

$$c) \quad \log \left(\frac{\theta_{i2}}{\theta_{i1}} \right) = X_i' \beta_2$$

$$\Leftrightarrow \frac{\theta_{i2}}{\theta_{i1}} = e^{X_i' \beta_2}$$

$$\Leftrightarrow \theta_{i2} = \theta_{i1} e^{X_i' \beta_2}$$

$$\log \left(\frac{\theta_{i3}}{\theta_{i1}} \right) = X_i' \beta_3$$

$$\frac{\theta_{i3}}{\theta_{i1}} = e^{X_i' \beta_3}$$

$$\theta_{i3} = \theta_{i1} e^{X_i' \beta_3}$$

$$\theta_{i1} + \theta_{i2} + \theta_{i3} = 1$$

$$\Leftrightarrow \theta_{i1} + \theta_{i1} e^{X_i' \beta_2} + \theta_{i1} e^{X_i' \beta_3} = 1$$

$$\Leftrightarrow \theta_{i1} (1 + e^{X_i' \beta_2} + e^{X_i' \beta_3}) = 1$$

$$\Leftrightarrow \underline{\theta_{i1}} = \frac{1}{1 + e^{X_i' \beta_2} + e^{X_i' \beta_3}}$$

$$\theta_{i2} = \theta_{i1} e^{X_i' \beta_2}$$

$$\underline{\theta_{i2}} = \frac{e^{X_i' \beta_2}}{1 + e^{X_i' \beta_2} + e^{X_i' \beta_3}}$$

$$\underline{\theta_{i3}} = \theta_{i1} e^{X_i' \beta_3}$$

$$= \frac{e^{X_i' \beta_3}}{1 + e^{X_i' \beta_2} + e^{X_i' \beta_3}}$$

9) $\beta_0 = 1$ $\beta_1 = 0.5$ $x_i = 5$

i $\log(\hat{\mu}_i) = 1 + 0.5(5)$
 $\hat{\mu}_i = \exp(1 + 2.5)$
 $= 33.11$

ii $\sqrt{\hat{\mu}_i} = 3.5$
 $\hat{\mu}_i = 3.5^2$
 $= 12.25$

iii $\log\left(\frac{\hat{\mu}_i}{10}\right) = 3.5$
 $\frac{\hat{\mu}_i}{10} = 33.11$
 $\hat{\mu}_i = 331.1$

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