

$$5a) \log\left(\frac{\hat{\pi}_i}{1-\hat{\pi}_i}\right) = \hat{\theta} \iff \frac{1}{1+\exp(-\hat{\theta})} = \frac{1}{1+\exp(0.9)}$$

$$b) \frac{\hat{\theta} - \theta - e_{s1}}{\sqrt{SE(\hat{\theta})^2 + \hat{\sigma}^2}} \sim N(0, 1)$$

$$\implies \Pr\left[-0.9 - 2\sqrt{0.1^2 + 0.05} \leq \theta + e_{s1} \leq -0.9 + 2\sqrt{0.1^2 + 0.05}\right] \approx 0.95$$

$$\implies -0.9 \pm 2\sqrt{0.06} \quad \text{APPROXIMATE 95\% INTERVAL}$$

For $\theta + e_{s1}$

$$\implies \frac{1}{1+\exp(0.9+2\sqrt{0.06})} \quad \text{To} \quad \frac{1}{1+\exp(0.9-2\sqrt{0.06})}$$

IS APPROXIMATE 95% PREDICTION INTERVAL FOR π_{s1} .