Cheat sheet:

$$\underset{\sim}{\theta} =$$

$$\beta_1 = \ln(\gamma)$$

$$\beta_2 = \nu\delta$$

$$\beta_3 = \nu(1-\delta)$$

$$\beta_4 = \rho\nu\delta(1-\delta)$$

$$\underset{\sim}{\theta} = \begin{cases} \gamma = e^{\beta_1} \\ \delta = \beta_2 / (\beta_2 + \beta_3) \\ \nu = \beta_2 + \beta_3 \\ \rho = \beta_4(\beta_2+\beta_3) / \beta_2\beta_3 \end{cases}$$

$$\frac{\partial \underset{\sim}{\theta}}{\partial \beta^T} = \begin{bmatrix} e^{\beta_1} & 0 & 0 & 0 \\ 0 & \beta_3/(\beta_2+\beta_3)^2 & -\beta_2/(\beta_2+\beta_3)^2 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & -\beta_3\beta_4/\beta_2^2\beta_3 & -\beta_2\beta_4/\beta_2\beta_3^2 & \beta_2+\beta_3/\beta_2\beta_3 \end{bmatrix}$$

$$\underset{\sim}{y} = X\underset{\sim}{\beta} + \underset{\sim}{e} \qquad \hat{\beta},\ \hat{\sigma}^2(X^TX)^{-1}$$

$$\underset{\sim}{\theta} = g(\underset{\sim}{\beta}) \qquad \hat{\theta} = g(\hat{\beta})$$

$$G = \frac{\partial g(\underset{\sim}{\beta})}{\partial \underset{\sim}{\beta}^T} \qquad \hat{G} = G(\hat{\beta})$$

$$\mathrm{Cov}(\hat{\theta}) = G^T \hat{\sigma}^2 (X^TX)^{-1} G$$