

A Model of Fortification Using Bayesian Persuasion

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ABSTRACT

In this paper, we analyze a communication game between a Sender and multiple Receivers using Bayesian Persuasion in the context of fortification. The government acts as a Sender and wants firms (the Receivers) with critical infrastructure to bolster their defenses. The firms may benefit from bolstering only if an attack is imminent. Bolstering does not offer any benefits, otherwise. Each firm is also assumed to have different expected returns and/or costs of fortification. We compare optimal persuasion mechanisms when the government is perfectly able to observe the actual state of nature as opposed to the scenario where it receives noisy signals about the actual state of nature. We show that, in most cases, such a persuasion mechanism exists but involves limiting information. We show that overall welfare increases when the government persuades firms to fortify. Further, we find that the persuasion mechanism that maximizes welfare and the one that maximizes the government's payoff coincide. Finally, we Pareto-rank welfare under different scenarios.

KEY WORDS: Fortification; Signals; Bayesian Persuasion; Informativeness

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