

POLI 171: Problem Set 2: Potential Outcomes

Due Thursday, January 25, at the beginning of class

Do not collaborate with other students on this assignment. You may complete this assignment using R, or you may perform the calculations with a calculator. In either case, you should show your work (including your R code, if applicable). For this assignment, I am relaxing the requirement that the problem set must be typed. It is alright to hand-write this homework, as long as your handwriting is neat.

Union Membership and Ideology

In addition to their economic function, labor unions historically played a political role as well. Left-of-center political parties as diverse as the Democratic Party of the United States, the Social Democratic Party of Germany, the Communist Party of Italy and the Peronist Party of Argentina used labor unions to mobilize, socialize and politicize their working-class supporters. There is already a large body of research that suggests that union membership can affect a person's party identification (e.g., whether they consider themselves a Democrat or a Republican). Can union membership also affect a person's ideology or change their policy preferences?

In this problem set, you will use the following (obviously made-up) dataset to calculate the “effect” of union membership on a person's ideology. In this dataset, ideology (your outcome variable) is measured on a single Left-Right dimension using a 21-point scale, ranging from -10 (far-left) to 10 (far-right). Union Member (your treatment variable) takes on a value of “Yes” if the person is a member of a union, and “No” otherwise.

Surname	Union Member	Ideology if Union Member	Ideology if Not Union Member	Individual Treatment Effect
Abernathy	No	3	4	
Baca	Yes	-4	-2	
Chang	No	5	2	
Dunn	Yes	-2	1	
Emami	Yes	-3	-2	
Fan	No	0	0	
Garcia	No	3	2	
Hassan	No	2	2	
Imbert	No	-1	-1	
Jones	Yes	-5	-3	

Question 1 (6 points)

For this first question, we will imagine that we are able to observe both potential outcomes for each individual—the individual’s ideology if they are a member and their ideology if they are not a member.

- a) Calculate the Average Treatment Effect (ATE) of union membership on ideology
- b) Calculate the Average Treatment Effect on the Treated (ATT) of membership on ideology
- c) In 1-2 sentences, explain the difference in what these two estimands are measuring

Question 2 (8 points)

In practice, we can only observe one potential outcome for each individual. In particular, we observe only the “Treatment Outcomes” of union members and only the “Control Outcomes” of non-union members.

- a) Calculate the Difference-in-Means Estimate (DM) that we would observe in the real world if we simply compared the average ideology of union-members to the average ideology of non union-members
- b) Give a specific example of an omitted variable or a selection effect that would explain why the DM estimate is different from the ATE and the ATT in this case, and in 1-3 sentences discuss why this variable would bias the DM estimate (i.e., why the variable would cause the DM to diverge from the ATE and the ATT). In order to do that, you will have to sketch out a potential causal link between this variable and the treatment variable.