#### Asymptotics

- Consistency
- Asymptotic normality

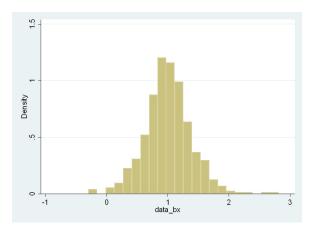
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### Consistency

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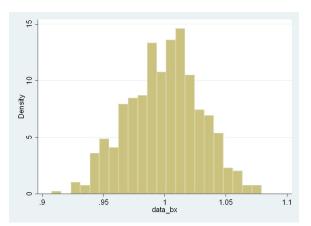
- n = 10, reps = 500,  $x \sim N(0, 1)$ ,  $u \sim N(0, 1)$
- y = 1 + x + u, distribution of  $\hat{\beta}_1$



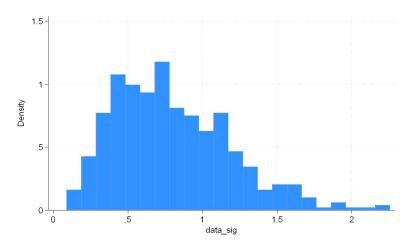
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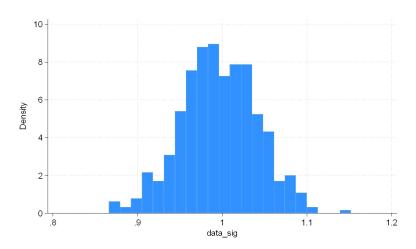
- n = 1000, reps = 500,  $x \sim N(0, 1)$ ,  $u \sim N(0, 1)$
- y = 1 + x + u, distribution of  $\hat{\beta}_1$



- n = 10, reps = 500,  $x \sim N(0, 1)$ ,  $u \sim N(0, 1)$
- y = 1 + x + u, distribution of SSR/n



- n = 1000, reps = 500,  $x \sim N(0, 1)$ ,  $u \sim N(0, 1)$
- y = 1 + x + u, distribution of SSR/n



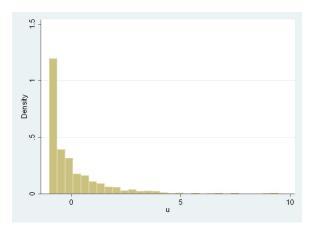
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### Asymptotic Normality

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• 
$$u \sim \chi^2(1) - 1$$

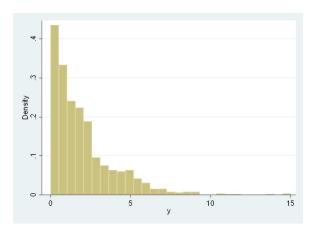




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• 
$$x \sim \chi^2(1)$$
,  $u \sim \chi^2(1) - 1$ 

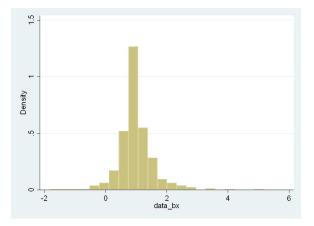
• 
$$y = 1 + x + u$$



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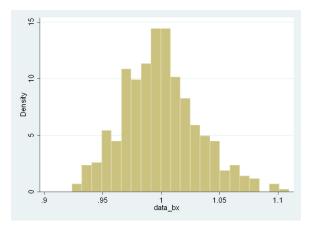
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- n = 10, reps = 500
- $x \sim \chi^2(1)$ ,  $u \sim \chi^2(1) 1$
- y = 1 + x + u



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- n = 1000, reps = 500
- $x \sim \chi^2(1)$ ,  $u \sim \chi^2(1) 1$
- y = 1 + x + u



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