

# Empirical Analysis for Competition Policy: Towards a Unified Framework

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# CONTENT

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## 1. MOTIVATIONS

## 2. A GENERIC EXAMPLE

## 3. A MERGER CASE

The Lagardère/Natexis/VUP case

## 4. A STATE AID PROBLEM

A test for detecting anticompetitive subsidy

# CONTENT

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## 1. MOTIVATIONS

2. A GENERIC EXAMPLE

3. A MERGER CASE

4. A STATE AID PROBLEM

# Context

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- Fields of European Competition Policy
  - Antitrust
    - ◆ Agreements / alliances
    - ◆ Cartels / Dominant firms
  - Merger control
  - State aid
  - International activities
    - ◆ Enlargement
    - ◆ WTO

# Context

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- Fields of European Competition Policy
- Four domains for empirical analysis
  - Relevant market
  - Merger
  - Cartel
  - State Aid
  
- (International markets)

# Claim

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- Fields of European Competition Policy
- Four domains for empirical analysis
- **One** solution
  - To use the differentiated-products market framework
  - **To measure changes in market power**

# The case for empirical analysis

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- Relevant market
  - Hausman (1996)
  - Price discrimination and market test

# The case for empirical analysis

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- Principle of market test (SSNIP)
  - A hypothetical monopoly
  - Small increase in price (5%)
    - ◆ Leakage: Some customers switch for other products
    - ◆ Profit loss
  - The market is too small
- Profitability of price increase
  - Ratio of price to marginal cost
  - Structure of demand
    - ◆ Knowledge of different segments/customers
    - ◆ Capacity of price discrimination

# The case for empirical analysis

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## ■ Merger

### ● Context

- ◆ High risk to authorize **anti**competitive mergers
- ◆ Low risk to prohibe **pro**competitive mergers

# The case for empirical analysis

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## ■ Merger

### ● Sources of errors

#### ◆ Political economics

- Investigation capacity
- One body: investigation and decision
- Role of third parties (small members, ...)

#### ◆ Economics

- Priority to the measure of dominance
  - A tropism refuted by economic theory
- Weak account of efficiency gains
  - Measurement: remarkably absent

# The case for empirical analysis

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## ■ Merger

### ● Theory

#### ◆ Williamson (1968)

- Market power versus efficiency
- A **small** reduction in average costs could be offset **only** by a **large** increase in prices
  - Evaluation of elasticities and marginal costs

#### ◆ Davidson & Deneckere (1985)

- In differentiated-products Bertrand models mergers yields price rises
  - The higher the diversion ratio, the higher the price increases
    - Importance of the structure of preferences
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# The case for empirical analysis

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- Relevant market
- Merger
- Cartel
  - Detecting tacit collusion
  - Leniency programmes
    - ◆ Determination of fines
- State aid
  - Detecting anticompetitive subsidies

# Conclusion

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- Empirical analysis is needed
  - To enlight the critical assumptions and factors
  - To improve the accuracy of competitive analysis by putting numbers on the issues
  - To provide a persuasive set of arguments by making them more concrete and better grounded on facts and theory

# CONTENT

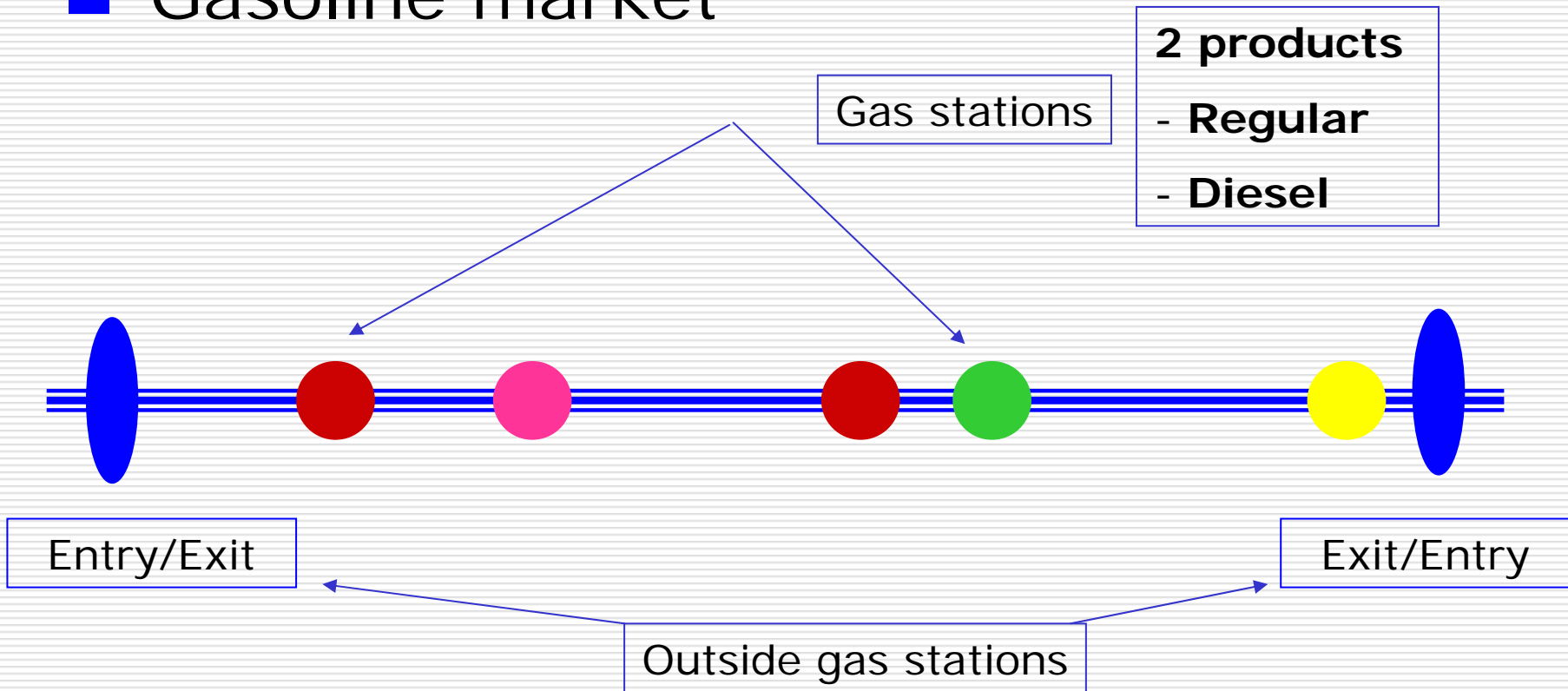
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1. MOTIVATIONS
- 2. A GENERIC EXAMPLE**
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# Example

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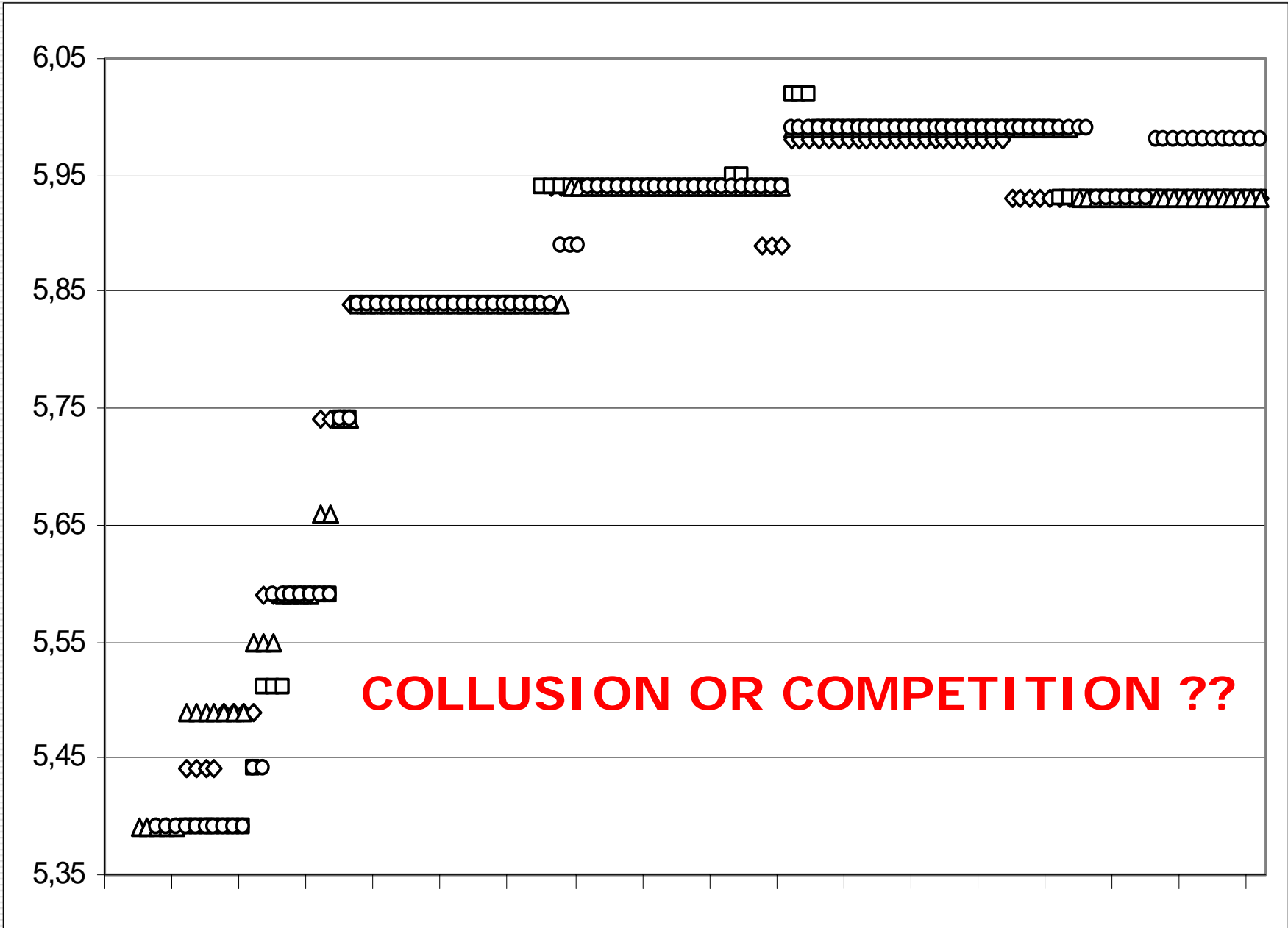
## ■ Gasoline market



# Example: Questions

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- Relevant market?
- Competition vs Collusion?
- Effect of a merger?
  
- N.B.: Resemblance with any real case is purely accidental



# Example: Ingredients

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- Demand model
  - To explain how quantities sold change with
    - ◆ Prices
    - ◆ Quality (location of stations)
    - ◆ Market size
- Cost model
  - To approximate marginal costs as function of
    - ◆ Output quantities
- Pricing equations
  - To explain how prices are chosen according to
    - ◆ Firms' conduct
      - Bertrand competition
      - Tacit collusion

# Example: Main steps

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## ■ Model

- Demand, Cost, Pricing

## ■ Steps

- Estimation / calibration of an economic model
  - ◆ Measurement of model parameters
- Comparison of equilibria
  - ◆ Collusion versus competition
- Counterfactual experiments

# Example: Model

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- Demand: logit model

$$\ln(s_{af}) - \ln(s_{0f}) = x_{af}\beta - \alpha p_{af} + \xi_{af}$$

- Market share of gasoline of type  $f$  in station  $a$ 
  - ◆ Roughly estimated
- Market share of gasoline of type  $f$  in station  $0$ 
  - ◆ Evaluation of the market size  $N$
- Quality effect / price effect
  - ◆ Location: distances to the next stations
  - ◆ Effect of the day of the week
  - ◆ Effect of the brand
  - ◆ Price of oil on the international market
- Price of gasoline of type  $f$  in station  $a$
- Error term

# Example: Model

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## ■ Demand: logit model

$$\ln(s_{af}) - \ln(s_{0f}) = (x_{af}\beta + \xi_{af}) - \alpha p_{af}$$

- The ratio of the market share of gasoline  $f$  sold in station  $a$  as a percentage of the market share of gasoline  $f$  sold in the outside station is determined by comparing
  - ◆ Quality
  - ◆ Price weighted by an exchange rate (the marginal utility of income)

# Example: Model

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## ■ Pricing

- Bertrand competition
  - ◆ For each station  $a$  and each gasoline  $f$
  - ◆ The margin is proportional to the share of the station on the market of this gas

$$p_{af} - c_{af} = \frac{1}{\alpha(1 - s_{af})}$$

# Example: Model

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## ■ Pricing

- Collusion (Monopoly)
  - ◆ For each station and each gas
  - ◆ The margin is inversely proportional to the share of the outside station

$$p_{af} - c_{af} = \frac{1}{\alpha s_{0f}}$$

# Estimation / Calibration of the Model

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- Statistical methods or calibration
  - Remark
    - ◆ Differences in the estimation of marginal costs
- Test Competition vs Collusion
  - Available statistical tests
    - ◆ Davidson-MacKinnon type test
    - ◆ Vuong type test
  - Remark
    - ◆ Other possible equilibria

# Example: Simulation

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- Simulation of mergers
  - Notified mergers: Stations  $a$  and  $b$ 
    - ◆ Simulate the new Bertrand equilibrium
    - ◆ Measurement of unilateral effects / market power

Non merging firms

$$\tilde{p}_{af} - \tilde{c}_{af} = \frac{1}{\alpha(1 - \tilde{s}_{af})}$$

Merging firms

$$\tilde{p}_{af} - \tilde{c}_{af} = \frac{1}{\alpha(1 - \tilde{s}_{af} - \tilde{s}_{bf})}$$

# Conclusion

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- Empirical analysis
  - Implementable in a relatively simple framework
  - Data sets are available?
- Questions
  - Realistic?
  - Robust?

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# Lagardère/Natexis/VUP merger

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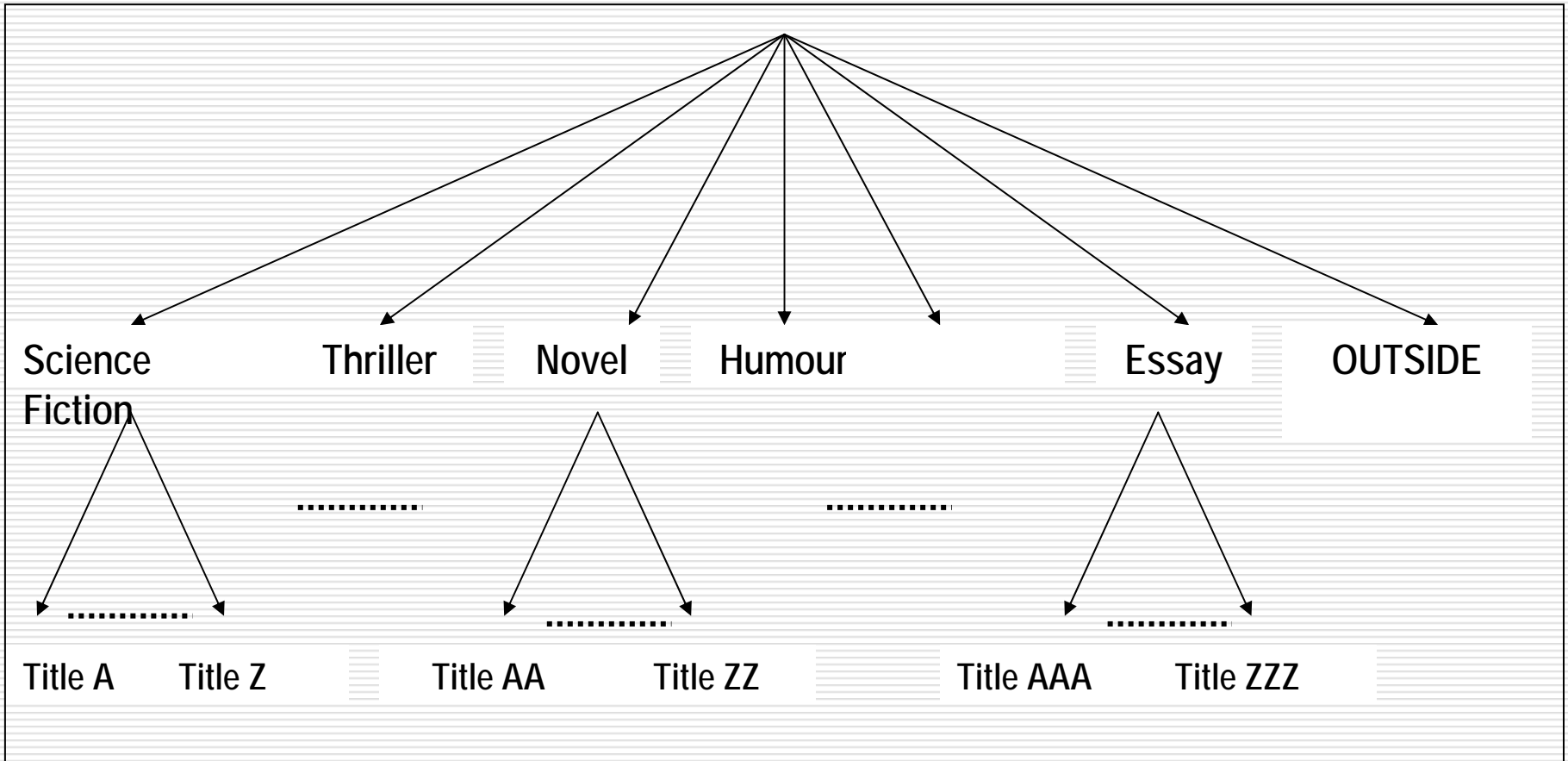
- A leading European merger in 2003
- A merger in the (French written) book industry
  - Oligopoly: Several groups of publishers
    - ◆ Lagardère (Hachette): Grasset, Stock, Livre de Poche, ...
    - ◆ VUP: Pocket, Laffont, Fleuve Noir, ...
  - Horizontal and vertical issues
- Econometric evaluation of unilateral effects

# The econometric study

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- Data from IPSOS in 2002
  - Hardcover (top 1500) and paperback (top 5000)
  - Volume, price, pages, author for each title
  - Number of products
    - ◆ More than 3200 products
    - ◆ Three channels of distribution
- Model
  - Demand: A nested logit model
  - Pricing: Bertrand competition between groups

# The econometric study

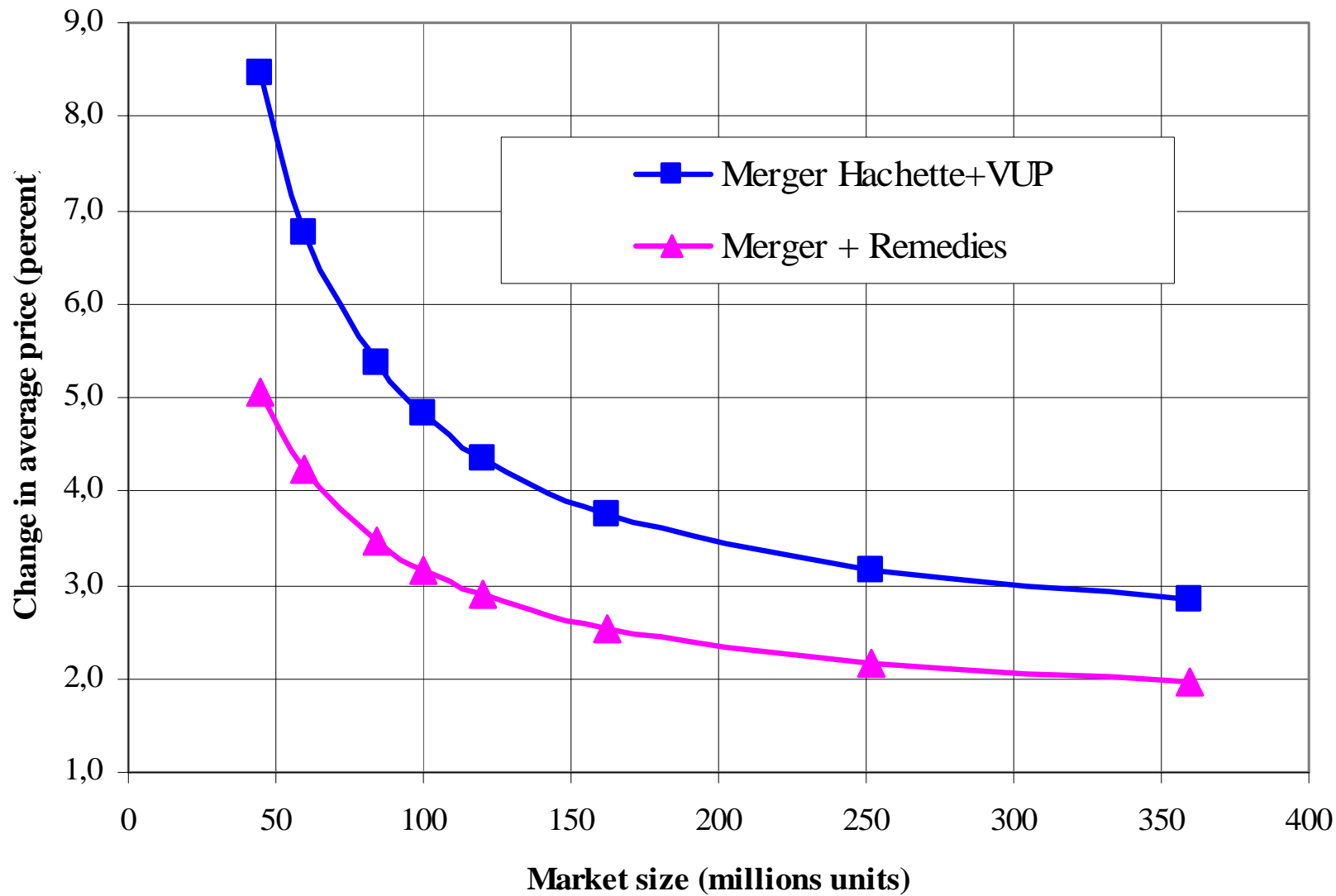


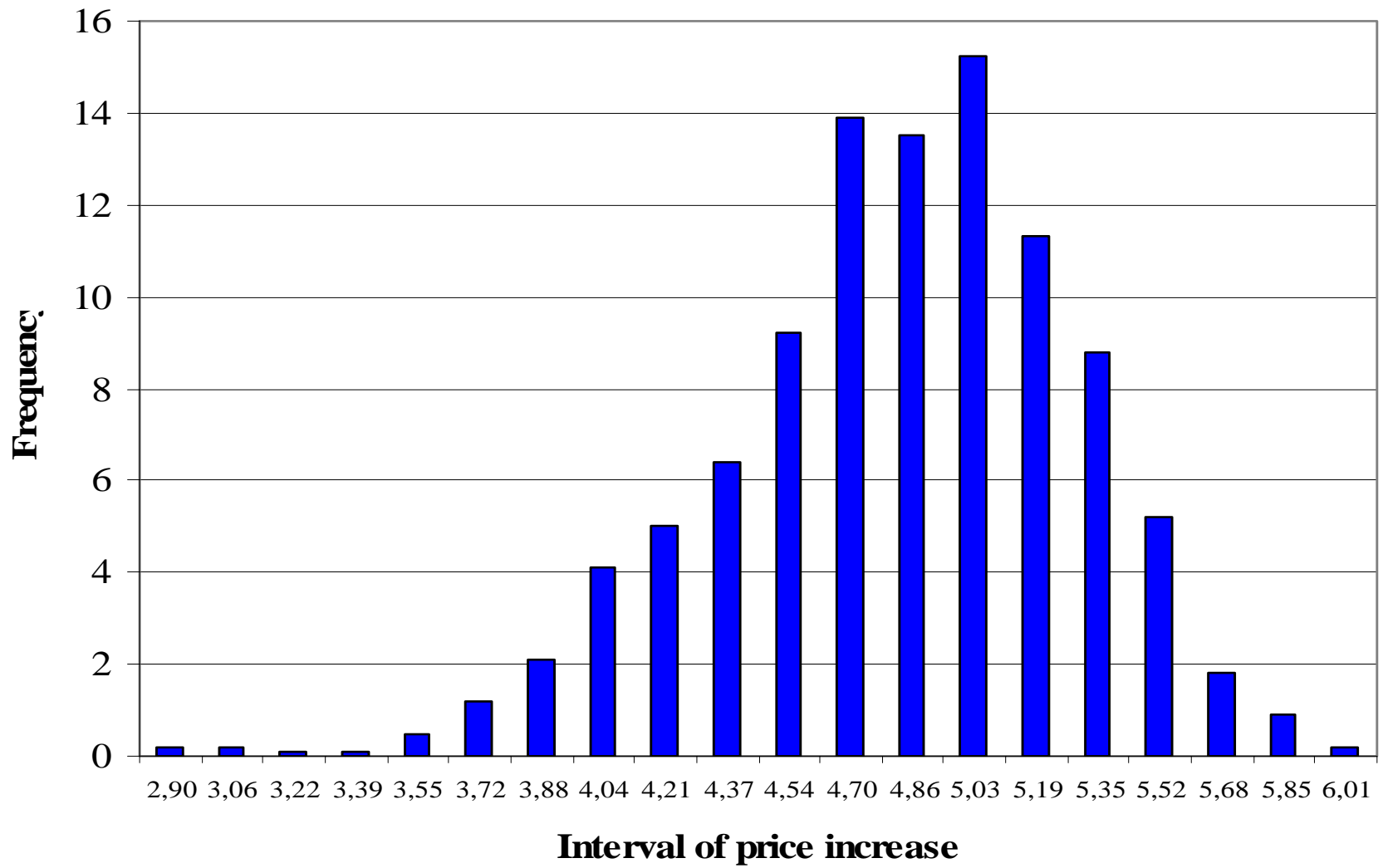
# The econometric study

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## ■ Results

- The model speaks about the industry
  - ◆ Example: Identification of effect of
    - Agatha Christie
    - Conan Doyle
    - Barbara Cartland
    - ...
- Significant increases in prices
- Changes in prices are function of market size
- Confidence intervals of price increases





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4. **A STATE AID PROBLEM**

# Context

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- Basic prohibition of state aids
  - EC Treaty (since Rome): Article 87 - 89
  - Mandatory (87(2)) or discretionary (87(3)) exceptions
- Case law
  - Altmark decision (July 2003)
    - ◆ Clear definition of public service obligations
    - ◆ Transparency on the definition of compensation
    - ◆ Subsidies must recoup incurred costs only
    - ◆ If no public procurement procedure, then compensation must be based on « costs of (...) well run and adequately provided (firm) (...) »

# Context

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- Basic prohibition of state aids
- Case law
  - Altmark decision
    - ◆ If no public procurement procedure, then compensation must be based on « costs of (...) well run and adequately provided (firm) (...) »
  - Particularly hard to implement
- A test
  - A subsidy is anticompetitive if it affects the market power of firms

# Example

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- A duopoly
  - Firm 1: High quality of service
  - Firm 2: Low quality of service
- A representative customer

$$\ln(s_i) - \ln(s_0) = \delta_i - \alpha p_i$$

- ◆  $N$  market size
- ◆  $s$  market share (quantity =  $Ns$ )
- ◆  $\delta$  quality
- ◆  $p$  price

# Example

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- Step one
  - Competition

$$\frac{p_i - c_i(Ns_i)}{p_i} = \frac{1}{\alpha p_i(1 - s_i)}$$

- Entry
  - ◆ Firm 1 makes profit
  - ◆ Firm 2 cannot enter because of entry costs

# Example

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- Step two
  - Public intervention

$$\pi_2 = \left[ (p_2 + t_2) - (1 - \tau_2) c_2(Ns_2) \right] s_2 Y - (F_2 - T_2)$$

- Compensation
  - ◆ Per unit of output sold
  - ◆ Per unit of marginal costs
  - ◆ Lump sum

# Example

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- Step two
  - Public intervention

$$\frac{(p_2 + t_2) - (1 - \tau_2)c_2(Ns_2)}{(p_2 + t_2)} = \frac{1}{\alpha(p_2 + t_2)(1 - s_2)}$$

# Example

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- Step three
  - Compare
    - ◆ Public intervention allowing for entry
    - ◆ Excessive public intervention

		Firm 1		Firm 2
Quality		0.6		-0.6
STEP 1	Margin	70%		65%
	Profit	0.54		-0.34
	Surplus		0.68	
STEP 2	Margin	68%		70%
	Profit	0.45		0.00
	Surplus		0.97	
STEP 3	Margin	67%		71%
	Profit	0.42		0.11
	Surplus		1.05	

# Concluding remarks

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- Empirical IO as a complementary tool for competition policy
- Research
  - Evaluation of the European competition policy
  - The search for speed
  - Various domains
    - ◆ Relevant market
    - ◆ Dynamics