# NSC Project Report

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## Abstract

This report consists of two models dealing with coalition behaviors in the market. The ...rst model investigates the competitive and cooperative issues among consumer and producer groups in a regulated utility, when the price is determined by committee members open to lobbies by interest groups. In the second model, I ...rstly set up a general multiproduct framework for the monopoly case. Several properties mentioned in the tying literature are provided. I further consider the duopoly case, where both ...rms use both tying and prices as strategic competition.

KEY WORDS lobbying, core, incomplete information, regulatory price, reputation, multiproduct, tying competition.

## 1. Motivation

This report consists of two models dealing with coalition behaviors in the market. The ...rst paper is motivated by the following observation. The role of interest groups has been discussed extensively in the literature of capture and corporatist theories (see Williamson, 1989). The former stresses the competitive interaction of interest groups in various subjects such as trade and protection (Krueger, 1974), tari¤ and quota formation (Bhagwati and Shrinavasan, 1980), and entry and market organization (Applebaum and Katz, 1987). The latter is concerned with relationships between interest groups and the state where policy arises from bargaining between the parties rather than as a result of competitive lobbying (Aidt, 1997). Among the various interest groups, the power of "consumer group" has not yet received enough attention[*] in the literature, despite of the importance in public utilities. The aim of our paper is to analyze the competitive and cooperative issues among consumer and producer groups in a post regulated monopoly, from both static and dynamic points of view.

To address the competitive issue, we propose a di¤erent framework based on the following observation in the current lobbying literature. We show that this approach gives more precise prediction than the two main approaches in the literature: in‡uence function (for example, Aidt (1997)) and alternative o¤ering game. To address the cooperative aspect of interest groups, we propose a coalition game, where interest groups negotiate the welfare shares and hence the regulatory price implicitly. A coalition is a subset of the player set and the coalition value is de...ned by the ®-characteristic function[*], which describes what a player can guarantee to itself when the remaining players act to minimize its payo¤. In our case of merely two interest groups, consumer group's coalition value is exactly the consumer surplus associated with the regulatory price settled in the competitive lobby game. We adopt the core as the solution concept, since compared to the generally adopted Nash Bargaining solution, it is an easier solution to handle potential multilateral cooperation. Our conclusion shows that cooperation is Pareto improving since it reduces competition itself rather than the excessive rent seeking expen-

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[*]Few exceptions can be found in Fabella (1993) and Braeutigam (1993).

[*]See for example Friedman (1991).

ditures (see Aidt (1997)). Finally, we consider private information from the monopolist. In a two-stage framework, there will be a separated equilibrium where a high cost monopolist chooses to compete in the first stage to avoid information revelation via cooperation. In other words, this equilibrium predicts a Nash-dominated strategy be chosen in a stage game, which provides a counter example to the line of reputation literature (see for example Kreps and Wilson (1982))

The second part of the project is motivated by the following observation. Tying refers to firms that offer for sale packages containing at least two different products. For instance, a computer set includes hard disks and a monitor. The gain in profit from tying is analyzed in Burstein (1960), Adams and Yellen (1976), Lewbel (1985), and McAfee, McMillan and Whinston (1989). In the literature, firms are assumed to produce only two products, which simplifies the analysis, yet restricts its implication to the strategic multiproduct oligopolist competition. In this paper, we follow the line of Tauman, et. al. (1997) and Gul and Stacchetti (1999) in modelling a general multiproduct framework, but concentrate on using tying and pricing as strategies for firms.

In both Tauman, et. al. (1997) and Gul and Stacchetti (1999), a general case of n products offered by n different firms is assumed. Both papers assume quasilinear utilities, defined on bundles of products and consumers select the best bundle, given the prices. The main difference between the two models is that Tauman, et. al. deal with strategic equilibrium where firms are price setters, while Gul and Stacchetti deal with Walrasian equilibrium where firms are price takers. Though in a multiproduct framework, both papers assume that each product is produced by a single firm. That is, the consumption bundles here also indicate the bundles of firms that produce the product, which is, of course, not tying we meant. We firstly set up a general multiproduct framework for the monopoly case. Several properties mentioned in the tying literature are provided. We further consider the duopoly case, where both firms use both tying and prices as strategic competition.

## 2. Results and Discussion

In the first part of the report, our result shows that the equilibrium regulatory price is less than half of the monopoly price in the linear demand case. Moreover, we prove that the equilibrium price is increasing in the relative effect of the consumer group and decreasing in the size of market demand. Similar to the product market, the firm's markup over marginal cost is proved to be negatively related to the elasticity of demand but in a bigger extent.

When both parties cooperate, we adopt the core as solution concept. The main conclusion is that both the monopolist and the consumer group benefit from cooperation, and the size of the core is decreasing in the relative influence of the consumer group.

Though statically dominant, cooperation is not the only choice in the case of cost uncertainty. In a two-stage framework, we show the existence of a separating equilibrium where a low cost monopolist chooses to compete in the first stage. Since it consists of a Nash dominated choice in the first stage, it serves as a counter example to the results in the line of reputation effects (Kreps and Wilson (1982)).

In the second part of the report, we show that in monopoly, the NE-outcome exists for any value function $v$: If $v$ is monotone and $v(fkg) > c_k$, $[© ; f\frac{v(©)}{\#(©)}g_{k2©}]$ is an equilibrium, and moreover, the monopolist extracts all the profit. In the duopoly case, we show

that for $c_1=c_2$; there always exist one NE, and we leave the heterogenous cost case for further discussion. An easy extension of this model is to interpret each product as individual market, and hence our model can provide implications to the literature of multinational production. Another extension is to consider different degree of competition in each product market, such as duopoly in one market and competition in another.

## 3. Self evaluation

As mentioned by the referee of this project, the originally proposed contents have already been discussed in the literature. To concentrate on the main issue of coalition behaviors in the market, I propose instead two models, addressing the possible coalition of producer and consumer group in the first model, and the issue of tying (product coalition) in the second model. Therefore, the outcome of this project is much better than originally proposed. I expect to publish the first model in Public Choice or the Journal of Public Economics, and the second model in Economic Theory or Journal of Industrial Economics.

During the project, the first model has been adopted in the co-authoring work "Lobbying Incentives and Policy Reformation" with Wang.

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