Discussion Paper No. 542

An Elasticity Can Be Estimated Consistently Without A Priori Knowledge of Functional Form[***]

by

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Revised November 1982

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[***] This research was supported by National Science Foundation Grant SES 8014239 and by North Carolina Agricultural Experiment Station Project NC03641.

Abstract

We consider an open question in applied price theory: Without a priori knowledge of a firm's cost function or a consumer's indirect utility function, is it possible to estimate price and substitution elasticities consistently by observing a demand system? As the work of White (1980), Guilkey, Lovell, and Sickeles (1981), and others has shown, ordinary flexible functional forms such as the Translog cannot achieve this objective. We find that if one is prepared to assume that elasticities of substitution cannot oscillate wildly over the region of interest then consistent estimation is possible using the Fourier flexible form provided the number of fitted parameters increases as the number of observations increases. This result obtains with any of the commonly used statistical methods, as examples: multivariate least squares, maximum likelihood, and three-stage least squares. It obtains if the number of fitted parameters is chosen adaptively by observing the data or chosen deterministically according to some fixed rule. We approach the problem along the classical lines of estimability considerations as used in the study of less than full rank linear statistical models and thereby discover that the problem has a fascinating structure which we explore in detail.