Margin of Error 2

Monday, September 17, 2018 3:21 PM

Black Call Backs

$n = 2435$

$$\frac{157 \times 1 + 2278 \times 0}{2435} = 0.0645$$

$$s^2 = \frac{2278(0 - 0.0645)^2 + 157(1 - 0.0645)^2}{2435 - 1}$$

$$s^2 \approx 0.060344$$

$$s \approx \sqrt{0.060344}$$

$$s \approx 0.245650$$

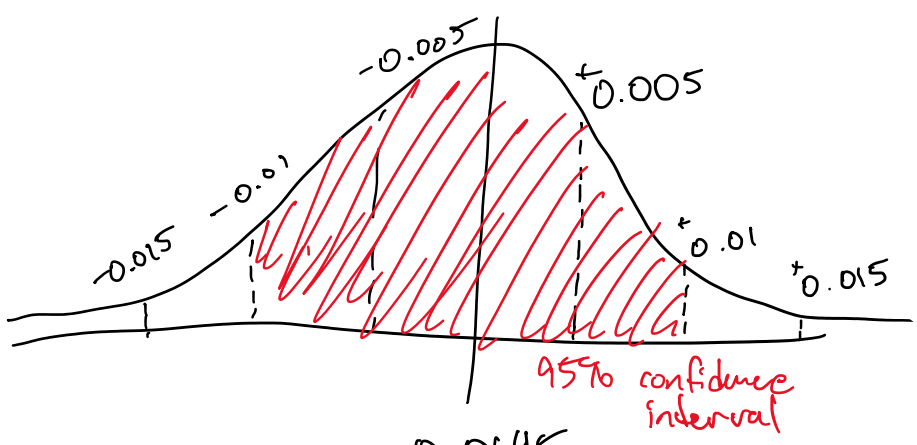
$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$$

$$\sigma_{\bar{x}} \approx \frac{s}{\sqrt{n}}$$

$$\sigma_{\bar{x}} \approx \frac{0.245650}{\sqrt{2435}}$$

$$\sigma_{\bar{x}} \approx 0.004978$$

$$\sigma_{\bar{x}} \approx 0.005$$



95% confidence interval is $P(\mu \text{ is within } 2\sigma \text{ of } \bar{x})$

1% margin of error

95% confidence interval 0.0645 ± 0.01 $(0.0545, 0.0745)$

White Call Backs

$$\frac{235 \times 1 + 2200.0 \times 0}{2435} = \frac{235}{2435} \approx 0.096509$$

$$s^2 = \frac{2200(0 - 0.096509)^2 + 235(1 - 0.096509)^2}{2435 - 1}$$

$s^2 = 0.087231$

$s = \sqrt{0.087231}$

$s = 0.295349$

$$\sigma_{\bar{x}} \approx \frac{s}{\sqrt{n}}$$

$$\sigma_{\bar{x}} \approx \frac{0.295349}{\sqrt{2435}}$$

$\sigma_{\bar{x}} \approx 0.005985$

$\sigma_{\bar{x}} \approx 0.006$

margin of error = 1.2%

95% confidence interval

$P(\mu \text{ is within } 2\sigma_{\bar{x}} \text{ of } \bar{x})$

0.097 ± 0.012

$(0.085, 0.109)$