

A Signaling Approach to Reputation

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Extended Abstract

We study reputation dynamics in continuous-time signaling games with one-sided incomplete information. Public signals about the informed player's type and his action are distorted by Brownian noise. The framework encompasses both the case of private and interdependent values. For example, we show that it is well-suited to study predatory behavior in an oligopoly in which a leader facing a competitive fringe has private information about the state of the demand or about its production cost. For any fixed discount rate, we characterize equilibria as a solution to a system of ordinary differential equations and show that the set of public perfect equilibrium payoffs coincides with the convex hull of the Markov equilibrium payoffs. In contrast to a setup with commitment types, as [Faingold and Sannikov \(2011\)](#), reputational incentives depend on the equilibrium behavior of each type of the informed player. In the oligopoly example, learning is slower in our signaling framework as compared to a commitment-type setup in which one of the two types of leader produces the static Stackelberg quantity. In contrast to the dynamic signaling literature, we do not a priori focus on a specific class of Markov equilibria, but rather show that as far as the payoffs are concerned focusing on Markov equilibria is without loss of generality.

In the second part of the paper, we extend the framework to model not only predation aimed at inducing exit but also entry deterrence, as in the limit pricing

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model of [Milgrom and Roberts \(1982\)](#). An incumbent who is privately informed about whether the demand is strong or weak faces a potential entrant who decides when, if ever, to pay an entry cost to become an incumbent's competitor or take an outside option. At each moment in time, the incumbent chooses its output so to affect the market price, which is a noisy signal of the market demand. As in standard predatory pricing models, the incumbent has incentives to overproduce to induce the entrant to believe that the demand is weak, but in equilibrium, the uninformed firms anticipates the signal-jamming behavior. We provide sufficient condition for equilibrium uniqueness and show that the equilibrium prediction are consistent with the observed pattern ([Goolsbee and Syverson, 2008](#); [Sweeting et al., 2020](#)): price is lowest right before the entrance of the rival. We derive intuitive comparative static results: incentives to signal are weaker when the price are very informative of the state of the demand. While the equilibrium cannot be described in closed form, we show that because of its numerical tractability, the model is amenable to further empirical investigation to quantify, for example, the welfare effects of predation.

References

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