How to Protect against Zero Intelligence: Idiosyncratic Signals in Beauty Contest Games*

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Abstract

The beauty contest game (BCG) serves as a core framework for demonstrating behavioral non-equilibrium patterns such as focal point choices and level-k reasoning in the first period and over time. When incentivized with distance payoffs (based on difference between choice and target), zero-intelligence or low level of reasoning accounts for significant efficiency losses in such games as the unique equilibrium is also Pareto-optimal and payoff maximizing for all players. To avoid such failures, we introduce new rules to obtain Pareto-optimal behavior rapidly. We present a new version of the BCG that removes the bounded choice interval and thus eliminates iterative elimination of dominated strategies. We further add correlated idiosyncratic signals that can serve as (equilibrium) coordination devices. We find that choices in these new versions of the BCG are instantaneously closer to equilibrium as compared with the standard BCG and its variations. Indeed, our design alternatives of BCGs can greatly affect the use of focal points and level-k reasoning and protect against zero-intelligent agents and, thus, coordination failures. The main reason is that the equilibrium choices, which in our new designs require even more complex computational steps, are identical to the intuitive, level 0, or (average) zero intelligent choices.