Answers to Problem Set 6
Econ 312, Spring 2019
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This draft, May 24, 2019

1. Plim of both estimators is β. Plim is a large sample property along a path.

   - "Can someone explain what plim is?" `https://math.stackexchange.com/questions/224959/can-someone-explain-what-plim-is`

   - "Convergence of random variables" `https://en.wikipedia.org/wiki/Convergence_of_random_variables`

2. See posted notes on pretest estimator. All preliminary testing estimators with fixed significance level inconsistent, as $N \to \infty$, unless $X_1 \perp\!\!\!\perp X_2$ and $(X_1, X_2) \perp\!\!\!\perp U$.

3. Read Friedman's "Methodology of Positive Economics" (1953) and especially footnote 11.

   (a) See my notes on identification (posted).

   (b) Cowles postulates models in advance; has no algorithm for learning from data; Friedman suggests various approaches for revising and testing models.

   (c) Bayesian and abductive approaches do *ex post* inference and go forward after looking at the data; classical methods announce rules of inference before seeing the data. Dealing with surprise is the essence of abduction. Heckman and Singer (2017) discuss how to cope with surprise (see especially Gilboa et al., 2015).

(d) This rule is the classical dogma. The Hypothesis Testing 1 handout shows many examples where this approach throws away *ex post* information.

4. See, e.g., a recent paper by Abadie et al. (2017), "Sampling-based vs. design-based uncertainty in regression analysis" (full reference on last page).

5. (a)-(f) is all contained in my sampling handout. "*g*" is covered in reference cited to answer 4.

6. See my notes on causality and structural models (with Pinto).

7. "Credibility" is defined as success with regard to certain statistical properties: (a) bias, (b) replicability, and (c) transparency. (a) and (b) are major goals. Transparency is about statistical features of a procedure, not necessarily interpretability, consilience, external validity, etc. It focuses solely on problem P-1 in my handout on causality (solo-authored). See Keane (2010) as cited.

8. See my handout on vote counting methods. With low enough power, procedure is inconsistent.

References

Abadie, A., S. Athey, G. W. Imbens, and J. M. Wooldridge (2017). Sampling-based vs. design-based uncertainty in regression analysis. Unpublished.

Friedman, M. (1953). The methodology of positive economics. In M. Friedman (Ed.), *Essays in Positive Economics*. Chicago: University of Chicago Press.

Gilboa, I., L. Samuelson, and D. Schmeidler (2015). *Analogies and Theories: Formal Models of Reasoning*. Oxford, UK: Oxford University Press.

Heckman, J. J. and B. Singer (2017). Abducting economics. *American Economic Review: Papers and Proceedings 107*(5), 298–302.

Keane, M. P. (2010, Spring). A structural perspective on the experimentalist school. *Journal of Economic Perspectives 24*(2), 47–58.