Effect of Smoking on Mothers

Homework #1
Econometrics (01:220:322)
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Question

The question we will be trying to answer is does smoking have any effect on the weight of mothers. We will be using the language R to run calculations on collected data on mothers who smoke and who do not smoke. In addition, we will be constructing a hypothesis test and a confidence interval to observe the difference, if any.

Hypothesis Test

The null hypothesis is that there is no difference in the weight of smokers and non-smokers, and the alternative hypothesis is that there is a difference. Let S represent smokers and NS represent non-smokers. Also, let W represent Weight.

$$H_o: W_S = W_{NS}, H_a: W_S \neq W_{NS}$$

Table

	Mean	Standard Error	95% Confidence Interval
Non-Smoking Mothers	123.2848	0.7056122	(121.4745, 125.0951)
Smoking Mothers	113.6856	0.9236253	(112.3026, 115.0686)
Diff	9.5992 ***	----	(7.34202 11.85638)

- Mean, Standard Error, 95% Confidence Interval, and difference for smoking and non-smoking mothers
- *** The P value is $2.366*10^{16}$ that is lower than the significance value of 0.01.

Findings

Based on our t-test, we will be rejecting the null hypothesis due to our p-value of $2.366*10^{16}$ being lower than all the significance levels.

There is a correlation between smoking and the weight of mothers because the p-value is significantly low. However, correlation does not imply causation. The reason for this is that the correlation between smoking and weight of mothers does not imply causation and there may be some omitted factors that could be the real causes.