Problem Set 1

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There are two competing paradigms in econometrics: the "structural" approach and the "reduced form[1]" approach. This division between the two ways of thinking has created a rift in the economics profession and has split economists in two camps.

In our view, one of the criteria that one should consider before choosing between models should be Marschak's principle, according to which, an econometrician should follow the approach that requires fewer assumptions. At first sight, it might seem that "reduced form" models would always be the best option since many people think that they are nearly assumption-free. However, this is far from the truth. According to Keanes (2010), atheoretical models and structural models usually rely on assumptions that are similar and as Keanes sarcastically adds, the only difference is that "in a structural approach a priori assumptions about behavior must be laid out explicitly while in an experimentalist approach key assumptions remain implicit". Moreover, there is also a widespread view in the literature that strong nonparametric identifying restrictions are good but parametric ones bad (Rust, 2010). However, as Rust argues, is a nonparametric assumption, such as the rational expectation hypothesis, weaker than an assumption about the agents' utility function?

This is not the only misconception that surrounds structural models. Critics of the structural approach assert that atheoretical approaches (such as Instrumental Variables) should be preferred on the basis of simplicity. However, most of the time these estimators are not very simple and their interpretation is not always clear: Since atheoretical approaches do not state the a priori assumptions that could justify the exogeneity assumption, it is usually unclear why an instrument is considered exogenous (Keanes, 2010). Hence, when these economic assumptions are absent, "the proper interpretation of inferences is obscured" (Keanes, 2010).

Even though most of Keane's arguments have some merit, at some points he sounds as a fanatic rather than a scientist. Responding to the literature of nonparametric identification, he contends that structural econometricians should prioritize validation over identification. In other words, according to his view, if an econometric model provides estimates that have a good fit, then identification should not bother us. At this point Keane sounds much like his critics since he actually propounds that it is ok if a model is a black box as far as it produces good estimates. Nevertheless, a scientist must be concerned with both identification and goodness of fit.

Moreover, both Keane and Rust seem to miss one important aspect of the debate: Economic interpretation of an estimator is deemed important when someone cares about such an interpretation and this is not always the case. For instance, "reduced form" models are widely used in empirical asset pricing and the fact that a coefficient might not be interpretable in the context of economics, is irrelevant. Lastly, in Keane's and Rust's papers, "reduced form" models are depicted as nearly useless which is not the case. For instance atheoretical models such as VAR models have given solutions in economics and finance multiple times.

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[1] The term "reduced form" is not an accurate description of the atheoretical models since these models are generally not reduced forms of an actual economic model. However, this term is consistent with the standard terminology that is being used to describe such models.

In sum, both frameworks are useful but one should keep in mind that there are limitations to inference both with and without theory. However, we should all agree that ruling out theory in empirical work is a self-imposed limit.

References

[1] Keane, M. P. Structural vs. atheoretic approaches to econometrics. *Journal of Econometrics* 156, 1 (May 2010), 3-20

[2] Rust, J. Comments on: "Structural vs. atheoretic approaches to econometrics." *Journal of Econometrics* 156, 1 (May 2010), 21-24