

**Proposed structure:**

- \* Jonas Björnerstedt and Johan Stennek, Bilateral Oligopoly
- \* Roman Inderst, Leveraging Buyer Power
- \* Arghya Ghosh and Morita Hodaka, Social Desirability of Free Entry: A Bilateral Oligopoly Analysis
- \* Paul Dobson and Michael Waterson, The Competition Effects of Industry-wide Vertical Price Fixing in Bilateral Oligopoly
- \* Chrysovalantou Milliou and Emmanuel Petrakis, Upstream Horizontal Mergers, Vertical Contracts, and Bargaining
- \* Nisvan Erkal, Supplier Interaction, Asset Specificity, and Product Choice
- \* Harborne Stuart, Creating Monopoly Power
- \* Janusz Ordover and Greg Shaffer, Wholesale Access in Multi-Firm Markets: when is it profitable to supply a competitor?
- \* Yongmin Chen and Philip G. Gayle, Vertical Contracting Between Airlines: An Equilibrium Analysis of Codeshare Alliances
- \* Patrick Rey and Jean Tirole, Financing and Access in Cooperatives
- \* Dermot Leahy and Peter J. Neary, Absorptive Capacity, R&D Spillovers, and Public Policy
- \* Leslie Marx and Greg Shaffer, Rent Shifting and the Order of Negotiations
- \* Alexander Raskovich, Ordered bargaining
- \* David McAdams, Michael Schwarz, Who Pays When Auction Rules Are Bent?

# **Introduction to Special Issue on Negotiations and Cooperative Arrangements in Industrial Organization: Models and Applications**

by

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There has been a resurgence of interest in situations where competing firms engage in and negotiate over cooperative arrangements (such as supply contracts and joint ventures). Recent significant examples include the analysis of credit card associations (Rochet and Tirole, 2002), patent pools (Lerner and Tirole, 2004) and Segal and Whinston (2000). Significantly, the predictions and policy outcomes arising from such situations have proved subtler than simple competitive analysis based on posted prices. In particular, issues such as bargaining power and the types of negotiated prices have become an active area of research.

These advances have motivated this special issue. The goal is to bring together a series of models and applications that deal with one or more aspects of the cooperative arrangements that firms directly or indirectly enter into. Consequently, this issue combines both more conceptual contributions that deal with ways to model contracting between firms, in particular in the form of bargaining, and more applied contributions that study, in particular, the competitive effects of various forms of contracting between rivals and between suppliers and buyers.

It is fair to say that there does not yet exist a single “workhorse” model that researchers would predominantly use to study contractual relations between firms. Previous contributions have used take it or leave it offer games to focus on gains from trade (see the survey by Rey and Tirole, 2006), bilateral negotiations involving cooperative (or axiomatic) and non-cooperative bargaining solutions such as the Myerson-Shapley value (Inderst and Wey, 2003; de Fontenay and Gans, 2005), and posted price models of sequential oligopoly (as in Economides and Salop, 1992). In this respect the choice of articles in this volume represents a fair representation of the whole spectrum. As the various contributions document, all these approaches are valuable and justifiable as they serve to highlight different features of firms’ contractual relationships in the most parsimonious way.

Similarly, this special issue deals with a wide variety of issues that all arise when dealing with the contractual relationship between firms. Some of the articles that deal with vertical relations are (either primarily or tangentially) concerned with the issue of buyer and supplier power and how this interacts with the choice of contracts, investment incentives and efficiency. Other articles deal with contracts between vertically integrated firms and their downstream rivals and, consequently, the scope of foreclosure. These contributions provide a bridge to those that deal only with horizontal relationships between rivals such as in the case of research joint ventures.

The organization of the volume reflects the diversity of research in this area. The first few papers examine aspects that arise from ‘bilateral oligopoly’ whereby firms in concentrated vertical segments deal with one another at arms length. We then move into applications of such models to issues of entry, mergers, investment and acquisition of

market power in a vertical segment. Then we turn to situations where competitors deal directly with one another as suppliers of various goods and services before turning to the form of contractual arrangement parties might agree to.

### *Bilateral oligopoly*

In “Bilateral Oligopoly“, Jonas Björnerstedt and Johan Stennek propose a model that allows for many upstream as well as many downstream firms, all interacting through bilateral negotiations. The authors allow for general contracts. In the case where downstream firms do not compete, these ensure that the resulting equilibrium outcome, namely the whole vector of upstream supplies and downstream sales, is fully efficient. Björnerstedt and Stennek also consider the case with downstream competition and further use their framework to study a range of different questions, relating to the impact of incomplete trading networks as well as the impact of size on the terms of trade. In particular, they develop conditions for when larger buyers (or likewise larger suppliers) can obtain better terms of trade through a lower (or respectively higher) average price.

“Leveraging Buyer Power” by Roman Inderst shares with the analysis of Björnerstedt and Stennek both the non-cooperative approach as well as the treatment of the issue of buyer power. Inderst analyzes the different channels through which the exercise of buyer power can both trigger and accelerate further concentration in the downstream industry. Motivated by an increasing concentration in many retail markets, in particular those for fast-moving consumer goods, the article links buyer power to size. As the focus there is largely on the competitive advantage that buyer power generates, the model uses (in contrast to that by Björnerstedt and Stennek) a linear contracting

approach: Buyer power is then reflected in better purchasing terms “at the margin,” making the more powerful buyer also a more competitive rival at the retail level.

A framework with linear contracting is also used in “The Competition Effects of Industry-wide Vertical Price Fixing in Bilateral Oligopoly” by Paul Dobson and Michael Waterson. Their contribution compares the competition and welfare effects of vertical price fixing through industry-wide resale price maintenance. In either instance, both with and without the possibility of retail price maintenance, bilateral supply contracts are determined through negotiations. As in the previous contribution by Inderst, part of their analysis also deals with the distribution of bargaining power between suppliers and retailers, though in the contribution by Dobson and Waterson changes in bargaining power are accounted for by the degree of differentiation among suppliers and retailers. The analysis relates the social effects of retail price maintenance to the distribution of bargaining power.

Bridging the frameworks with linear and non-linear vertical contracting, in “Upstream Horizontal Mergers, Vertical Contracts, and Bargaining” Chrysovalantou Milliou and Emmanuel Petrakis study both settings as well as one where the choice of contract types is endogenous. Their focus is on upstream mergers, where they study both the incentives of suppliers to merge as well as the implications of a merger on consumers and welfare. As in Dobson and Waterson, the implications are shown to vary with the distribution of bargaining power in the vertical chain.

#### *Applications of bilateral oligopoly*

Arghya Ghosh and Hodaka Morita take the bilateral oligopoly model based on Nash bargaining and use it to consider the incentives for entry of downstream firms. They

demonstrate that the number of entrants is inefficiently low when upstream firms have strong bargaining power. This is somewhat surprising given earlier models based on Cournot oligopoly where the opposite is true. Ghosh and Morita highlight the fact that when they have low bargaining power many of the rents associated with entry accrue upstream. Hence, private entry incentives can be significantly lower than social incentives.

The contribution by Nisvan Erkal on “Supplier Interaction, Asset Specificity, and Product Choice” still focuses on vertical contracting, though there the form of contracts and its impact on retail competition is of no immediate concern. This holds as the supplied input now only affects fixed costs and as the analysis focuses on the short run. Erkal analyzes how through its effect on relative bargaining power in the presence of more than one buyer or seller, the choice of investment decisions interacts with that of the positioning of firms’ products.

In a related vein to Erkal, Gus Stuart’s article on “Creating Monopoly Power” analyzes incentives for capacity choice. In contrast to the previous contributions, and most notably also to the more conceptual contribution by Björnerstedt and Stennek, Stuart takes here a cooperative (or axiomatic) approach by using the concept of the core. This is combined with another stage at which firms choose capacity and for which non-cooperative solution is chosen. Stuart uses the multiplicity of outcomes that arises from the core in order to study how beliefs about the outcome, next to competition, affect a supplier’s optimal choice. This builds upon and supports the use of the core as a tool for competitive analysis (Gans, 2005).

*Direct horizontal cooperation*

Two contributions in this special issue bridge the study of purely vertical negotiations with that of purely horizontal agreements. In both “Wholesale Access in Multi-Firm Markets: when is it profitable to supply a competitor?” by Janusz Ordover and Greg Shaffer and “Vertical Contracting Between Airlines: An Equilibrium Analysis of Codeshare Alliances” by Yongmin Chen and Philip Gayle vertically integrated firms negotiate with a non-integrated rival over the supply of an input.

Ordover and Shaffer analyze the incentives of vertically integrated firms to provide an essential input to a new (downstream) competitor. They show that even in a static environment, where this is no scope for the vertically integrated incumbents to collude on excluding an entrant into the downstream market, a wholesale market that supports downstream entry may not open up. That is, in these cases there is no bilateral transaction that would be jointly profitable for a vertically integrated incumbent and a downstream entrant. This paper also analyzes the circumstances when in equilibrium a downstream rival will be supplied by a vertically integrated firm.

Chen and Gayle consider an application to airline codeshare alliances. Through codesharing double marginalization on an intermediate (complementary) flight can be reduced (or, in principle, eliminated). But codesharing can also be used to dampen competition if one carrier offers also a direct flight (i.e., if it can be thought of as being “vertically integrated” in that it needs no further input to serve a customer). Chen and Gayle show that in order to extract the benefits from dampened competition, this can also lead to the exclusion of (“not vertically integrated”) rivals.

The issue of granting potential rivals access to an important input is also dealt with in “Financing and Access in Cooperatives” by Patrick Rey and Jean Tirole. Their

contribution analyzes a dynamic investment framework that relates access policies, financing and growth of cooperative ventures. Through granting new members access only at discriminatory terms, cooperative ventures protect the investment of earlier members but, from a social perspective, may sacrifice static efficiency.

The particular case of research joint ventures is next taken up in “Absorptive Capacity, R&D Spillovers, and Public Policy” by Dermot Leahy and Peter Neary. The paper studies the interplay between two of the main forces that determine the overall impact of R&D ventures for firms as well as consumers and total welfare, namely the possible positive effect on knowledge spill over and the possible dampening of product market competition. Their approach specifies a general model of the absorptive capacity process and shows that costly absorption both raises the effectiveness of own R&D and lowers the effective spillover coefficient, which altogether weakens the case for encouraging research joint ventures.

#### *Negotiated contracts*

The final set of papers deals with more conceptual issues of negotiated contracts. Leslie Marx and Greg Shaffer as well as Alexander Raskovich analyze the role of how agreements are reached at sequentially between a single buyer and two sellers. In “Rent Shifting and the Order of Negotiations” Leslie Marx and Greg Shaffer ask whether a buyer would want to negotiate first with a weaker or with a stronger supplier and find that the outcome depends crucially on whether it is efficient to ultimately procure from a single supplier or from both simultaneously. In contrast to the previous contributions on vertical contracting in this volume, which all consider simultaneous contracting, with sequential and observable contracts the issue of rent shifting becomes key: Initially

agreed contracts can serve the purpose of tilting bargaining power in subsequent negotiations and extracting a larger share of the respective joint profits.

In “Ordered Bargaining” Alexander Raskovich deals with a similar setting as Marx and Shaffer, though here rent shifting is not the focus as the buyer can only purchase from a single supplier. He demonstrates that this can soften our belief in ‘small numbers’ competition and its ability to bring about strong welfare improvements relative to monopoly.

Finally, in “Who Pays When Auction Rules Are Bent?” David McAdams and Michael Schwarz go one step back and ask whether the rules that are supposed to govern bilateral contracting (and that also a researcher would enshrine in the chosen formal model) are in fact sustainable. Focusing on auctions, they find that any scope for rule-breaking by either the seller or buyers is detrimental for the seller in terms of lower expected revenues.

More generally, the analysis of McAdams and Schwarz brings us back to the question of which (game) form one should choose when modeling either vertical or horizontal interactions in markets. In practice, firms may find ways out of agreed contracts when a better opportunity arises through another negotiation or may likewise bring competing bids into play in bilateral negotiations or, as suggested in the analysis of McAdams and Schwarz, they may want to bend the rules of an auction in order to extract more revenues.

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