Nonparametric Matching and Efficient Estimators of Homothetically Separable Functions*

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Abstract

For vectors x and w, let $r(x, w)$ be a function that can be nonparametrically estimated consistently and asymptotically normally. We provide consistent, asymptotically normal estimators for the functions g and h, where $r(x, w) = h[g(x), w]$, g is linearly homogeneous and h is monotonic in g. This framework encompasses homothetic and homothetically separable functions. Such models reduce the curse of dimensionality, provide a natural generalization of linear index models, and are widely used in utility, production, and cost function applications. One of our estimator's of g is oracle efficient, achieving the same performance as an estimator based on local least squares knowing h. We provide simulation evidence on the small sample performance of our estimators, and an empirical production function application.

JEL Codes: C14, C21, D24.

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