ROUGH FRAMEWORK FOR PAPER (using old material as filler for now)

Nadav Tadelis

First draft: FILL
Current Draft: FILL

Abstract

ABSTRACT HERE

1 Introduction

Intro

2 Defining the Model and Assumptions

Let Z_i represent the treatment status of individual i where $Z_i = 0$ when an individual is not treated, and $Z_i = 1$ when an individual is treated. When using a proxy model, assignment of the treatment is the same for all individuals.

Definition 1 *(Treatment) Under a proxy, the treatment status of one individual is analogous to the treatment status of the population, i.e.,*

$$Z_i = Z.$$

2.1 Comparison to the Instrumental Variable model

The SUTVA (Rubin, 1990):

a. If $Z_i = Z_i'$ then $R_i(\mathbf{Z}) = R_i(\mathbf{Z}')$.

b. If $Z_i = Z_i'$ and $R_i = R_i',$ then $S_i(\mathbf{Z}, \mathbf{R}) = S_i(\mathbf{Z}', \mathbf{R}')$.

Part a of the SUTVA states that an individual's value R_i is only dependent on her own treatment status Z_i; i.e. the treatment status of other individuals $Z_j, j \neq i$, does not affect R_i. Part b requires that the potential outcomes $S_i(\mathbf{Z}, \mathbf{R})$ of i are independent of the treatment status's (Z_j) and risks $(R_j(\mathbf{Z}))$ of other individuals. Clearly, from Definition 1, part a will always be satisfied under a proxy model.

Claim 1 *(Assumptions) When applied to a proxy model, the original SUTVA from Rubin's Causal model simplifies to:*

$$\text{If } Z_i = Z_i' \text{ and } R_i = R_i',\ \text{then } S_i(\mathbf{Z}, \mathbf{R}) = S_i(\mathbf{Z}', \mathbf{R}').$$

References

Angrist, J.D., Imbens, G.W., and Rubin, D.B. (1996), "Identification of Causal Effects Using Instrumental Variables," *Journal of the American Statistical Association*, 91:444-455.

Angrist, J.D., and Lavy, V. (1999), "Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievement," *The Quarterly Journal of Economics*, 114(2):533-575.