

"Nonparametric estimation of returns to scale"
joint work with T. Severini.

ABSTRACT. Estimating the returns to scale (RTS), or testing for constant returns to scale, has long been a major preoccupation of applied economists. In many applications, however, the production function is specified to have parametric, e.g., Cobb-Douglas or constant elasticity of substitution, functional forms despite the fact that such specifications impose strong a priori restrictions on the patterns of substitutions among various inputs and are themselves subject to misspecification. By contrast, in this paper the functional form of the production function and its degree of homogeneity are both assumed to be unknown, and we show how to estimate the latter (which can be interpreted as the RTS) as efficiently as possible when some or all of the factors of production are endogenous. Since the production function is ill-posed in this setting, care has to be taken while deriving the efficiency bound for estimating the RTS and constructing an efficient estimator.