The Economics of Collusion: Cartels and Bidding Rings
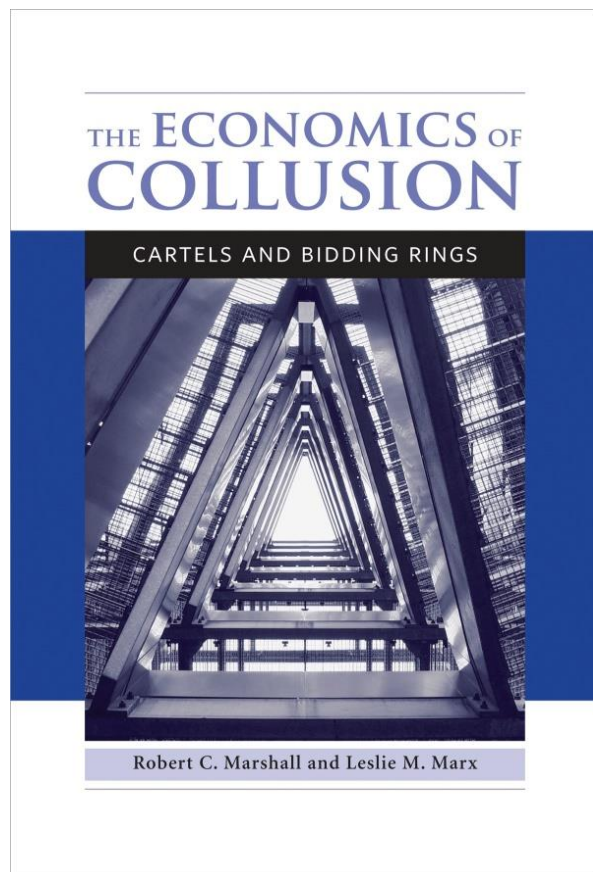
Robert C. Marshall
Penn State University
March 14, 2014

Overview of Presentation

THE ECONOMICS OF COLLUSION

CARTELS AND BIDDING RINGS

Robert C. Marshall and Leslie M. Marx

- Plus factors and super plus factors

- Economics of collusion

- Cartel information

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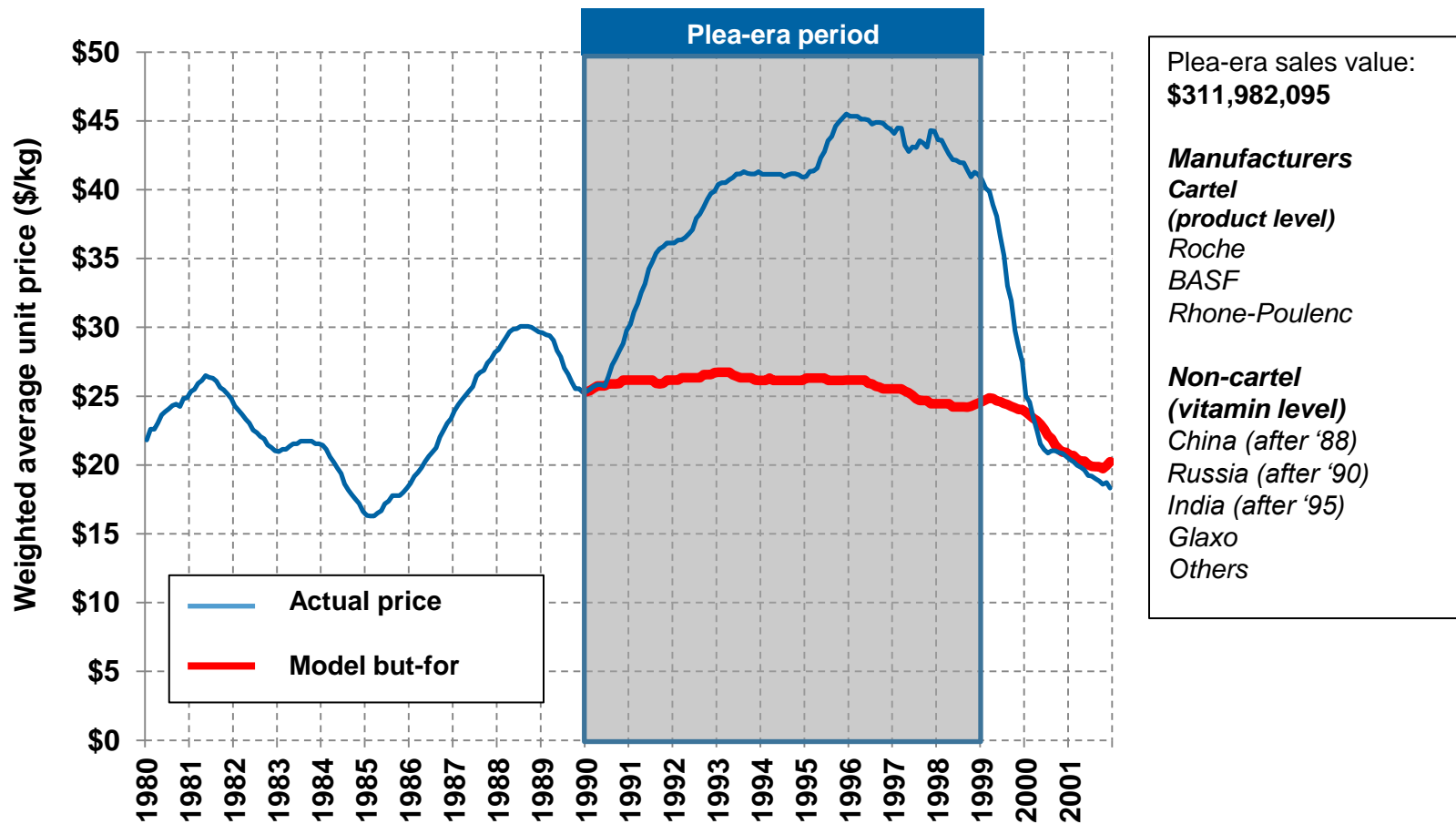ECONOMIC CONSULTING

Cartel Detection

- Plus factors
  - Economic actions and outcomes, above and beyond parallel pricing by oligopolistic firms, that are largely inconsistent with unilateral conduct but largely consistent with explicitly coordinated action

- Super plus factors
  - Strong inference of explicit collusion

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Super Plus Factors

- Some plus factors are *super* plus factors, such as
  - Interfirm transfers
  - Rising prices and profits in an industry with excess capacity
  - Sharing of sensitive competitive information
  - Changes in sales force incentives to "price before tonnage"
  - Dominant firm conduct in an industry without a dominant firm
  - Actual price significantly exceeding but-for price

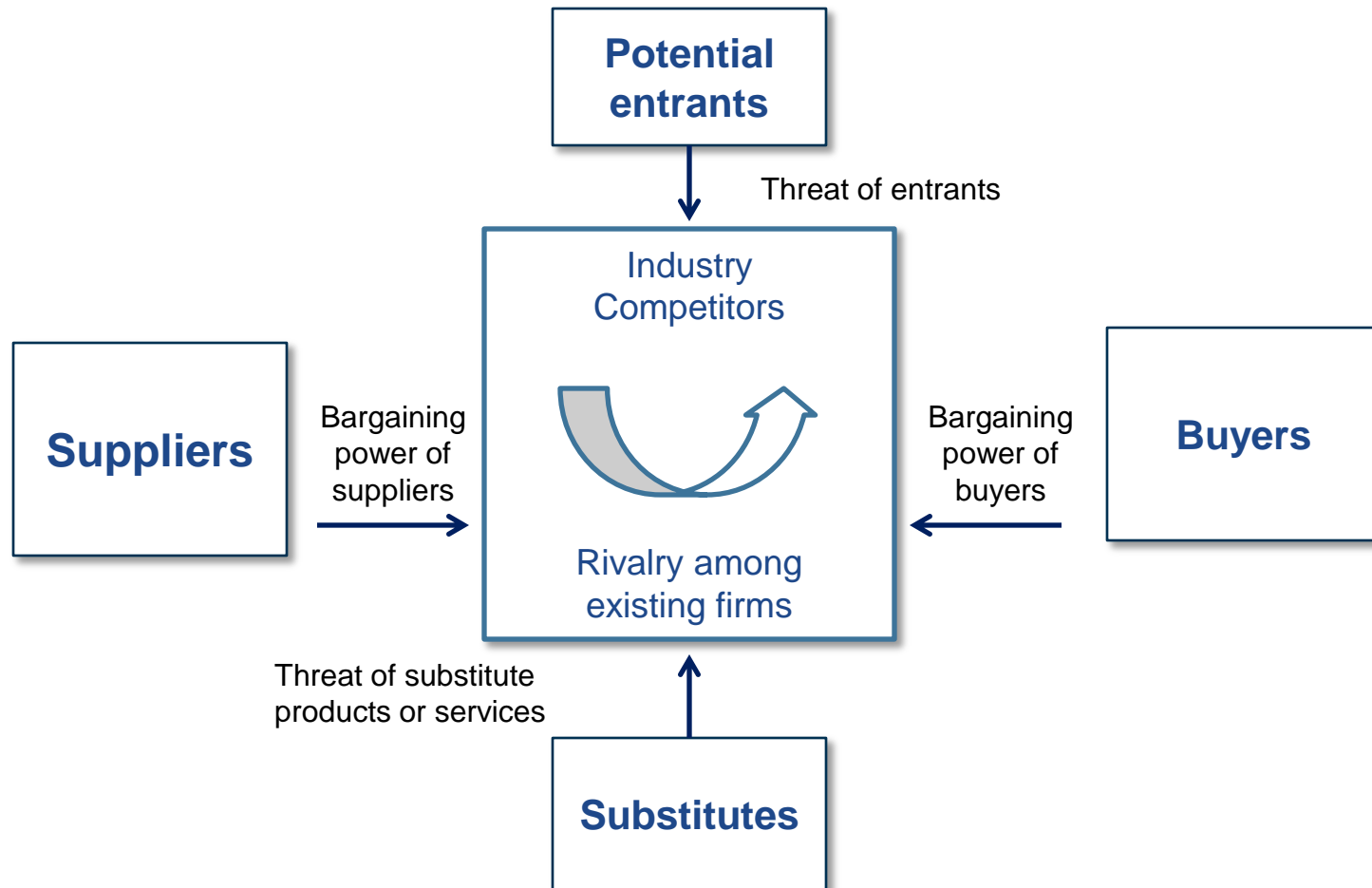# Modeling Enables Predictive Pricing to Compare Actuals to 'but-for'

Vitamin A Acetate 650 Feed Grade

Plea-era period

Plea-era sales value:
$311,982,095

Manufacturers
Cartel
(product level)
Roche
BASF
Rhone-Poulenc

Non-cartel
(vitamin level)
China (after '88)
Russia (after '90)
India (after '95)
Glaxo
Others

Legend:
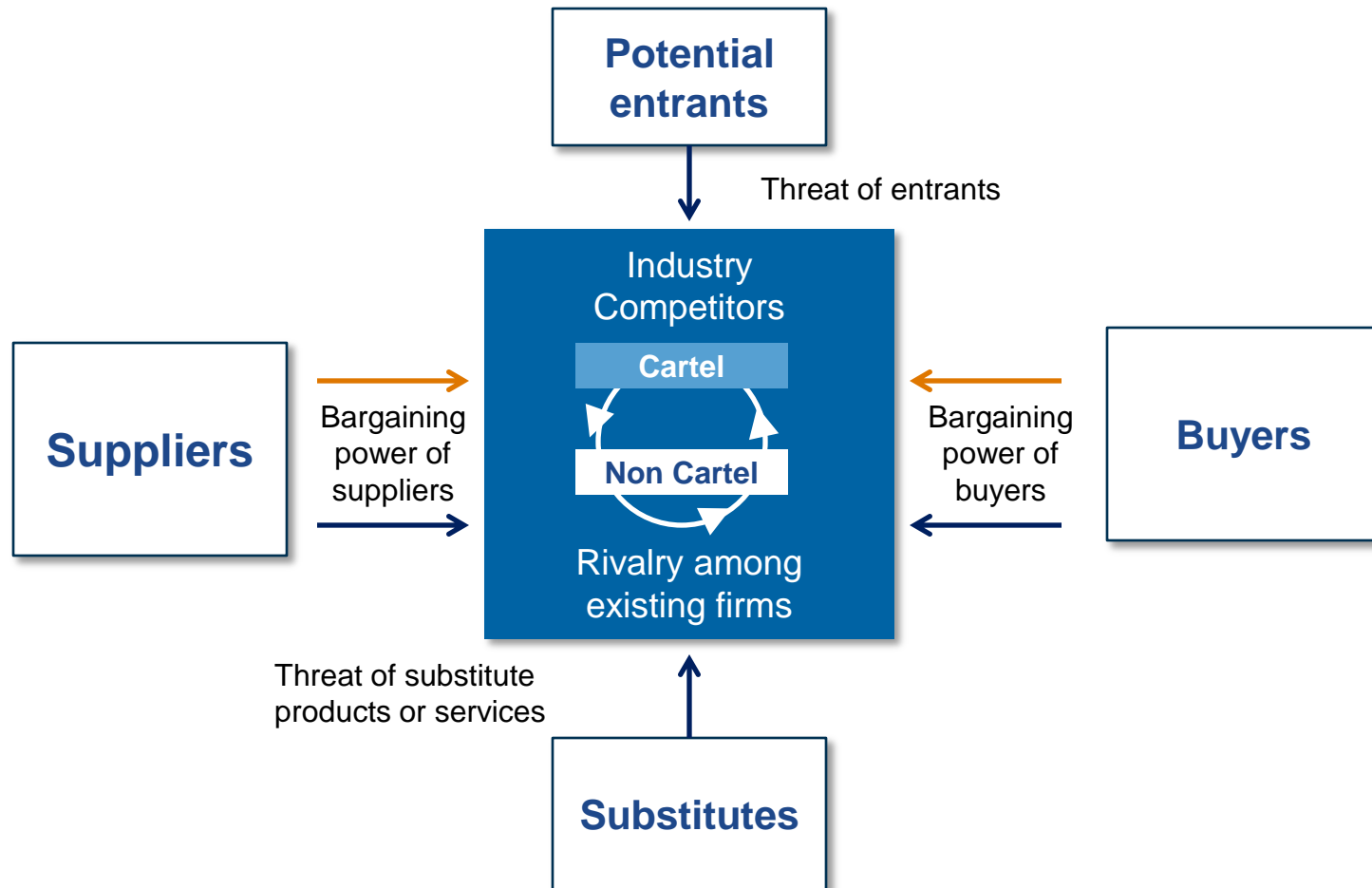— **Actual price**
— **Model but-for**

Source: Marshall and Marx (2012, Fig. 1.1).
Original Source: Expert Report of B. Douglas Bernheim, In re Vitamins Antitrust Litigation, MDL No. 1285 (D.D.C. July 16, 2001).

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Market Forces Driving Competition: Porter's Five Forces Diagram

Potential entrants

Threat of entrants

Suppliers

Bargaining power of suppliers

Industry Competitors

Rivalry among existing firms

Bargaining power of buyers

Buyers

Threat of substitute products or services

Substitutes

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Modified Five Forces Diagram for Collusion


```
                    ┌─────────────────┐
                    │   Potential     │
                    │    entrants     │
                    └─────────────────┘
                            │  Threat of entrants
                            ▼
┌──────────────┐      ┌─────────────────────┐      ┌──────────────┐
│              │      │      Industry       │      │              │
│              │      │    Competitors      │      │              │
│  Suppliers   │ ───► │  ┌──── Cartel ────┐ │ ◄─── │    Buyers    │
│              │      │  └── Non Cartel ──┘ │      │              │
│              │      │   Rivalry among     │      │              │
└──────────────┘      │   existing firms    │      └──────────────┘
   Bargaining         └─────────────────────┘         Bargaining
   power of                   ▲                        power of
   suppliers                  │                        buyers
                              │
   Threat of substitute       │
   products or services       │
                    ┌─────────────────┐
                    │   Substitutes   │
                    └─────────────────┘
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Collusive Structures are Required to Support Collusive Profits

- Stigler (1964) identified "secret deviations" as the key problem facing cartels

- To control secret deviations, a cartel must put in place three collusive structures

Source: Marshall and Marx (2012, Fig. 6.1).

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Collusive Structures Generate Super Plus Factors

Pricing Structures

- Implement price increases and quantity reductions
- Modify within-firm incentives

Super Plus Factors

- Rising prices and profits in industry with excess capacity
- Changes in sales force incentives to "price before tonnage"

Source: Marshall and Marx (2012, Fig. 6.1 & 6.2).

Collusive Structures Generate Super Plus Factors

Pricing Structures **Allocation Structures**

Secret Deviations

Enforcement Structures

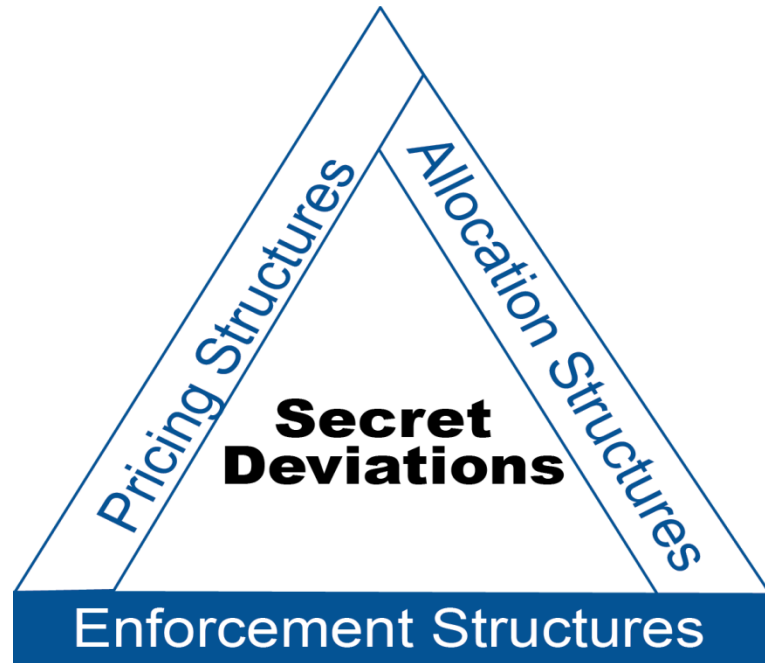| **Allocation Structures** |
|---|
| • Implement the division of surplus
• Establish redistribution mechanisms |

Super Plus Factors

• Interfirm transfers

Source: Marshall and Marx (2012, Fig. 6.1 & 6.2).

Collusive Structures Generate Super Plus Factors

Enforcement Structures

- Implement monitoring mechanisms
- Establish threat of punishment

Super Plus Factors

- Sharing of sensitive competitive information

Source: Marshall and Marx (2012, Fig. 6.1 & 6.2).

Example: Vitamins Cartel

Behaviors	Evidence
Changes just prior to the alleged conspiracy	"Price before Volume"
Inter-defendant transaction	End of year "true-ups" to maintain market share agreement
Inter-defendant communication	Regular meetings to (i) set price announcements, (ii) bids for major accounts, (iii) compliance with allocation of mkt shares
Competitively sensitive information known by competitors about others	Roche data book
Evidence of dominant firm activities	Elimination of independent blenders

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Problematic Conduct from Other Cartels

Product	Behaviors	Evidence
Graphite electrodes	Changes just prior to the alleged conspiracy	home country producer wins all domestic contracts
Nucleotide	Inter-defendant transaction	counterpurchasing agreements
Organic peroxides	Inter-defendant communication	discussions by cartel members of bids submitted
Cartonboard	Competitively sensitive information that each competitor knows about others	knowledge of planned downtime by other cartel firms
Carbon brushes	Evidence of dominant firm activities	denial of carbon block sales to non-cartel brush makers

Procompetitive Information Exchange

- Resolution of public good issues
- Resolution of coordination issues
- Eliminate duplicative investments in assessing market conditions

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Information Exchange within a Cartel

- Initiation of cartel agreement
  - Putting in place the structures that encumber secret deviations
- Implementation
  - Fending off buyer resistance
  - Future pricing and production
  - Allocation of collusive gain per agreement
  - Redistributions

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An Interpretation of Economic versus Legal Terminology

Communication				
Initiation	Implementation	Economics	Law	Unifying Terminology
Yes	Yes	Explicit collusion	Explicit collusion	Strong explicit collusion
Yes	No	Explicit collusion	Tacit collusion	Weak explicit collusion
No	No	Tacit collusion	Tacit coordination	Tacit coordination

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Buyer Resistance

- Industrial buyers are different from individual buyers
- Buyers use competitive forces to police market
- Buyers resist price increases, which takes many forms
- Cartel will have regular communications amongst members so as to understand and manage buyer resistance
  - Representations by a buyer of the pricing of another cartel firm, that is inconsistent with the cartel agreement
- Cartel must take actions to mitigate buyer resistance
  - Example: price announcements

Price Announcements and Prices for Vitamin A Acetate 650 Feed Grade

Source: Marshall and Marx (2012, Fig. 11.1).

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Monitoring of Pricing and Allocation Structure Compliance

- Use of third parties
- Customer contracts with seller audit provisions
- Cartel pressures buyer to increase transparency of procurements
- Special subcommittees of trade associations to review accuracy of firm-specific reported information
- Export associations

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