

# ECN 102, Spring 2020

Week 4 Section  
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## MT1, W18, Problem 2d

The variable `weeks` measures the number of weeks that an unemployed person is unemployed until finding another job.

KEY CRITICAL VALUES FOR THIS EXAM

$$t_{44,.005} = 2.692$$

$$t_{44,.01} = 2.414$$

$$t_{44,.025} = 2.015$$

$$t_{44,.05} = 1.680$$

$$t_{44,.10} = 1.301$$

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. summarize weeks
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Variable	Obs	Mean	Std. Dev.	Min	Max
weeks	45	15.48889	12.57274	0	50

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- If null is correct (i.e.  $\mu^* = \mu$ ), then  $T \equiv \frac{\bar{X} - \mu^*}{S/\sqrt{n}} \sim T(n-1)$ .
- If  $\mu^* = \mu$ , then  $t$  unlikely to be “far” from zero. If far, reject null.

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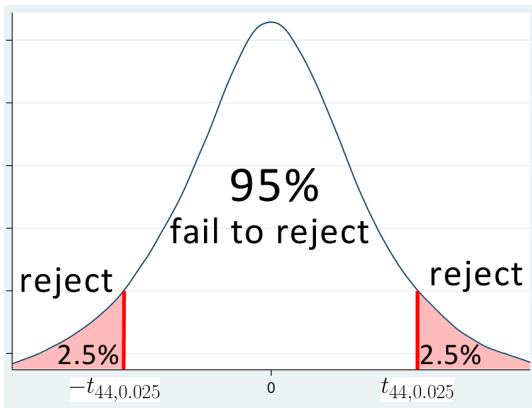
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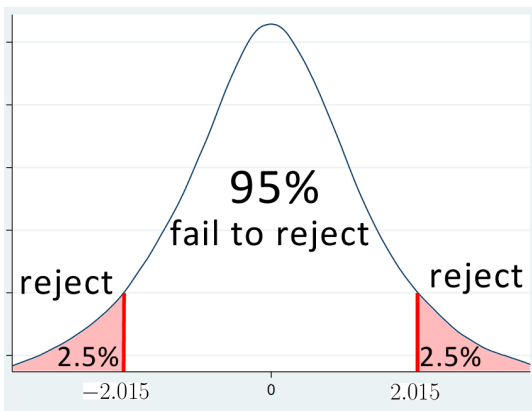




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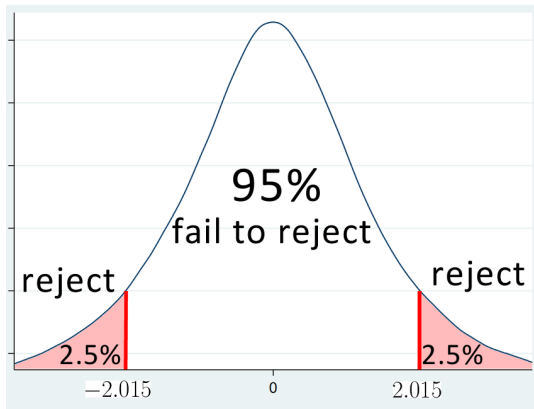
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- $| -2.4069 | > 2.015$ , reject the null at 5% significance

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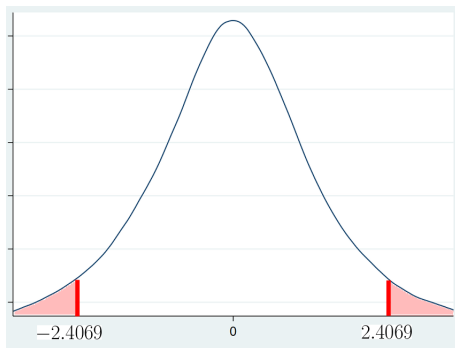
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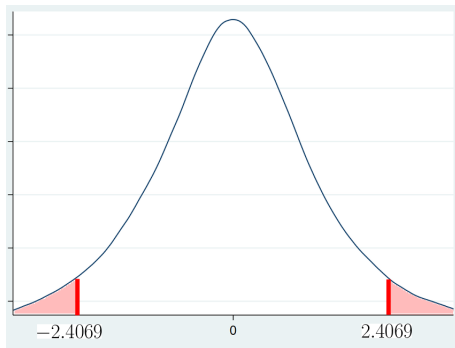
- $p$ -value tells you the probability of observing a  $t$ -statistic at least as extreme as the one we observe, if the null hypothesis were true
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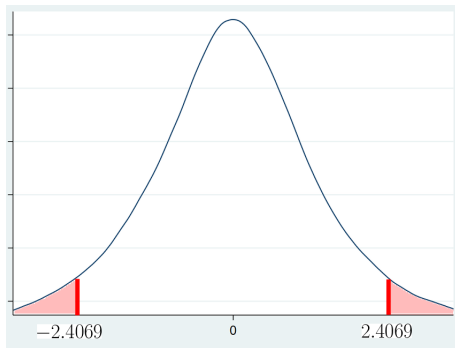


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- Equals  $p = .02$ , so reject at .10 and .05 but not .01 significance

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- If the interval probably contains  $\mu$  but doesn't contain  $\mu^*$ , then  $\mu^*$  is probably not  $\mu$
- Reject the null at 10% significance

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- The  $t$ -statistic is larger in magnitude than the  $t_{n-1, \alpha/2}$  critical value
- The  $p$ -value is less than  $\alpha$



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Thus we can only *fail to reject* the null; it is a logical mistake to *accept* it.