

Problem Set #1
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Problem 2 Keane (2010) and Rust (2010) make a strong case in favor of structural estimation with which I largely agree. However, I believe that there is room for both structural and experimental methodologies, as long as their underlying assumptions are taken into account and the limitations of the results are acknowledged.

A main advantage of structural estimation is the underlying economic theory, which allows for interpretation of the results, and therefore foster the advance of the economic science. According to Rust, structural econometrics strengthens the link between economic theory and empirical findings, by seriously relying on economic theory and imposing structure on the questions under investigation. Structural estimation first develops or takes an economic model, often specifying agents optimization problems, choosing specific utility or production functions, including unobservable constructs as the opportunity cost of time, marginal utility of wealth, introducing heterogeneity on many layers, and imposing many other assumptions depending on the case. The benefit is that when such a model is estimated, the structural econometricians are able to tell a detailed story of complex economic interactions. In contrast, even if able to find evidence of an effect of a variable X on outcome Y , atheoretical approaches have little or nothing to say about the propagation mechanism. With the examples of atheoretical research of the effects of military experience on earnings, and of reduced mother contact on children's cognitive development, Keane illustrates limitations of interpreting the results.

Another advantage of structural estimation is the explicit statement of assumptions, which makes them tractable, subject to tests, validation and future research. The experimentalist approach has the disadvantages of often relying on assumptions which are not made explicit; as a result researcher sometimes use econometric methods when the assumptions are not fulfilled and acquire spurious results. For instance, when effects across the population are heterogeneous, even an "ideal" (i.e. perfectly randomly assigned) instrument may not be valid; when the treatment and control groups are not similar, "difference-in-difference" estimation is spurious; when unobservable factors are time-variant, "fixed effects" estimates are biased.

However, in my view, the experimentalist econometrician needs not necessarily be as ignorant as the anti-models, presented by Keane and Rust. I believe there are good and bad examples of research in both camps. A well-trained atheoretical econometrician who understands the underlying assumptions can choose an appropriate estimation procedure, include data on relevant variables rather than rely on some magic of IV or "fixed effects" estimation, and design an experiment in such a way that the results are valid.

Another fairly strong claim by Keane, with which I only partly agree, is that theory should always come first. He claims that one should start with a theoretical model and then test it against data: "we cannot even begin the systematic assembly of facts and empirical regularities without a pre-existing theoretical model". To substantiate

his claim, he provides examples of the history of mechanics in which great discoveries occurred because scientists (Galileo and Newton) first had a theoretical model in mind, and second confirmed it by an experiment. Although true, this is a somewhat one-sided presentation of how discoveries are made. There are also numerous examples in physics where an observation occurs first, which then fosters an advance in science. To name a famous one, Feynman developed the theory of elementary particles and quantum electrodynamics, following an observation of a wobbling plate in a cafeteria (Feynman (2010)). In economics, often researchers find motivation in developing new theories in order to reconcile new empirical facts, such as Klette and Kortum (2004) and Kongsamut et al. (2010) to mention but a few. Therefore, I believe that atheoretical estimation, although being less ambitious than the structural one, can uncover key facts from the data, which can inform what assumptions are reasonable in a model and more generally, be a source of motivation for developing new and better economic models.

To conclude, I share Rust's view that there is not a single correct methodology. Probably what matters more is the particular case and how the methodology is applied.

References

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