

7.1

1/1 point (graded)

Which condition is essential when using the difference between treatment and control groups to estimate ATT?

☐ Treatment-control balance
✓

☐ Temporal stability

☐ Reversibility

☒ Unit homogeneity

Explanation

If treatment and control groups are balanced, we can say that assignment to treatment is ignorable and the two groups are exchangeable. Therefore, the difference between treatment and control groups gives a good estimate of the treatment effect.

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7.2

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Which condition do we use to have the below equation valid?

$$E[Y_1|X=1] - E[Y_0|X=0] = E[Y_1|X=1] - E[Y_0|X=1]$$

☒ $E[Y_1|X=1] = E[Y_1|X=0]$

☐ $E[Y_1|X=1] = E[Y_0|X=0]$

☐ $E[Y_0|X=1] = E[Y_0|X=0]$



☐ $E[Y_0|X=1] = E[Y_1|X=0]$

Explanation

This substitution uses the treatment-control balance condition that the expected potential outcomes if not treated are compatible between those who are treated and those who are not treated. In the treatment group we observe $E[Y_1|X=1]$, but we do not observe $E[Y_0|X=1]$. We need both to calculate the treatment effect for the treated: $E[Y_1|X=1] - E[Y_0|X=1]$. The treatment-control balance condition lets us substitute the latter term for what we observe in the control group, $E[Y_0|X=0]$, allowing us to calculate the ATT via $E[Y_1|X=1] - E[Y_0|X=0]$.

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7.3

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True or False. In order to estimate ATT, we mainly rely on the treatment-control balance condition. We also often invoke an additional (hidden) assumption

☒ True

☐ False



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