Inferential Statistics (1)

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Housekeeping

- Another homework will be posted today.
  - Due a week from today.
Housekeeping

• Review: What is a histogram?
• Difference of Means tests
Difference of Means Test

• We have a treatment group and a control group
  • We want to know if their outcome on the post-test is different

• We take one mean, we subtract it from the other
  • Bam! We have a difference of means

• If the treatment had no effect, do you think the means of the two groups will be exactly the same, or slightly different?
Review: Null Hypothesis

• My theory says that greater inflows of foreign direct investment (FDI) cause higher economic growth. What is the null hypothesis?
  • A. That a complete absence of FDI causes economic growth
  • B. That higher inflows of FDI causes more economic growth
  • C. That higher inflows of FDI cause equal or lower economic growth
Difference of Means Test

• So how do we tell whether the difference is because of the treatment or because of random chance?
  • Statistical significance
  • Tells us: If the null hypothesis is true and there is no treatment effect, how strange it would be to see this big of a difference between our two groups?
• How big of a difference do we need to see before it would be sufficiently strange? This depends on:
  • The sample size in each group
  • The variance of each group
• The bigger the groups and the smaller the variance, the more precise our estimate of the difference.
My Theory

• Hypothesis: Diaspora-owned firms are more likely than purely foreign firms to report that social ties are important to their initial entry decision.

• What is the treatment group?
  • A. Diaspora-owned firms
  • B. Non-diaspora-owned firms
The Importance of Social Ties in Firm Entry Decisions

Likelihood This Factor is Rated Positive and Important

Non-Diaspora-owned

Diaspora-Owned
My Theory

• How should I respond to these results?
  • A. Conclude the theory is incorrect (i.e. reject the null hypothesis)
  • B. Conclude the theory is correct (i.e. accept the null hypothesis)
  • C. Conclude that the test I conducted is not strong enough to tell me whether my theory is correct (i.e. fail to reject the null hypothesis)
Next Steps

• What would be a reasonable next step?
  • A. Re-run the study in Georgia with a larger sample size.
  • B. Re-run the study in another country with a larger sample size
  • C. Rewrite the theory to make the opposite prediction
  • D. A or B
Other thoughts

• What kind of a design was this?
  • A. Experiment
  • B. Natural Experiment
  • C. Non-experiment
Which of the following could be driving my results?

- A. Lawler’s bias
- B. Omitted variable bias
- D. Differential attrition
- E. Diffusion effects