HEINRICH HEINE
UNIVERSITÄT DÜSSELDORF

Düsseldorf Institute
for Competition Economics

A Decade of Ex-post Merger Policy Evaluations: A Progress Report

Tomaso Duso
Düsseldorf Institute for Competition Economics – DICE

The Pros and Cons of Merger Control
November 9, 2012

Introduction

- No conclusive evidence on whether merger control is socially beneficial (e.g. Crandall and Winston, JEP 2003; and Baker, JEP 2003 and Werden, JEP 2003)
- To assess merger control is perhaps even more important since it has large implications for all other areas of antitrust (Kovacic, 2009)
- Most of the major antitrust jurisdictions attempted to conduct in house ex-post studies or commissioned them to advisors
- Several academic contributions have appeared in the past decade
  - Case-by-case specific analysis
  - Broader analysis of the enforcement in a jurisdiction over a long time period
  - Long term effects in terms of deterrence of particular merger behaviors
- Various approaches have been employed: i) the estimation of structural econometric models & simulations, ii) diff-in-diff analysis, iii) event studies, and iv) surveys/case studies

Introduction – Evaluation Framework

- Goal of the paper: Overview of my own research and partial review of ex-post evaluation studies
- Structured on the framework developed by Duso, Gugler, and Szücs (2012):
  1) Ex-ante: Predictability / legal certainty
  2) 'In fieri' : Correctness of the decisions
  3) Ex-post: Deterrence
- Two key concepts are at the basis of any ex-post evaluation
  - Choice of a counterfactual: theoretically derived (simulations), a 'similar market' (diff-in-diff), the stock market (event studies), the opinion of a relevant group of actors (surveys)
  - Level of aggregation: i) micro, single-merger view, ii) a cross-mergers, cross-industry analysis, iii) more macro approach that looks at the policy impact on various dimensions of economic activity

2.1 Correctness of the Decision – Event studies

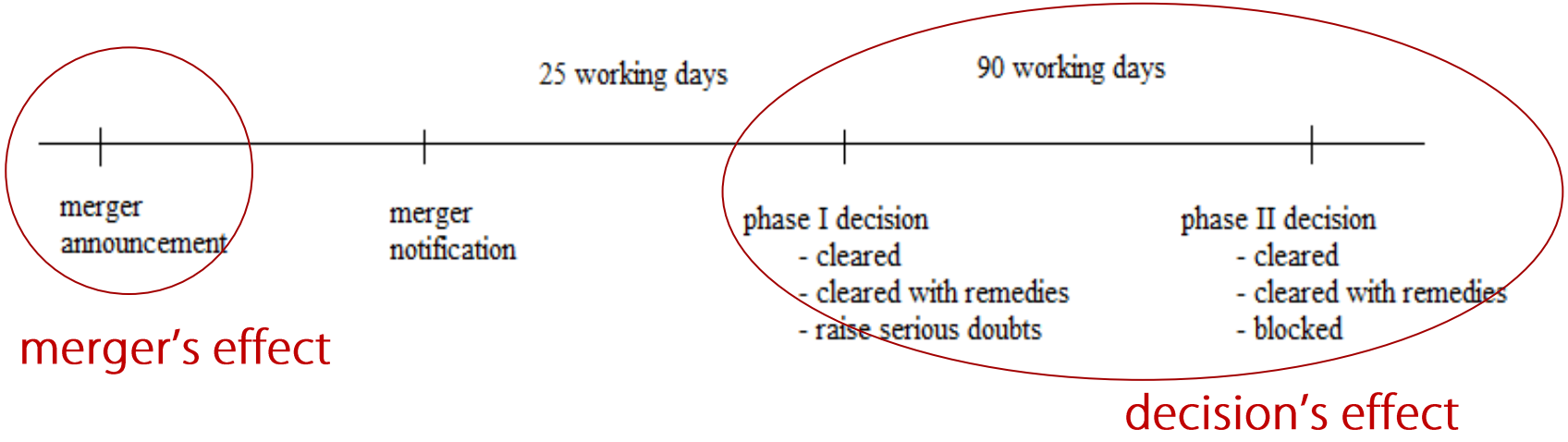
- Our use of event studies (Duso, Neven, and Röller, JLE 2007) is based on two main elements
  - Theoretical assumptions from standard merger theory in an static oligopolistic setting (e.g. Farrell and Shapiro, AER 1990): definition of anti-competitive mergers
  - The use of stock-market event studies to measure the effect of mergers and merger control decisions (e.g. Eckbo, JFE, 1983; Aktas et al., EJ 2007; Duso et al., JLE 2007; Duso et al. EER, 2011)
- We apply this approach to different samples of mergers scrutinized by DG Comp of the European Commission between 1990 - 2007

Theoretical Identification

- We define an anti-competitive merger as one that reduces consumer welfare (consumer surplus standard)
- Mergers exert two externalities on rivals: one positive (the market power effect) and one negative (the efficiency effect)
  - In most mergers both effects co-exist and what matters for welfare is the net effect of these antipodal forces
  - When the positive externalities exceed the negative externalities, i.e. the efficiency gains are not enough to compensate for the market power effect, rivals' profits increase, while consumer surplus decreases (Farrell and Shapiro, AER 1990)
- This identification (a merger is prevalently anti-competitive if rivals profits increase after the merger) is quite general and robust and holds for standard oligopoly models of horizontal mergers

Empirical Measurement

- We use information from the financial markets to measure the profitability of a merger and the Commission's decision (e.g. Eckbo, JFE 1983; Aktas et al. EJ 2007; Duso, Neven, Röller, JLE, 2007)
- The event study methodology looks at how stock prices of firms involved in the merger (merging firms and rivals) react to a particular event (e.g. merger announcement, commission's decision etc.)
  - Abnormal returns: the exceptional returns (compared to the market) that a firm realizes around a particular event



Empirical Measurement

- Competitors should be precisely identified. We use the accurate market definition performed by DG Comp
- We use the first merger-specific rumors to more precisely identify the event
- We use large event windows to control for the uncertainty in the allocation of the roles (acquirer, target, rival)
  - (50, 5) for the announcement and phase II decision
  - (20, 5) for the phase I decision
- These long-window CAARs significantly correlate with other estimates of the mergers effects based on accounting data (Duso, Gugler, Yurtoglu, IRLE 2011)
- We correct for market's prior about the antitrust action by estimating the probability of an action as a function of observable mergers' characteristics
- Use of a large cross-section of cases: consistently identify relevant tendencies

Data

- 355 mergers analyzed by the EU Commission between 1990 and 2007. The final sample contains 1,771 firms (522 merging parties and 1,249 competitors)
- Almost all Phase II cases (115) and a random sample of Phase I cases (240)
- Sources:
  - EU decisions (firms' identities, Commission's decisions and merger-specific information)
  - Dow Jones Interactive (announcement date)
  - Datastream (stock market returns)

Discrepancies – Type I and Type II errors

- Intervene if CS is reduced → rivals' profits increase → rival's CAARs>0
- We compare the actual decision to the stock market's prediction

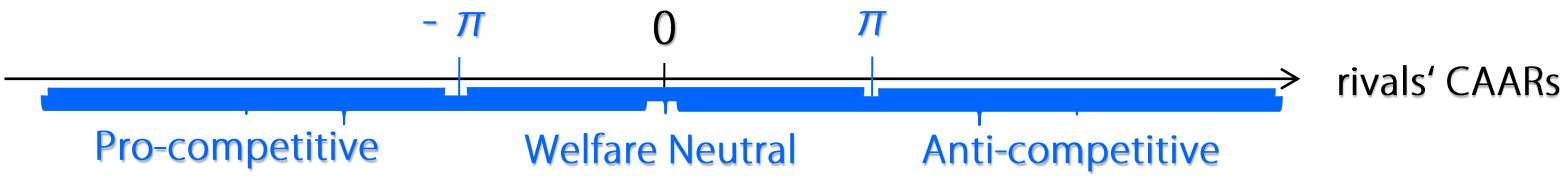
	Phase 1		Phase 2			
	6.1.b	6.1.b remedies	8.1.	8.2. remedies	8.3.	Tot.
Anti-competitive (Rivals' CAARs>0)	85	33	17	35	9	179
Pro-competitive (Rivals' CAARs<0)	92	30	12	38	4	176
Total	177	63	29	73	13	355

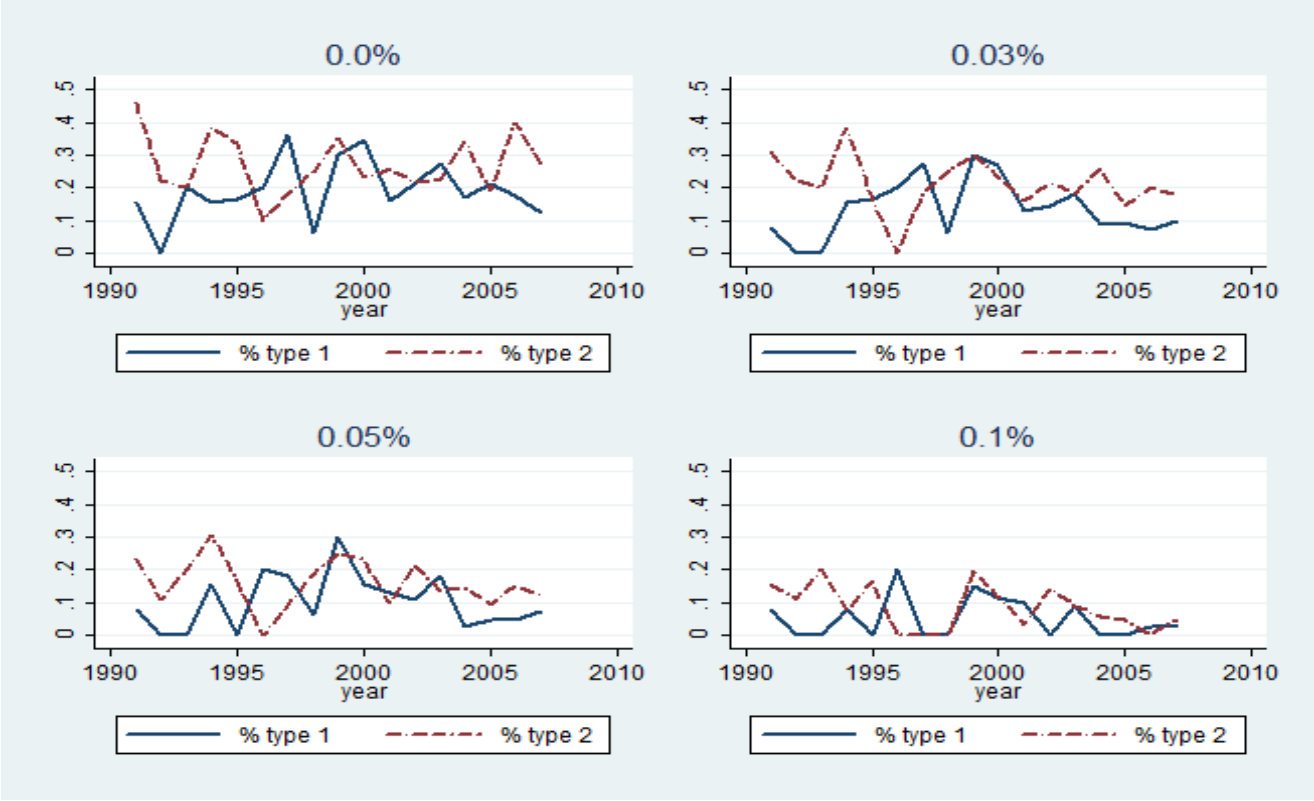
Source: Duso, Gugler, Szücs (2012)

Possible Type II errors

Possible Type I errors

Type I and Type II errors





The determinants of Type I and Type II errors

- Descriptive:
  - The frequency of type I errors is significantly reduced after 2004
  - Even more so for largely pro-competitive mergers
  - No clear time patter for type II errors
- Estimate proclivity of type I and type II errors as a function of observables: systematic sources of errors/discrepancies?
  - Type I errors are more likely in phase 1, when the market is narrowly defined and when barrier to entry are assessed to be high. They are less likely if an US firm is involved (politics?)
  - Type II errors are less likely in phase 2 and more likely when US firms are involved. Some mild form of firms' influence (likelihood is significantly higher the higher the merger's profitability)

Rent-Reversion

- At the decision date, there should be a **reversion of the (anti-competitive) rents** measured around the merger announcement due to the decision, if the antitrust action is effective (Duso, Gugler, Yurtoglu EER 2011)
- **Prohibitions** completely revert the rents observed at the merger announcement (test of the EMH)!
- **Remedies** only partially revert the rents → much heterogeneity. Remedies are more 'effective':
  - When the anticompetitive concerns are **not too severe**,
  - When applied in **phase 1** (e.g. DG Comp, 2005)
  - When applied in **remedies intensive industries** (EC learn?)

2.2 Correctness of the decision – Diff-in-Diff

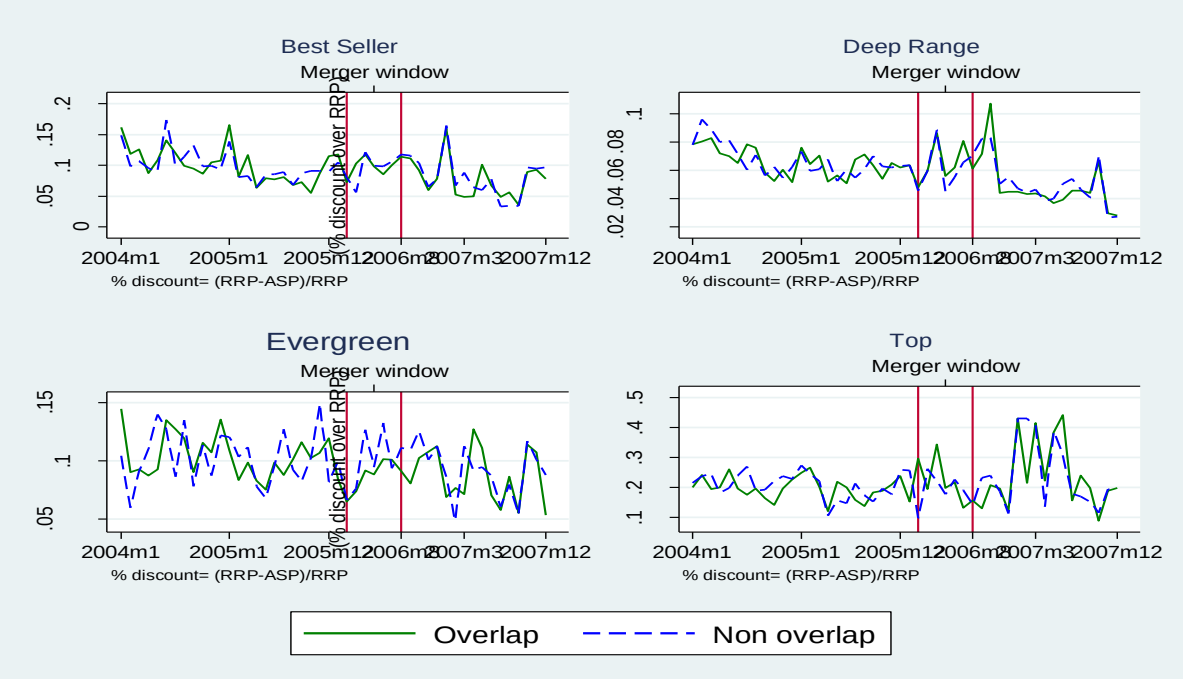
- Ideally, the most appealing approach for an ex-post evaluations
- Heavily used in many other policy fields and recently also in merger evaluation (Angrist and Pischke, JEP2010)
- Very natural, simple, 'a-theoretical', data-driven approach
  - Consider two similar groups (twins) of firms/markets: one has been 'treated' by the merger, while the other is used as a control group (first difference)
  - Compare how they developed before and after the merger (second difference)
  - The difference-in-difference behavior measure the merger effect
- The definition of the counterfactual is crucial (Whinston and Nevo, JEP2010)
- It can be used for the analysis of a single (some) merger(s) but not to study the entire policy over a period of time

The Waterstone-Ottakar Merger

- We analyze the merger among two major book resellers in the UK Waterstone's and Ottakar's (Aguzzoni et al., 2012)
  - It was cleared by the UK Competition Commission (CC) in 2006
  - The book retailing product market is characterized by locally differentiated sub-markets/areas which are differently affected by the merger
  - We use this geographical variation to identify 'treated' and 'control' areas (e.g. Hastings AER 2004)
  - We choose 60 stores (30 Waterstone's and 30 Ottakar's) in 50 areas (30 overlap and 20 non-overlap areas)
  - Monthly data on volumes and values of a sample of 200 titles in four groups: top-seller, evergreen, best-seller, deep-range
  - Quite data intensive (and expensive!)

The Waterstone-Ottakar Merger

- No significant price increase in the overlapping areas



- No significant effect of the merger on national prices (compared to competitors or to the most 'competitive' segment)

2.3 Correctness of the decision – Simulations

- Very useful and powerful ex-ante instrument to assess mergers effects and increasingly used in actual merger control enforcement in recent years
  - Consider a full model of market competition with differentiated goods and Bertrand-Nash competition
  - Estimate key parameters: demand elasticities and marginal costs
  - Simulate different scenarios based on the assumed model and estimated parameters
- Not clear how to use them in ex-post evaluations:
  - Simulate alternative outcomes: other remedies
  - Possibly use ex-post data to estimate key parameters (e.g. marginal cost) and make before-and-after comparison
- Recent studies verify how accurate merger simulations can predict 'actual outcomes' as measured by means of diff-in-diff exercises

3. Ex-Ante: Predictability

- Competition authorities see transparency and **predictability** as central issues to create **legal certainty**
- The role of ex-post studies might be crucial
  - Categorization, **organized collection**, and evaluation of relevant data on enforcement decisions can help to make more precise predictions on the likelihood of certain outcomes
- Estimate **probability of intervention** (P_j) as a function of observables (X_j)
- We differentiate among two kinds of models:
  - *Ex-ante* model: solely based on variables which are observable and measurable before the decision has been taken
  - *Investigation* model which instead additionally makes use of the information which is made available during the investigation (similar to previous studies e.g. Bergman et al., IJIO 2005)

Predictability: Results

- Even the simplest ex-ante model is able to correctly predict the intervention outcome with over 70% probability
  - Mergers involving US firms and cross-border mergers: significantly less likely to be challenged
  - Full mergers, conglomerate mergers, and mergers where the involved parties have high market values more likely to receive scrutiny
  - A high working load for the EC as measured by the number of lagged notifications decreases the number of intervention post-reform
- Adding the investigation variables increases the percentage of correct predictions to over 90%
  - The likelihood of intervention significantly increases with the existence of barriers to entry and a dominant firm and a narrow market definition

4. EX-post: Deterrence

- Optimal merger policy also involves **deterrence**: some actions, which in isolation would be welfare detrimental, might be optimally taken to deter future anticompetitive mergers (Sørgard, JIndE 2010)
- We look at how **past decisions** affects the probability of a particular merger to be **anti-competitive**, **welfare neutral**, or **pro-competitive** (e.g. Seldeslachts et al. JLE, 2009) – ordered probit
- We use the definition discussed above
- We combine with our data measures of DG Comp's **merger policy from the population** of over 4,000 mergers scrutinized in the sample period
  - **Prohibitions deter** (pre-reform)
  - **Withdrawals** and **phase 1 remedies** deter (post-reform)
  - **No over-deterrence** due to policy enforcement

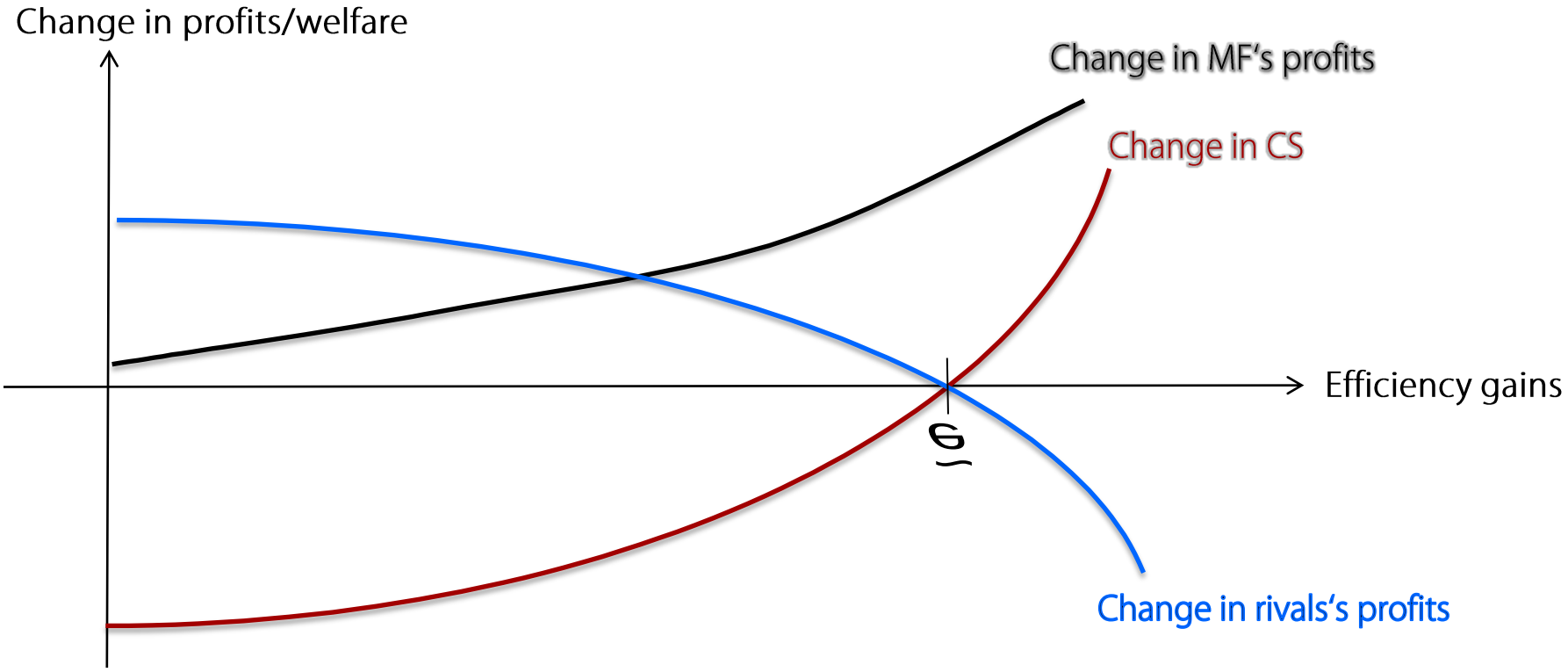
Conclusions

- Our framework tries to encompass three fundamental phases of effectiveness evaluation: i) ex-ante predictability, ii) in-fieri correctness, iii) ex-post deterrence
- Event studies, Diff-in-Diff approach, and (partially) simulations coupled with structural demand estimation can be useful for analyzing the second phase
  - These methods can be used to answer different questions: single merger vs. whole policy
  - Only the convergence of different results based on different methods and data can give confidence of their reliability
- The study of predictability and deterrence are less developed but very important to understand merger policy in its whole

What can be done

- Competition authorities
  - Increase transparency and accountability by regularly collecting and categorize information about their policy enforcement
- Researchers (economists)
  - Push forward the methodological frontier and provide robust tools
  - Be clear, transparent, and explicative
  - Keep contact with the policy enforcers (and legal scholars); simplify but don't loose the sense for the importance of details
- (Some) Possible avenues of research
  - Relationship between different areas of competition policy (Buccirossi et al. 2012)
  - The interplay between competition authorities and courts (and possibly other institutions) is fundamental (Buccirossi et al. 2012)
  - Relationship and convergence among the decisions of different agencies is an increasingly important issue in a globalized world (Szücs, 2012)
  - Assessment of efficiencies (static but especially dynamic) is a crucial but under-researched topic (Röller, 2009)

Theoretical Identification



The first identifying assumption of our framework is that a **post-merger increase in competitors' profits is an indication of the merger being anti-competitive ($D_j=1$)**