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Value of reputation in the chain-store game with multiple incumbents

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Abstract

We extend the basic chain-store game to the two-incumbent case. A highly stylized model is developed to analyze incentives of incumbent firms to maintain reputation for toughness. Entry deterrence has a public good property. Since maintaining reputation is costly, each incumbent has an incentive to free ride on the entry deterring activities of its counterpart. As a result of these incentives, both incumbents accommodate when they both have a relatively high initial reputation for toughness. This extreme form of underinvestment in entry deterrence becomes less likely as the number of markets with potential entry increases. We also demonstrate that an incumbent's payoff is a decreasing function of its reputation over a large range of parameters. This result stands in sharp contrast to the existing versions of the chain-store game where high reputation for toughness always benefits a weak incumbent.

JEL classification: L13; C72

Keywords: Chain-store game; Entry deterrence; Repeated games; Reputation

1. Introduction

This paper continues the study of the role and value of firms' reputations. The literature on reputation effects has originated from trying to resolve Selten's (1978) chain-store paradox. In the chain-store game, a multi-market monopolist faces a finite sequence of potential entrants. Each entrant observes the actions taken in the previous markets and chooses whether to enter the market monopolized by the incumbent firm. If there is an entry the monopolist has two options;

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to fight the entry or to accommodate. Accommodation is the best short-run response for the incumbent whereas fighting is an optimal policy only if it deters some of the future potential entrants. In the unique subgame perfect equilibrium of the complete information game all entrants enter and the incumbent accommodates, given any history of the game.

Kreps and Wilson (1982b) and Milgrom and Roberts (1982b) have shown that addition of a small amount of incomplete information is sufficient to overcome this paradoxical game-theoretic prediction. Specifically, they demonstrate that if entrants assign even a small probability to the event that the incumbent is a "tough" type who prefers a price war to accommodation, the incumbent will fight in early markets to preserve reputation for "toughness".

A limitation of the chain-store game is that each of the markets with potential entry is monopolized by a single firm. While in some situations this might be a reasonable assumption, there are numerous examples where markets are comprised of multiple established firms (this may be because monopolization is against the law). For instance, if we consider large retail stores and pick a random city in the United States, then it is very likely that one can find K-Mart in addition to a Wal-Mart store. Similar observations apply to many other markets.

The paper extends the basic chain-store game to the multiple-incumbent case. We consider a hypothetical situation where two established firms operate retail stores in a number of markets. Each of these markets is threatened by an entry of a different potential competitor. Potential entrants are faced in a sequence and outcomes in the previous markets become known to all later players. Following entry, each of the two chain stores simultaneously and independently decides whether to fight the entry (for instance, a sharp price cutting) or to accommodate (share the market peacefully with the new entrant). If a potential competitor decides to stay out, then the two chain stores split market profits. The entrant prefers to open a store only if neither of the chain stores fights. If the entrant enters, then in the short run each chain store strictly prefers to accommodate no matter what the other chain store's action is. Fighting by even a single chain store imposes short-run losses on both of them. We investigate whether both, one or none of the chain stores is willing to fight entry to preserve reputation for "toughness" and whether entry is successfully deterred. It turns out that this depends on the absolute as well as relative initial reputations of the two incumbents. This reputation has value only if some of the future entrants are deterred. Note that it has value to both chain stores. That is, even if only one of the chain stores fights to maintain its reputation, the other chain store may benefit from that reputation. And each chain store prefers the other one to fight if that prevents entry in some of the future periods. In other words, entry deterrence has a public good property. Since maintaining reputation is costly, each incumbent has an incentive to free ride on entry deterring activities of its counterpart.

When a chain store has a sufficiently high initial reputation, its incentives to free ride are increasing with the counterpart's reputation. As a result of these incentives, both chain stores accommodate entry when they both have a relatively high initial reputation for toughness. We also demonstrate that the chain store with a relatively high initial reputation assumes the responsibility of pretending to be a tough type while the chain store with a relatively low initial reputation accommodates. The latter chain store is in the best of all worlds; it does not incur short-run fighting costs and entry is deterred. Thus, over a large range of parameters, a chain store's payoff is a decreasing function of its reputation. This result stands in sharp contrast to the existing versions of the chain-store game where high reputation for toughness always benefits a weak incumbent.

As the number of markets with potential competition increases, gains from both free riding and contributing to entry deterrence increase. The increase in gains from contributing to entry