

DYNAMIC PRICING WITH LINEAR PRICE CORRECTION

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We consider a monopolist dynamic pricing problem with multiple products, multiple resources, time-homogeneous demands, and a finite selling horizon. Two common concerns for dynamic pricing are the potentially expensive re-optimizations and the frequency of price adjustments. To address this, we introduce a pricing heuristic which only requires solving a large convex optimization problem *once* at the beginning of selling horizon and then automatically adjusts the prices over time. That is, apart from the initial optimization, our heuristic can be implemented in online fashion. Not only the intended heuristic reduces the burden of re-optimizations, it only requires that we dynamically adjust the prices of a *small* subset of products, leaving the prices of the remaining products unchanged throughout the selling season. These are the products which form a "base" with respect to the initial optimization problem. We provide a theoretical bound on expected revenue loss which depends on the choice of the base and a general updating schedule of the products in the base. (We allow the price of different products in the base to be updated at different times.) Given time, we will also discuss some extensions to the setting of time-varying demands. In particular, we will address whether one can still adjust the prices of only a small subset of products in such setting.