi, Ciari, Duso, Spagnolo, and Vitale (JCLE 2011).

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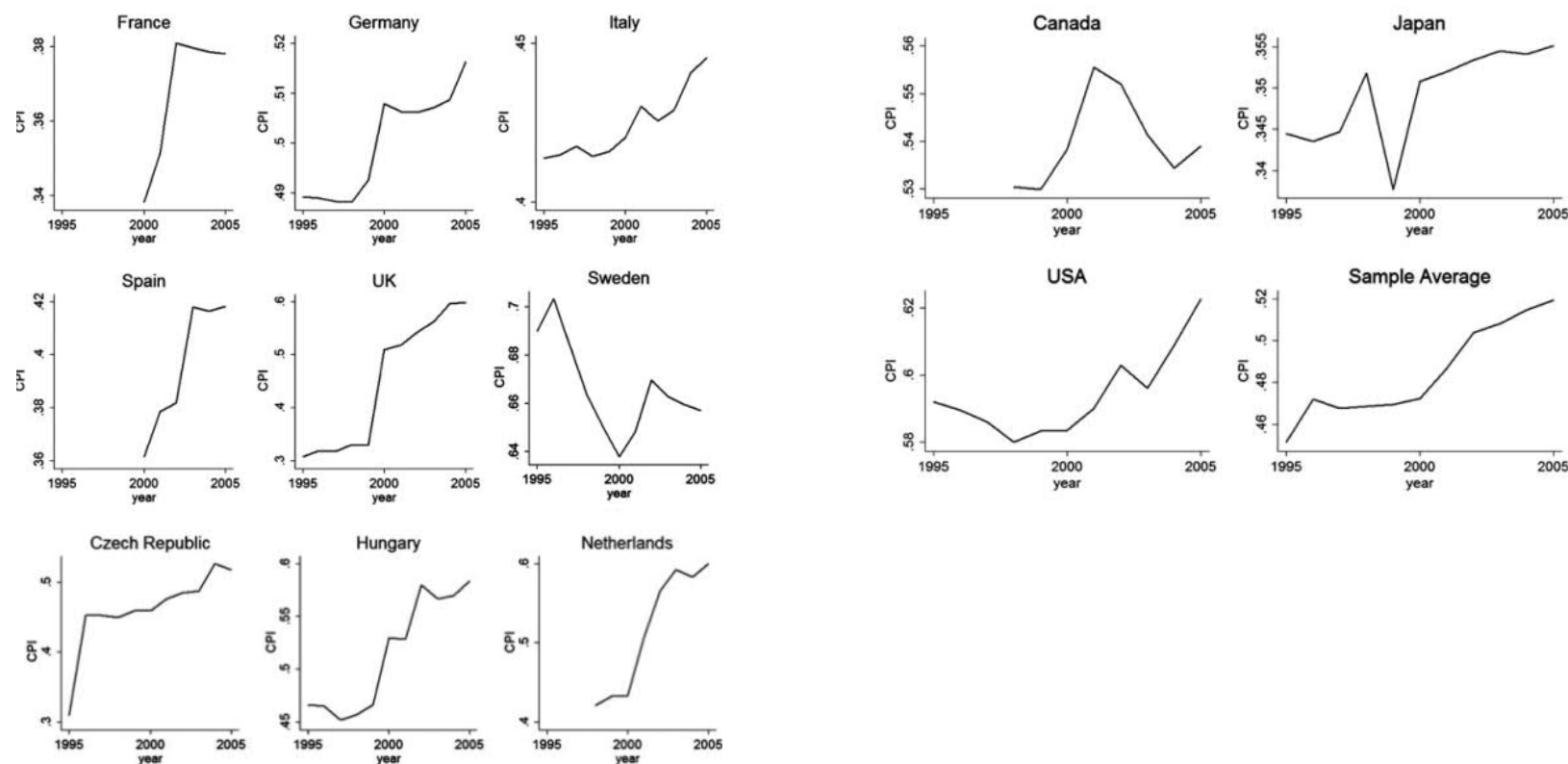
Estimating competition policy's effectiveness

To assess the effectiveness of competition policy we build on a model of endogenous growth (e.g., Aghion et Howitt, E'trica 2009)

- Laggard industries try to catch up with the technological frontier by innovating

- Leader industries, try to escape competition by innovating and pushing forward the technological frontier

We analyze the following causal links (e.g. Griffith et al., REStat 2004):

- Competition Policy → [Competition] → Efficiency

- As a measure of efficiency we choose TFP (and LP) growth

- We control for all major drivers of TFP growth and estimate the following model:

$$\Delta TFP_{ijt} = c + \alpha CPI_{it-1} + \beta \Delta TFP_{Ljt} + \delta \left(\frac{TFP_{ijt}}{TFP_{Ljt}} \right) + \gamma X_{ijt-1} + \sigma Z_{it-1} + \omega_{ij} + \tau_t + \epsilon_{ijt}$$

Main results

TABLE 2.—BASIC OLS REGRESSIONS: AGGREGATED INDEX

Dependent Variable	ΔTFP (1)	ΔTFP (2)	ΔLP (3)	ΔTFP (4)	ΔTFP (5)	ΔLP (6)
L.CPI	0.0731** (0.0246)		0.0652** (0.0219)	0.0924*** (0.0243)		0.0884*** (0.0225)
L.CPI (equal weights)		0.0848*** (0.0253)			0.0925*** (0.0209)	
TFP/LP leader				0.0653** (0.0233)	0.0651** (0.0233)	0.0795** (0.0351)
L.Techno Gap(TFP/LP)				0.0075* (0.0041)	0.00748* (0.0042)	0.0113*** (0.0024)
Industry trend				0.0445*** (0.0052)	0.0464*** (0.0054)	0.0548*** (0.0064)
L.Import penetration				0.0144*** (0.0039)	0.0144*** (0.0039)	0.0235** (0.00897)
L.PMR				−0.0312 (0.0196)	−0.0264 (0.0203)	−0.0143 (0.0161)
Constant	−0.288*** (0.0140)	0.171*** (0.0167)	0.144*** (0.0174)	−0.137** (0.0536)	−0.151** (0.0527)	−0.969*** (0.150)
Observations	1,847	1,847	1,863	1,847	1,847	1,863
R^2	0.250	0.251	0.234	0.269	0.269	0.278

In columns 1, 2, 4, 5, and 7, the dependent variable is TFP growth corrected for markups. In columns 3 and 6, the dependent variable is LP growth. Standard errors in parentheses are robust and allow for correlation among industries in the same country. In all regressions, we insert country-industry dummies and time dummies. Significant at *10%, **5%, and ***1%.

Source: Buccirossi, Ciari, Duso, Spagnolo, and Vitale (REStat 2013).

Measuring compeitition policy

Competition policy has a positive impact on TFP and LP growth, which is statistically significant at the 1% level

  – The impact is economically significant: e.g. the actual improvement of the CPI in the UK in 2001-2002, is responsible for 22.1% of the increase of TFP growth in that year (in "food products" 0.7% out of 5.2%)

We provide evidence to support the causality of this effects

  – Instrumental variables: political variables as instruments for policy (e.g. Besley and Case, QJE 1995; Duso & Röller, EL 2003; Duso, PC 2005)

  – Heterogeneous effects: competition policy is more effective where legal institutions are more efficient
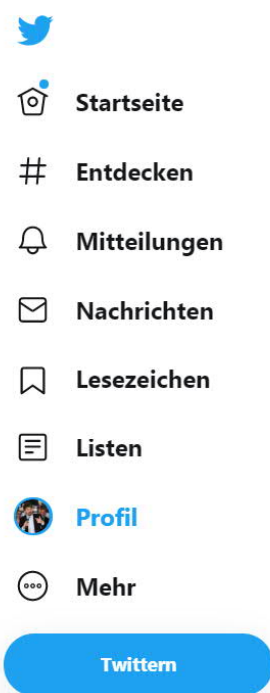
The institutional dimension of the policy –more than its enforcement— and the antitrust policy –more than the merger control— seem to have a stronger impact

Is competition policy effective?

1. Yes: it helps improving (consumers) welfare and economic productivity

2. Its enforcement should be case-by-case and effect-based

3. To understand what tools are better working and improve its effectiveness, competition policy needs to be constantly evaluated

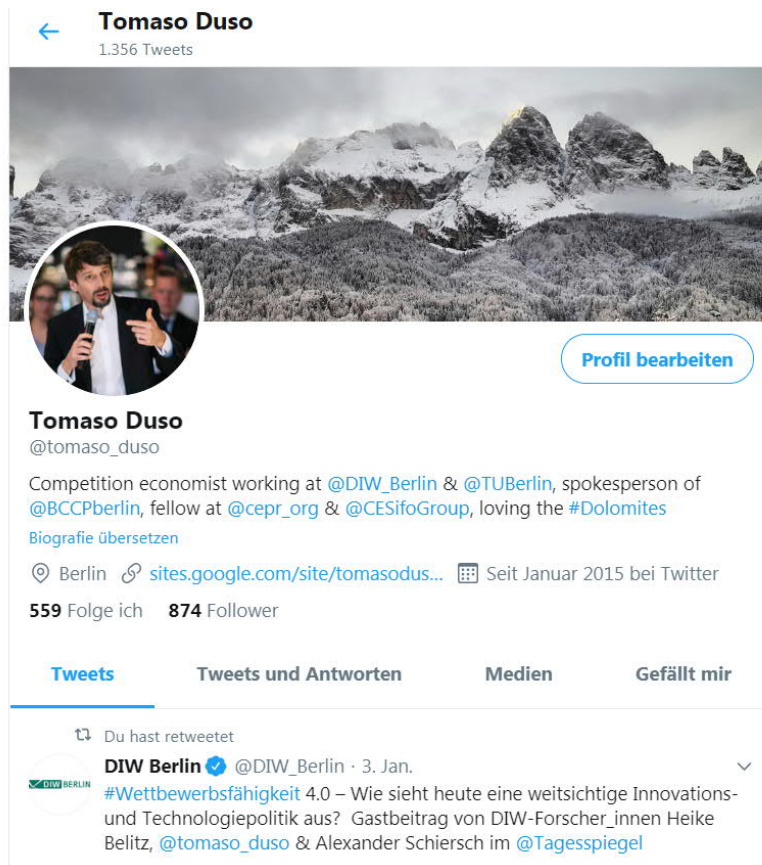4. It should be even tougher enforced than it was in the past

Do you want to know more?

....follow me on Twitter: @tomaso_duso!

Thank you for your attention!
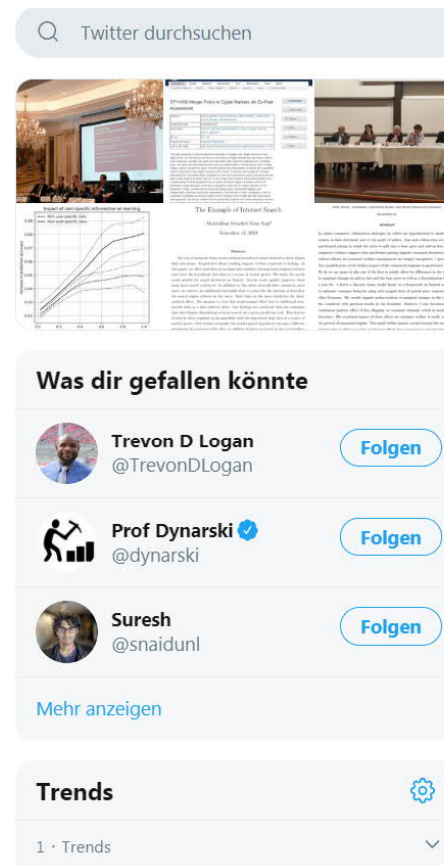
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Price – Regressions

	(1) Full sample	(2) C1000	(3) Jumbo	(4) Competitors
Post	-0.105***	-0.0855***	-0.0979**	-0.139***
	(0.016)	(0.024)	(0.030)	(0.028)
Overlap	-0.00712	-0.00704	-0.00821	-0.0126
	(0.011)	(0.017)	(0.023)	(0.020)
Overlap×Post	0.00133	-0.00390	0.00733	0.0120
	(0.027)	(0.046)	(0.039)	(0.048)
Population	-0.000140	-0.000198	-0.0000585	-0.0000528
	(0.000)	(0.000)	(0.000)	(0.000)
Average Income	0.00210	0.000418	0.00189	0.00339
	(0.001)	(0.003)	(0.004)	(0.002)
Discounters Market Share	0.0459*	0.0135	0.0873	0.0823*
	(0.020)	(0.028)	(0.067)	(0.037)
HHI	0.0000745	-0.000121	0.000314	-0.000279
	(0.000)	(0.000)	(0.000)	(0.001)
Net Sales Floor	0.00000302	0.00000990	-0.00000281	-0.000000980
	(0.000)	(0.000)	(0.000)	(0.000)
House Value	0.0000173	0.0000548	0.0000173	-0.0000110
	(0.000)	(0.000)	(0.000)	(0.000)
Quarter	0.0388***	0.0351***	0.0347***	0.0453***
	(0.002)	(0.003)	(0.005)	(0.004)
Constant	-6.149***	-5.317***	-5.392***	-7.451***
	(0.465)	(0.687)	(0.933)	(0.832)
Observations	122,213	48,362	30,279	43,572
R^2	0.9532	0.9510	0.9612	0.9514

Clustered-robust standard errors at the product-insignia level in parentheses. We control for fixed effect at the product-insignia level as well as a time trend and quarterly seasonal dummies. The symbols ***, **, * denote significance level at the 1%, 5%, and 10% significance level, respectively.

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Variety – Regressions

	(1) Full sample	(2) C1000	(3) Jumbo	(4) Competitors
Post	-2.402***	0.424	-6.504***	-1.099
	(0.559)	(0.656)	(1.052)	(0.727)
Overlap	3.071***	11.41***	-0.0837	-4.153***
	(0.537)	(1.272)	(0.377)	(0.872)
Overlap×Post	-3.065***	-14.70***	8.659***	0.722*
	(0.364)	(1.458)	(0.938)	(0.290)
Population	-0.0798***	-0.145***	0.0753***	-0.00998
	(0.011)	(0.021)	(0.014)	(0.017)
Average Income	0.399***	-1.117***	-0.841***	2.114***
	(0.097)	(0.182)	(0.172)	(0.253)
Discounters Market Share	0.425	-21.50***	24.72***	15.90***
	(1.243)	(2.901)	(2.799)	(2.885)
HHI	-0.0874***	-0.238***	0.0820***	-0.157***
	(0.011)	(0.028)	(0.013)	(0.039)
Net Sales Floor	0.438***	0.869***	0.0165	0.184***
	(0.047)	(0.094)	(0.019)	(0.027)
House Value	0.0229***	0.0422***	0.0583***	-0.0163***
	(0.004)	(0.006)	(0.007)	(0.004)
Quarter	0.532***	1.014***	-0.204	0.294*
	(0.109)	(0.153)	(0.116)	(0.117)
Constant	58.21*	-35.44	216.9***	82.93**
	(22.897)	(31.216)	(23.002)	(26.022)
Observations	225,667	90,484	72,056	63,127
R^2	0.8806	0.8342	0.9047	0.9418

Clustered-robust standard errors at the category-insignia level in parentheses. We control for fixed effect at the category-insignia level as well as a time trend and quarterly seasonal dummies. The symbols ***, **, * denote significance level at the 1%, 5%, and 10% significance level, respectively.

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Category prices – Regressions

	(1) Full sample	(2) C1000	(3) Jumbo	(4) Competitors
Post	-0.0361***	-0.0185	-0.0836***	-0.0215***
	(0.005)	(0.012)	(0.007)	(0.005)
Overlap	-0.00559	0.0219*	-0.00801	-0.0201**
	(0.005)	(0.011)	(0.007)	(0.007)
Overlap×Post	0.0254***	-0.0391**	0.148***	-0.00930
	(0.007)	(0.014)	(0.013)	(0.008)
Population	-0.000178	-0.000467**	0.00110***	-0.000392**
	(0.000)	(0.000)	(0.000)	(0.000)
Average Income	0.00237*	-0.00390	-0.0126***	0.0129***
	(0.001)	(0.003)	(0.002)	(0.002)
Discounters Market Share	0.0883***	0.0644*	0.0329	0.138***
	(0.017)	(0.032)	(0.027)	(0.035)
HHI	0.00119***	0.000451	0.00247***	-0.0000795
	(0.000)	(0.000)	(0.000)	(0.000)
Net Sales Floor	-0.00000197	0.0000142*	-0.0000165***	-0.00000404
	(0.000)	(0.000)	(0.000)	(0.000)
House Value	0.000310***	0.000446***	0.000571***	0.000125
	(0.000)	(0.000)	(0.000)	(0.000)
Quarter	0.0103***	0.0164***	0.00150	0.0102***
	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.934***	-0.425	2.975***	0.838***
	(0.107)	(0.223)	(0.228)	(0.148)
Observations	216,060	77,605	71,960	51,881
R^2	0.8873	0.8412	0.8918	0.9499

Clustered-robust standard errors at the category-insignia level in parentheses. We control for fixed effect at the category-insignia level as well as a time trend and quarterly seasonal dummies. The symbols ***, **, * denote significance level at the 1%, 5%, and 10% significance level, respectively.

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