Summary: We propose a parameter estimation method based on what we call the minimum decisional regret principle. We focus on mathematical programming models with objective functions that depend linearly on costs or other parameters. The approach is illustrated for cost estimation in production planning using linear programming models. The method uses past planning data to estimate costs that are otherwise difficult to estimate. We define a monetary measure of distance between observed plans and optimal ones, called decisional regret. The proposed estimation algorithm finds parameter values for which the associated optimal plans are as near as possible to the observed ones on average. Such techniques may be called behavioral estimation because they are based on the observed planning or decision-making behavior of managers or firms. Two numerical illustrations are given. A supporting hyperplane algorithm is used to solve the estimation model. A method is proposed for obtaining range estimates of the parameters when multiple alternative estimates exist. We also propose a new validation approach for this estimation principle, which we call the target-mode agreement criterion.

MSC:

- 90C05 Linear programming
- 62P20 Applications of statistics to economics
- 62F05 Asymptotic properties of parametric tests

Keywords:

- parameter estimation
- inverse optimization
- production-planning costs

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