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Assessment of Post-merger Coordinated Effects: Characterization by Simulations

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Coordinated effects

Following a merger ….

"by changing the nature of competition in such a way that firms that previously were not coordinating their behaviour, are now **significantly more likely to coordinate** and raise prices or otherwise harm effective competition …

Motivation

- Merger control cases: more than 95% of notified mergers are approved (DG Comp stat.)
- Collusion is very harmful: average overprice of 24% for developing countries (Ivaldi et al 2013)

- Link between both:

"In contrast to the parallel unilateral effects literature, there is no consensus yet on how to measure the magnitude of coordinated effects". Brito et al. (2013)

Coordinated effects (Collective dominance)

- Three conditions for tacit coordination to be sustainable (ECMG 2004)
  1. The market must be transparent
     - A competitor can monitor the rivals' strategies
  2. Dominant companies can retaliate
     - A competitor can force a rival to comply to the implicit agreement
  3. No new competitor can jeopardize the collusive agreement

Examples:

- The CFI judgment on Airtours / First Choice merger
- The EC assessment of the Sony / BMG merger

Our definition

Condition for collusion on actualized payoffs

Collusion > Deviation + Competition

$$\frac{\Pi_i^C}{(1-\delta_i)} \geq \Pi_i^D + \frac{\delta_i \Pi_i^N}{(1-\delta_i)}$$

Critical discount factor (CRDF)

- The **lower bound** of discount factors that satisfy the collusion condition:

$$\delta_f^* = \frac{\Pi_f^D - \Pi_f^C}{\Pi_f^D - \Pi_f^N} = \text{CRDF}$$

The lower the CRDF, the higher the incentives to collude

Effect #1 of a merger

- The merged firm internalizes the cross-pricing externality

1. Higher prices under competition (Unilateral effects)
2. Less aggressive when undercutting collusive prices

$$\frac{\Pi_f^C}{(1-\delta)} \geq \Pi_f^D + \frac{\delta\Pi_f^N}{(1-\delta)}$$

Pro-collusive *Anti-collusive*

- Net effect = Change in Payoffs (CP) effect

Effect #2 of a merger

- Asymmetry in Payoffs (AP) effect
  - The incentive to collude is driven by the firm which has a larger weight in the payoff
  - the post-merger CRDF is closer to the one of the larger brand

The payoffs of the larger merging party have more weight on the post-merger decision to collude

Overall incentive to collude

OE = Asymmetry in Payoffs effect + Change in Payoffs effect

If CP = 0 i.e., the merger does not change the merging parties' payoffs

then OE = AP

METHODOLOGY

SIMULATION MODEL

- **Demand:**
  - Discrete choice with random coefficients
  - Two product characteristics: one continuous and one discrete
  - **Advantages:**
    - More realistic pattern of own and cross-price elasticities

SIMULATION MODEL

- **Supply:**
  - Firms compete in prices
  - Heterogeneous marginal costs and product characteristics
  - Model of repeated Bertrand competition

- **Calibrations:**
  - Replicate realistic values (or intervals)

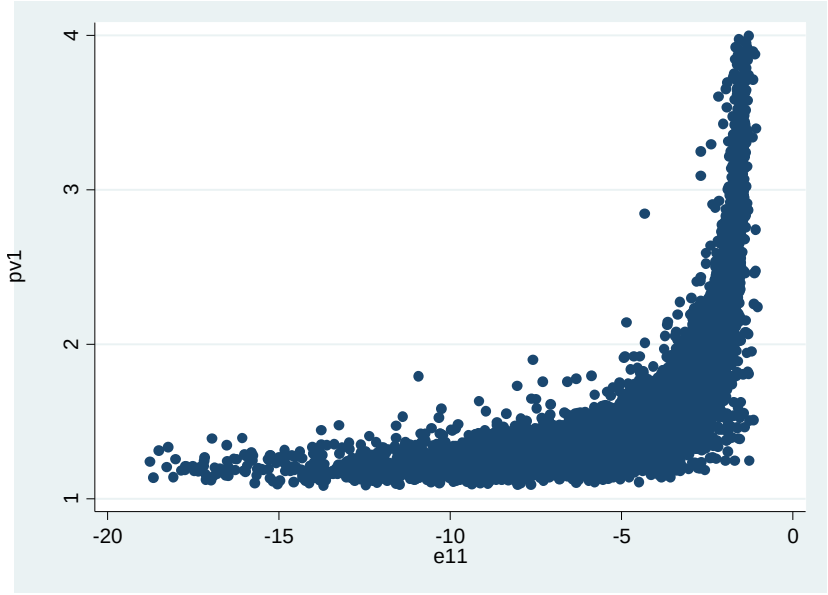
We simulate a large set of markets (36,000)

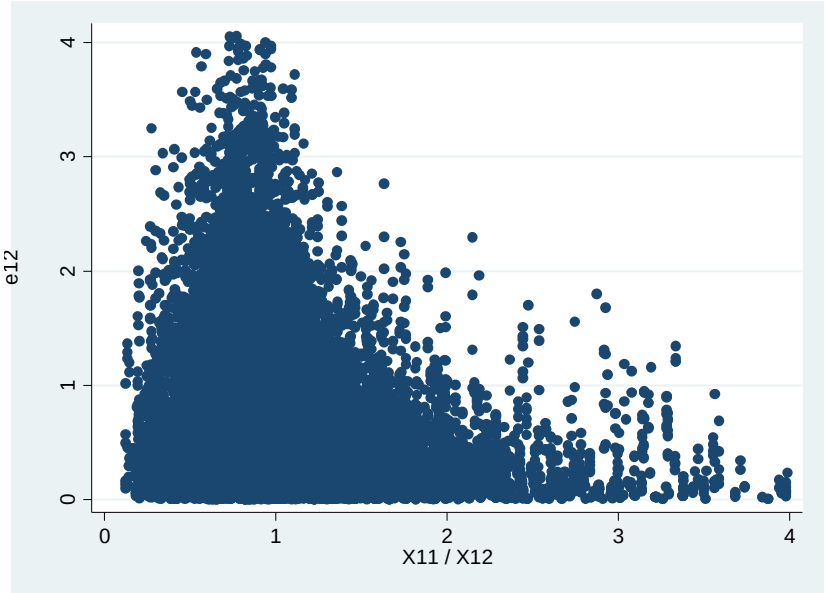
SIMULATIONS

1) Nature draws the underlying consumer preference parameters and cost components.
2) Nature draws the product characteristics.
3) Conditional on prices, firms can compute expected market shares.
4) The one-shot Nash equilibrium on prices is solved.
5) Consumers observe prices and product characteristics and make their choice.
6) In the case of collusion, steps 4) and 5) are repeated, but solving for the vector of prices that maximizes the joint-profits of firms.
7) In the case of deviation by firm i, steps 4) and 5) are repeated, the price that maximizes the expected profit of firm i is computed by taking other competitors' prices (set at the collusion level) as given.

SIMULATIONS

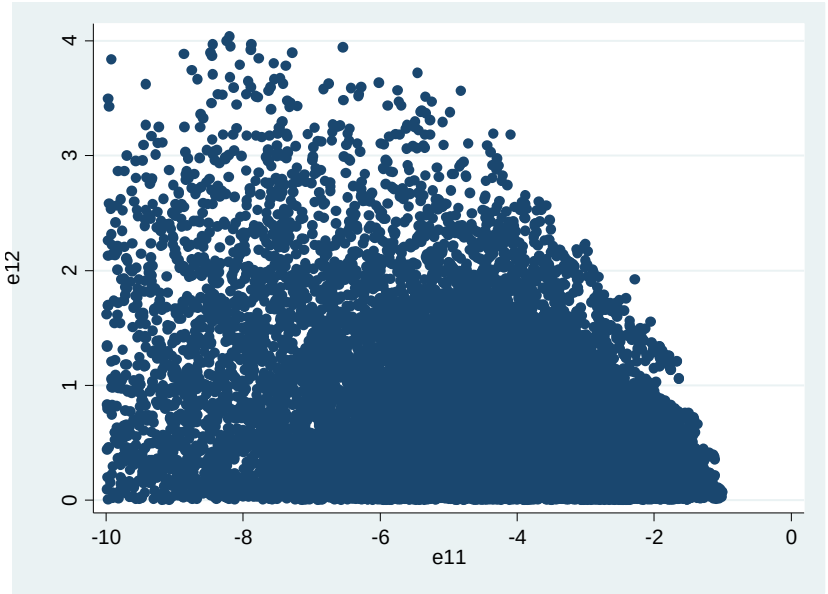
More realistic patterns of own and cross-price elasticities

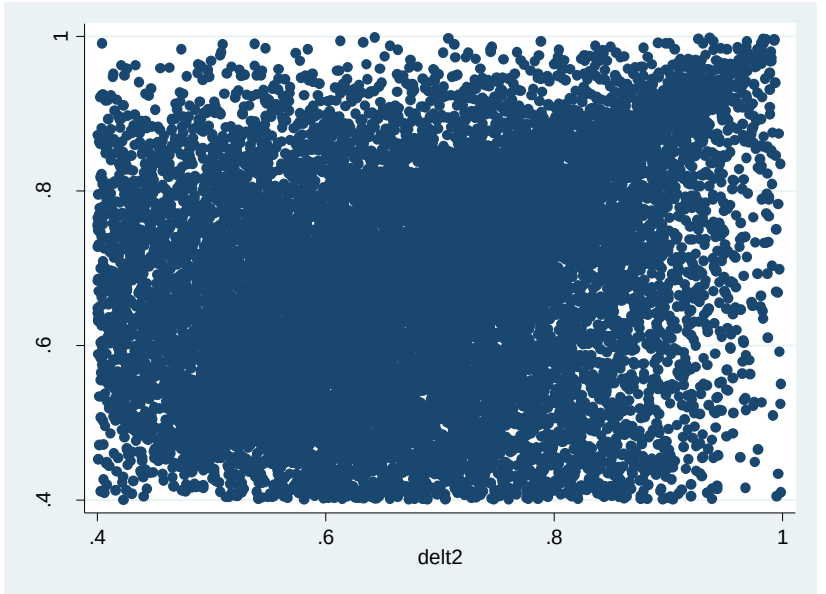




SIMULATIONS

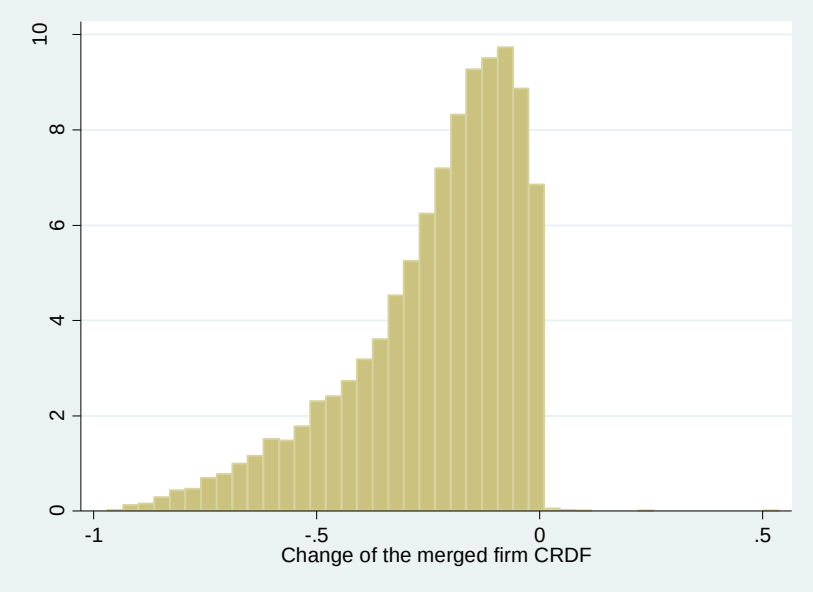
Heterogeneous economies

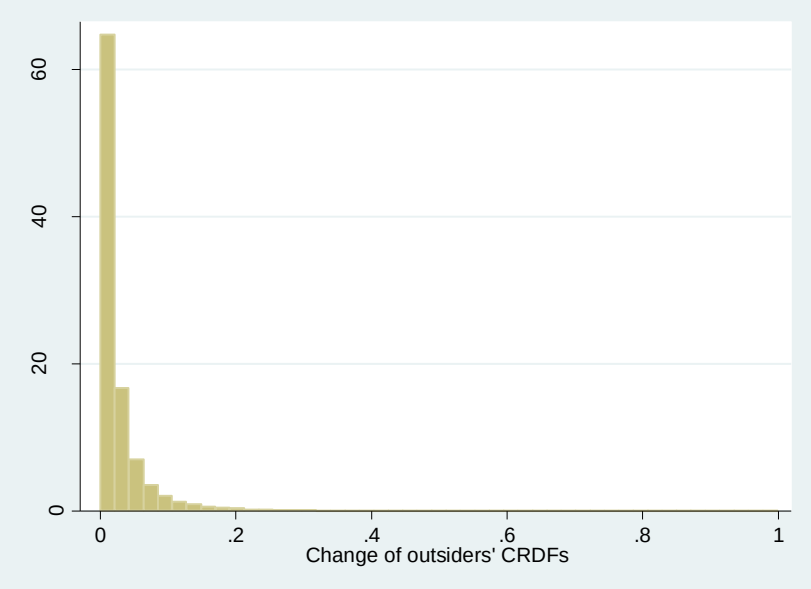




RESULTS

The magnitude of the impact of the merger on the CRDF of the merged firm is considerably higher than its impact on outsiders' CRDFs





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RESULTS

The merger works as a commitment device for the merged firm

- The merged firm has higher incentives to collude
- This result is driven by the fact that the impact of the merger on deviation payoffs predominates (i.e., higher than its impact on equilibrium payoffs)

Pro-collusive

RESULTS

Outsiders

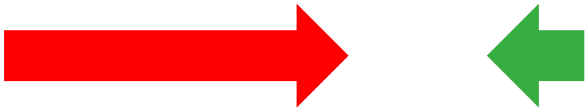
- Lower incentives to collude
- Because of higher payoffs under the punishment phase

Anti-collusive 

RESULTS

Comparison

- The magnitude of the impact of the merger on the CRDF of the merged firm is considerably higher than its impact on outsiders' CRDFs



SENSITIVITY

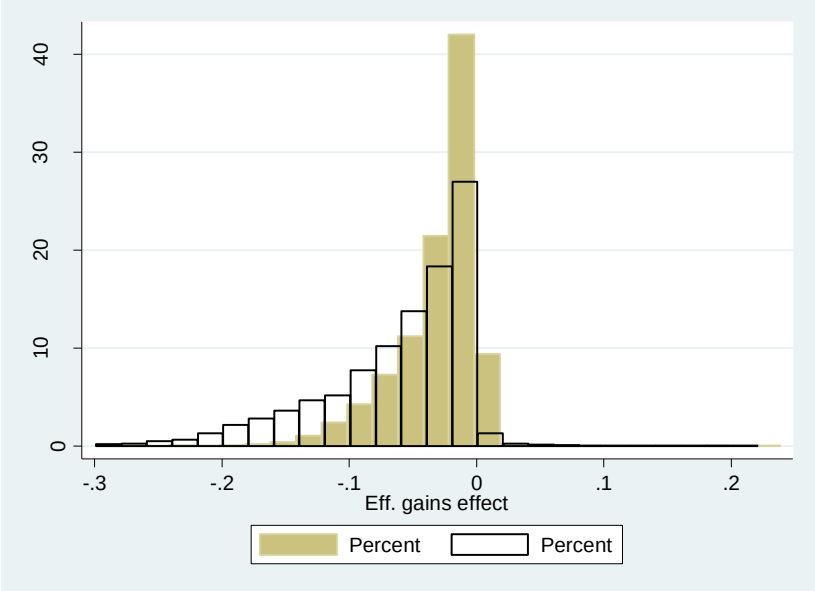
EFFICIENCY GAINS

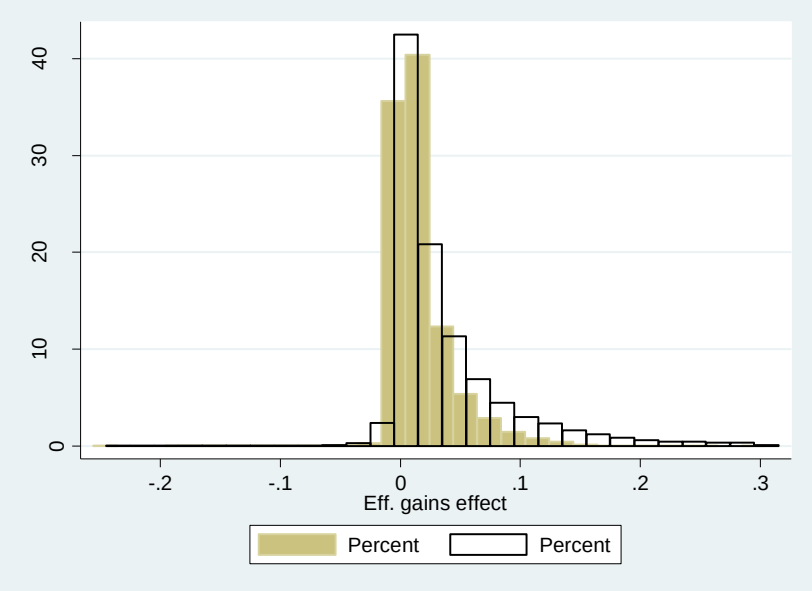
Exogenous shock

- Exact amount to mitigate unilateral effects
- Twice this amount

EFFICIENCY GAINS

The efficiency gains reinforce the impact of the merger





Pro-collusive

Anti-collusive

Merging firms

Outsiders

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EFFICIENCY GAINS

Merging parties are able to capture a higher fraction of the industry profits

$$\uparrow \frac{\Pi_f^C}{(1-\delta)} \geq \uparrow \Pi_f^D + \uparrow \frac{\delta\Pi_f^N}{(1-\delta)}$$

Pro-collusive *Anti-collusive*

Outsiders

$$\downarrow \frac{\Pi_f^C}{(1-\delta)} \geq \downarrow \Pi_f^D + \downarrow \frac{\delta\Pi_f^N}{(1-\delta)}$$

Anti-collusive *Pro-collusive*

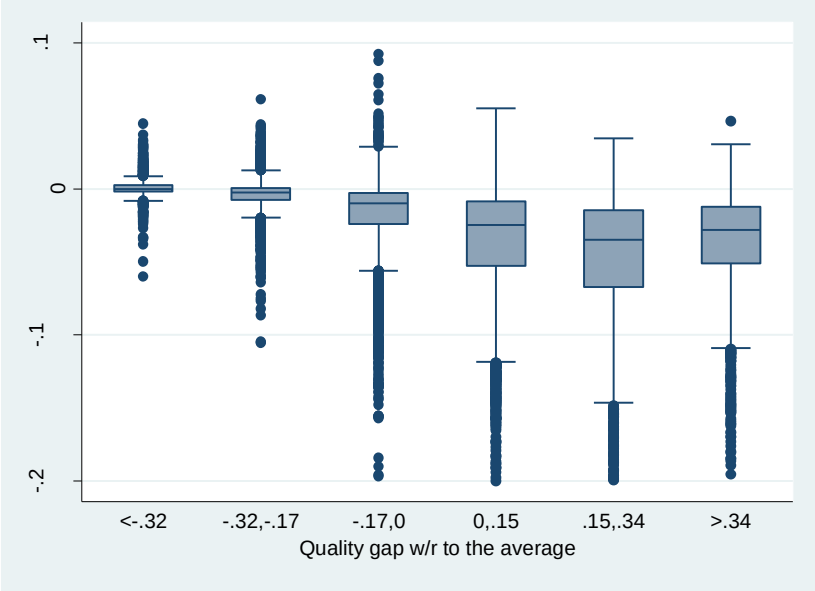
PRODUCT DIFFERENTIATION

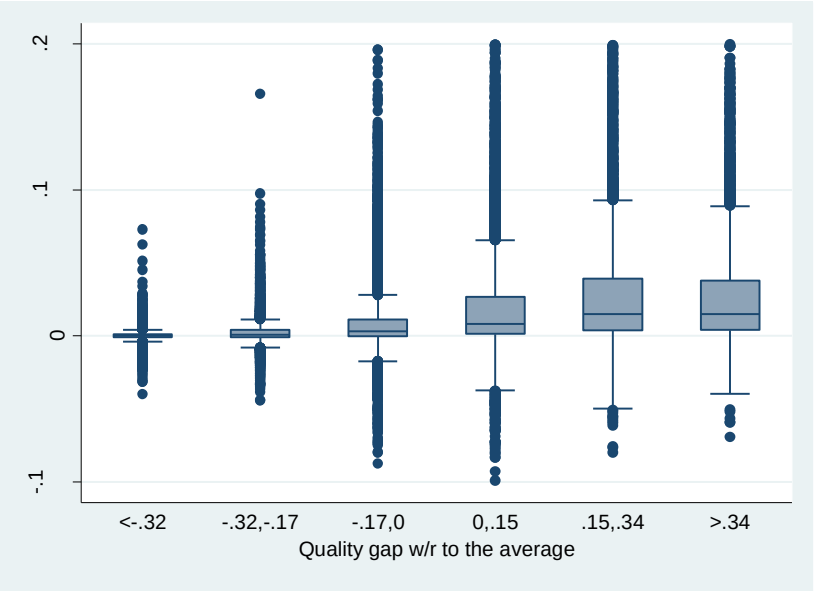
Exogenous shock

- Increase quality of one of the products produced by the merged firm

PRODUCT DIFFERENTIATION

Reinforce the impact of the merger, at least for a high-quality brand





Pro-collusive

Merging firms

Anti-collusive

Outsiders

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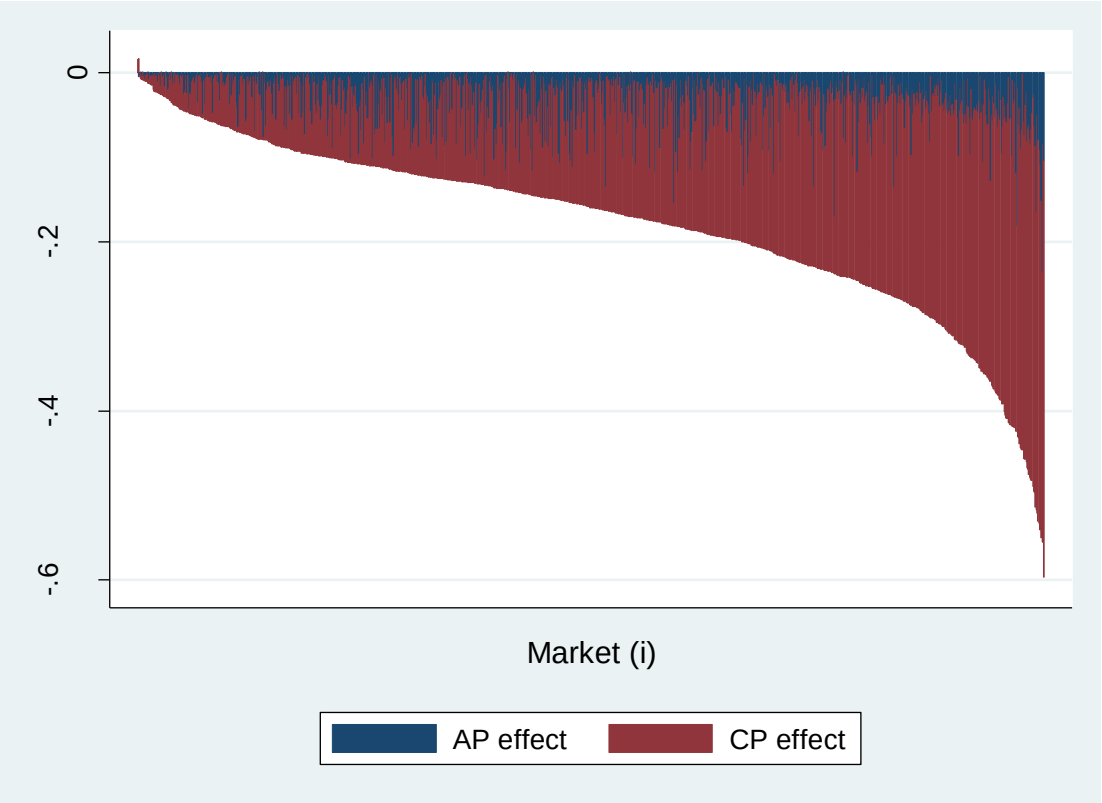
ASSESSMENT

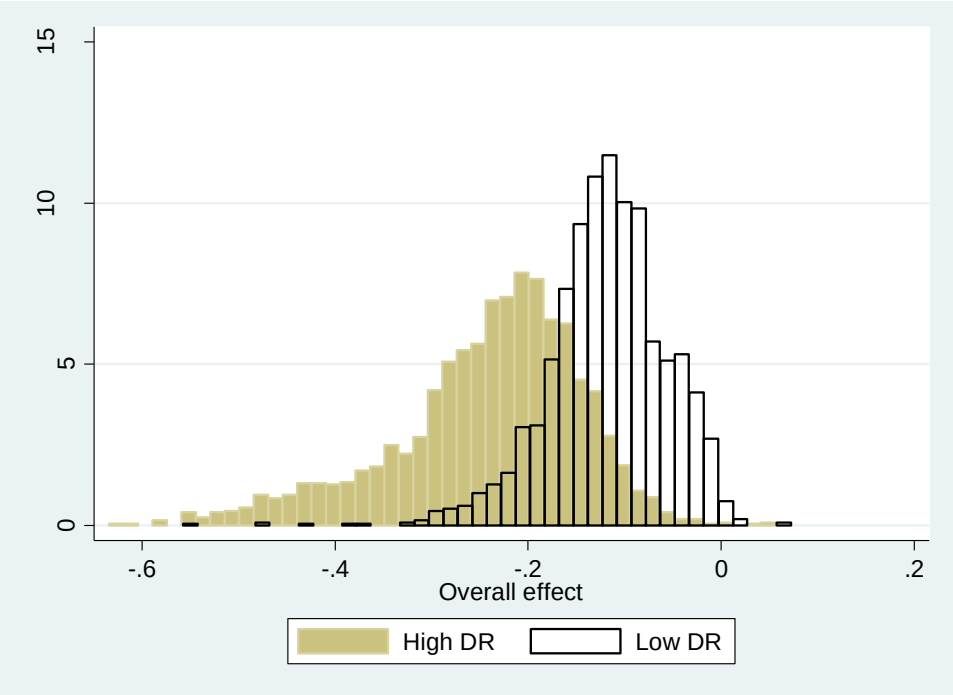
Symmetric firms

- The overall effect is driven by the CP effect



Symmetric firms

- **Screening tool candidate: diversion ratio** (i.e., percentage of sales that are divested from one brand to another as a result of a raise in prices)



Symmetric firms

- Mergers with higher diversion ratios have a stronger impact on the change in CRDF
- The risk of coordinated effects is higher for mergers with higher diversion ratios

Asymmetric firms

- The overall effect is driven by the AP effect
- The large firm "absorbs" the small one. Thus, the resulting CRDF is close to the one of the larger firm

Asymmetric firms

- Two cases

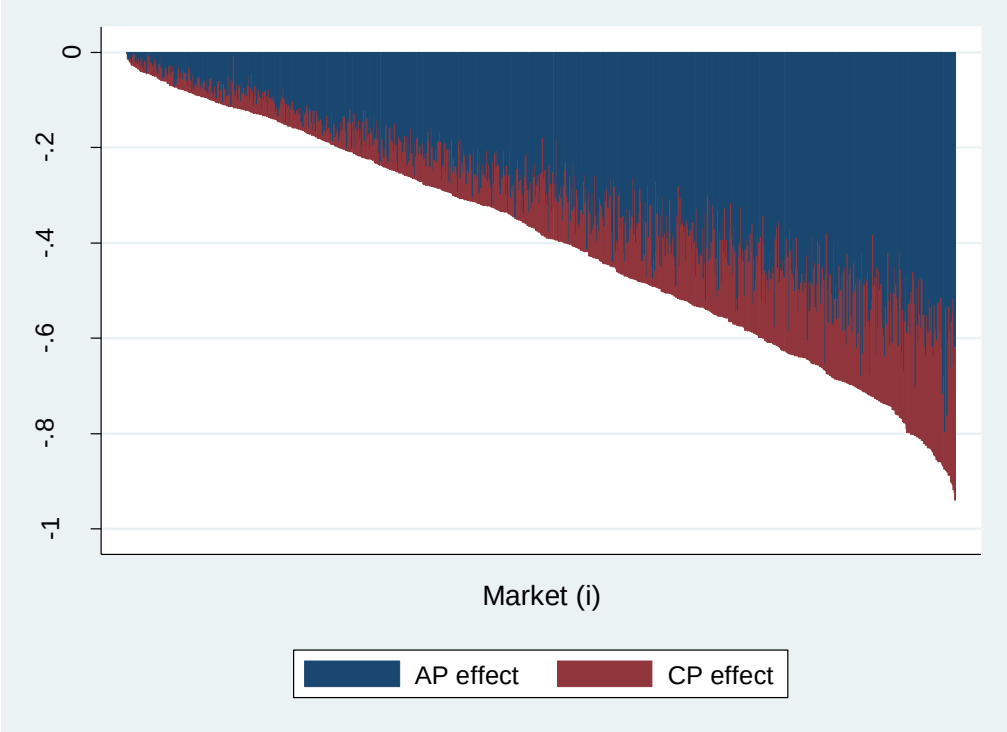
  a) **Larger firm has more incentives to collude**
  - **Lowest CRDF**
  - Most intuitive case, for instance, a large firm acquiring a maverick firm
  - Potential risk of coordinated effects

  b) **Larger firm has less incentives to collude**
  - **Highest CRDF**
  - Large established firm does not benefit much from collusion
  - No risk at all

Asymmetric firms

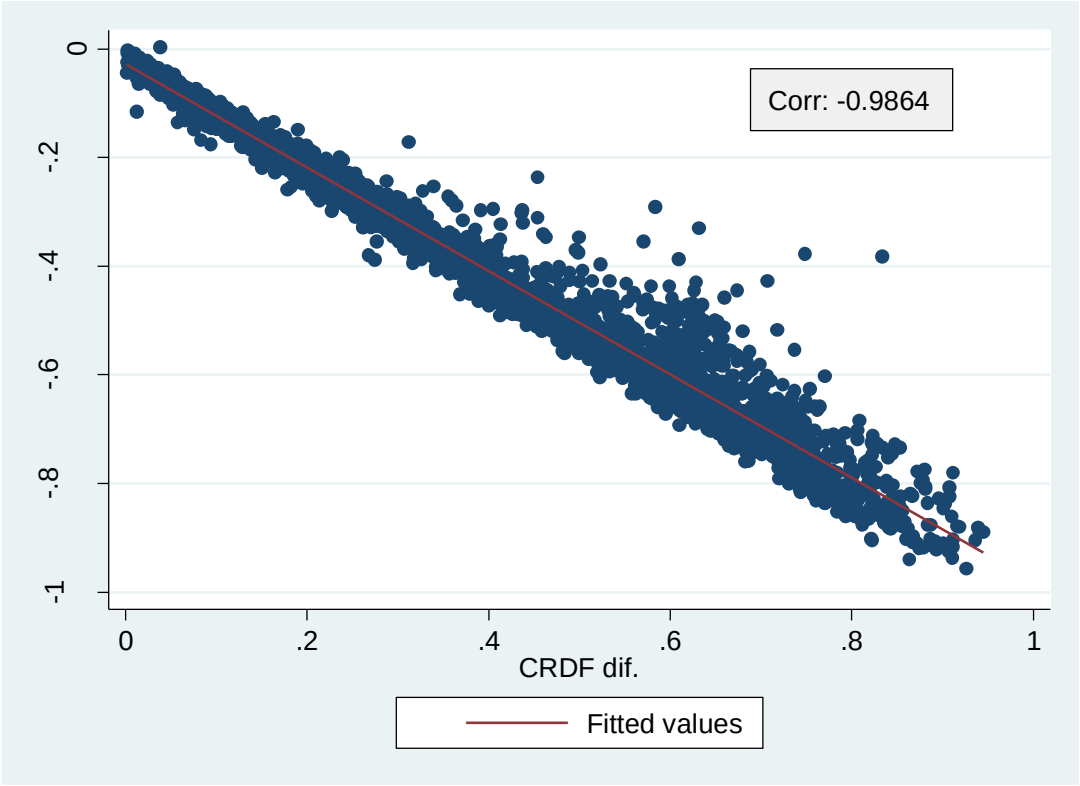
Case a)

- The overall effect is driven by the AP effect



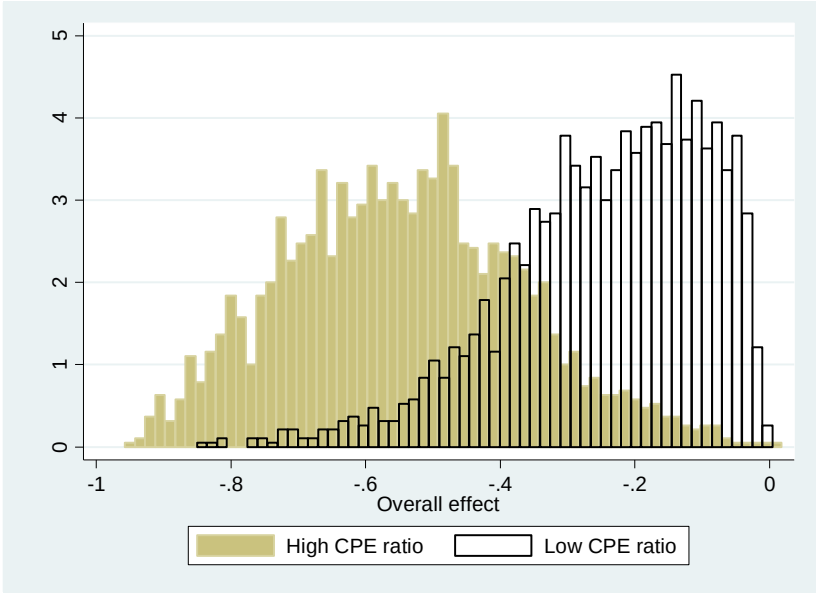
Asymmetric firms

- The overall effect is explained by the pre-merger asymmetry in terms of CRDFs

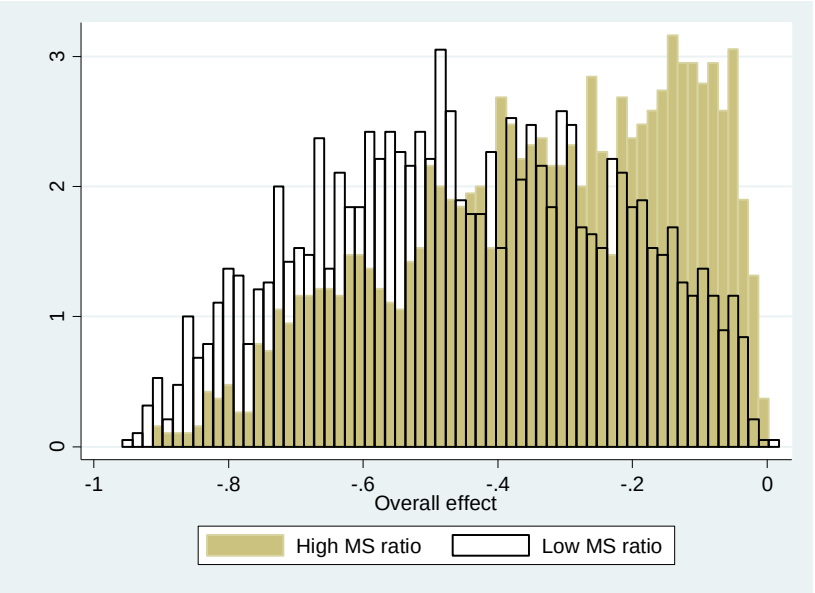


Asymmetric firms

- **Screening tool candidate: ratio of cross-price elasticities** (closely related to firms incentives to deviate from collusion)



Cross-price elasticities

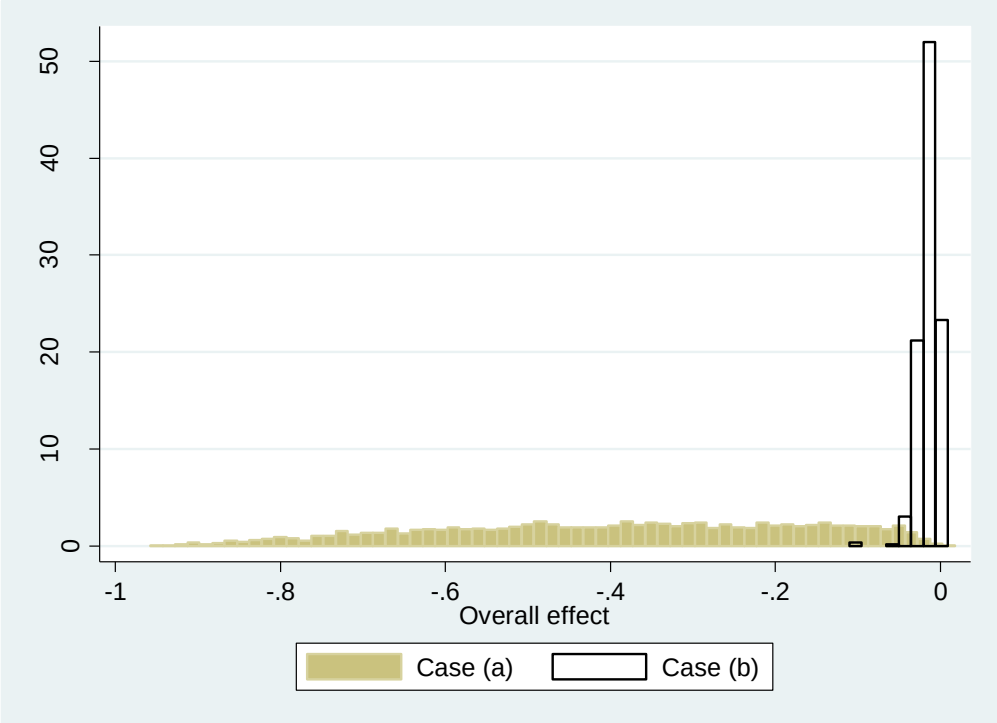


Market shares

Asymmetric firms

Case b)

- Null risk of coordinated effects



Asymmetric firms

- How to distinguish between cases a) and b)
  - If cross-price elasticity ratio is higher than one, the CRDF of the smaller firm is higher
  - If cross-price elasticity ratio is lower than one, the CRDF of the larger firm is higher

POLICY IMPLICATIONS

POLICY IMPLICATIONS

In general

- Stronger impact on insiders (similar to unilateral effects)
- In contrast to unilateral effect assessment, efficiency gains do not always mitigate risks
- The merger either increases or decreases the market asymmetry in terms of CRDFs
- Only mergers that make the market more symmetric are risky
  - The acquisition of a maverick (asymmetric merger type (a))
  - A merger between two mavericks (symmetric firms)

POLICY IMPLICATIONS

In terms of magnitudes

- When a large firm acquires a maverick, use screening based on cross-price elasticities
- When two symmetric firms merger use a screening based on diversion ratios

Future research

Limitations

- We can only draw "qualitative" conclusions!

  Empirical work is needed in order to obtain quantitative results. Interesting venue for future research

- We only focus on one collusion equilibrium (i.e., joint-profit maximization)

  Allow for different strategies, for instance: parallel accommodating conduct (Moresi et al. (2011 and 2015), or alternatively, balanced temptation equilibria (Sabbatini (2015)).

  Ivaldi and Lagos (2015), "Parallel Accommodating conduct: Evaluating the Performance of the CPPI index", Working Paper