Risk Averse Dynamic Pricing and Advertising with Exponential Demand

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We analyze a special class of dynamic advertising and dynamic pricing models under constant absolute risk aversion when a monopolist is selling a fixed number of items. Based on a time dependent version of the Gallego, van Ryzin model with exponential distributed reservation prices we additionally consider unit costs and isoelastic advertising effects. We derive closed form expressions of the optimal pricing and advertising policies and of the certainty equivalent. Moreover, we present an efficient simulation technique to study characteristics of different degrees of risk aversion, particularly the concentration of the profit distribution and expected evolution of optimal prices. Furthermore solution formulas of the stochastic model and the corresponding deterministic model with continuous state space will be compared.