

Multi-Period Stackelberg Game with Dynamic, Price-dependent, Distributional Robust Demand

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This paper investigates a multi-periodic channel optimization facing uncertain, price-dependent, and dynamic demand. The picture of the market uncertainty is incomplete. Only the price and time-dependent mean and standard deviation are known and may depend on the price history. The actual distribution itself is unknown as is typically the case in real-world problems. An algorithm finding the optimized decentralized channel equilibrium is developed when the downstream member optimizes her expected profit stream by a distributional robust approach, and the upstream member (leader) considers it as the follower's reaction function. The algorithm allows for strategic decisions whereby the current demand is scaled by the previous price setting.