Consumer Demand Analysis According to GARP: Discussion

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This paper explores the issue of the power of nonparametric tests to check for the consistency of data with utility maximization. Alston and Chalfant provide an excellent review of nonparametric approaches to consumer-demand analysis. They test for consistency, separability, and power. The authors address two important questions: First, how does one define power for nonparametric situations, and is that definition comparable to the parametric situation? Second, can the power of nonparametric tests be improved? The authors measure the statistical power of nonparametric methods using a parametric test, though they do not address whether it is legitimate to use parametric tests on nonparametric methods.

Nonparametric analysis is a useful concept. It teaches us something about demand functions without assuming the shape of the unobservable utility function. As Alston and Chalfant point out, parametric consumer-demand analysis has become very complicated. Researchers are criticized if their analysis does not contain a sophisticated functional form for a system of equations, a complex error structure, or "a dazzling array of diagnostic tests devised to detect errors in model specification." Parametric analysis assumes there is a correct functional form associated with utility and demand functions, even though the true functional form is unknown. So, there are two choices in demand analysis: (1) we can let the price and quantity observations reveal the associated preferences, or (2) we can assume a functional form that reflects a particular preference structure. Since all demand analysis is based on observations of quantities purchased at specific prices, revealed-preference theory takes a more direct approach to observed behavior and provides useful information. The lesson from this paper is that both approaches complement each other and the combination is more useful than either approach taken alone.

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Given their results, Alston and Chalfant are surprised at the "unpopularity or apparent disinterest in the nonparametric approach." Perhaps there is a stigma attached to revealed-preference theory. Or maybe researchers prefer the simplicity and straightforwardness of working with a fully specified utility function. Nonparametric analysis is not free of assumptions. It is strongly based on the idea of the "representative consumer"—aside from its own standard axioms. In fact, Alston and Chalfant required nonsample evidence to support their analysis, and the tests they utilized also required imposing certain restrictions.

In both approaches, it is necessary to abstract from the complexities of the real world and develop simple models that capture the "essentials" of the economic process. Since not all models prove to be "good" and since as scientists we must sort out the bad from the good, Alston and Chalfant provide additional information to help in this verification process. It is true that economic theory is not informative about functional forms. Yet, we expect models of demand, production, and aggregate consumption to contain precise, well-specified relationships that reflect economic theory. Are we asking too much of our models?

In addition to the important role of correct model specification, there is another equally important issue that is often overlooked. How good are our data? We often assume that the data used to estimate the model parameters are true measurements of their theoretical counterparts. In practice, this happens only in the best of circumstances. All sorts of measurement problems creep into the data. This is true especially with aggregate data, but even carefully constructed survey data have problems. Given that the nonparametric approach focuses on the observation itself, great care is needed in knowing how the data were obtained. Government data are often generated by several agencies using different techniques. The problem is even greater with international data. When aggregation was first studied by Theil in his book, *Linear Aggregation of Economic Relations,* the aggregate data were generated from a set of micro relations.

Can we be sure today that the aggregate or macro data that we work with are consistently derived from micro data?

To sum up, Alston and Chalfant are making great strides in improving the tools available to researchers. It seems that we will always have to make some qualifications—whether the analysis is parametric or nonparametric. However, before putting revealed preferences into the econometrician's tool kit, we still need to step back and scrutinize our data, especially since the nonparametric approach is so heavily dependent on the data.

Reference

Theil, H. *Linear Aggregation of Economic Relations*. Amsterdam: North-Holland, 1954.