Econ 615 Assignment 1
Aaditya Dar

The objective of this note is to compare the reduced form (henceforth RF) and structural approaches of conducting research in economics. One doesn't have to go far into the assigned reading list of this course to find out about the current divide in econometrics. (I wasn't aware of how sharp the divide is until I read some of the papers on the subject.) On one side there are the structuralists like Keane, Robin, Rust, Wolpin, who, generally speaking, try to estimate the parameters of the model first and then perform sensitivity analyses, and on the other there are researchers like Angrist, Card, Duflo, Imbens who make use of RF techniques, which entails estimating direction and magnitude of causality, typically using an experimental approach.[1] The contrasting methods of research will be clearer from a case study of two seminal papers in development economics: Chattopadhyay and Duflo (henceforth CD 2004) [RF] and Kaboski and Townsend (henceforth KT 2011) [structural].

CD 2004 essentially tries to understand the role of gender in policy making. They do so by analyzing the case of the reservation policy in India, according to which women are randomly assigned to GPs. They then compare outcomes in reserved and unreserved seats and are careful to point out that, "this reduced form difference is not an estimate of the comparison between a system with reservation and a system without reservation. The policy decisions in unreserved GPs can be different that what they would have been if there was no reservation whatsoever […] What are trying to estimate is the effect of being reserved for a women, rather than not reserved, *in a system where there is reservation*" [emphasis original]. Crucial to the identification strategy is to ensure that GPs were randomly allocated so that any differences in outcomes can be attributed to the gender of the leader (the task is also made simpler as very few unreserved GPs elect women leaders). The key step, it seems to me, in a research like this, is the design of the study – or whatever it is that guarantees identification (in a different case it could be a "clever" instrument). Once CD 2004 convinced the readers that reservation policy was random they went on to compare the provision of public goods across the two types of GPs, finding that leaders invest more in infrastructure that is of greater relevance to their own genders. The data is backed up by an economic model of democracy that suggests that identity of policymakers can be used to achieve outcomes that are closer to the preferences of the median voter.

KT 2011 set out to analyse the equilibrium effects of an aid program. They are trying to explain data from a quasi-experimental research study that could not be explained using RF methods (specifically, why does consumption and borrowing increase one-for-one when aid increases). The authors do so by modeling the intervention as something that relaxes the borrowing limits for households and this happens differently for different villages. Once the model was ready the authors could create various simulations and they found that the outcome was similar to that in the data. I had a harder time understanding this paper and I could be mistaken but I think the

[1] I hope I haven't misclassified anyone and while I am aware of the drawbacks of labeling, this exercise is only indicative of the current state in the profession. In my opinion, this divide is futile and I agree with Rust (2010) that "it really isn't productive to criticize the *status quo* in economics these days, nor is it productive to try to 'market' the virtues of structural estimation".

general procedure was to first construct a barebones model then estimate the parameters and finally, look at partial equilibrium effects.

Having discussed the two competing methods, the next logical question that arises is which one is better? We should, however, be wary of making sweeping generalization and since it is a "waste of time to [try to] engage in salesmanship" (Rust 2010, p.8) and therefore, we now proceed to highlight the pros and cons. In CD 2004, we saw that the advantage of using RF was that it was possible to capture the effect of gender that may not have been possible in a non-randomized / quasi-experimental study (because we would have the problem of endogeneity). Additionally, the exercise was also computationally easier. In KT 2011, the structural approach came to our rescue because RF methods were giving odd results. Moreover, we were able to perform out-of-sample predictions and see what would happen in the counterfactual, which is not possible with RF. Clearly, both methods have their set of advantages, but they also have their failings. Heckman (2010) summarizing the literature on the "structural vs. reduced form" approach makes notes of the criticism of both schools of thought: "difficult to identify full primitive structure without implausibly strong assumptions" (a commonly held quip against the structural approach that Keane 2010 and Rust 2010 try to argue against) and "estimates not useful for welfare analysis because they are not deep parameters; endogenous to policy regime (RF approach). However, an even bigger issue would be what Rust calls as the "antipathy for structural economics" and Heckman calls, "the abandonment of economic choice theory". While I now understand where Keane and Rust are coming from, I should also add that I too have a minor quibble with Keane (2010) in that I don't think it is correct to label the RF approach as "atheoretic". From what I understand there are various strands even within the RF literature and Heckman (2010) points out that RF can have multiple meanings and a good RF based research (like CD 2004) also comes from theory. To conclude, it may be useful to combine the advantages of both the approaches like Heckman does when he advocates for the use of Marschak's Maxim (but since I haven't fully comprehended the complete paper I refrain from making any comments on the same).

References:

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