

0.1 CPJ's Three Propositions

Proposition 1

$$\mathbf{V}^{-1} = \begin{bmatrix} \nu^{ii} & \lambda'_i \\ \lambda_i & \Lambda_{[i]} \end{bmatrix}$$

$$\mathbf{V}_{[i]}^{-1} = \Lambda_{[i]} - \frac{\lambda_i \lambda'_i}{\lambda_i}$$

0.1.1 Proposition 2

$$(i) \quad \mathbf{X}_{[i]}^T \mathbf{V}_{[i]}^{-1} \mathbf{X}_{[i]} = \mathbf{X}' \mathbf{V}^{-1} \mathbf{X}$$

$$(ii) \quad = (\mathbf{X}' \mathbf{V}^{-1} \mathbf{Y})^{-1}$$

$$(iii) \quad \mathbf{X}_{[i]}^T \mathbf{V}_{[i]}^{-1} \mathbf{Y}_{[i]} = \mathbf{X}' \mathbf{V}^{-1} \mathbf{Y}$$

0.1.2 Proposition 3

This proposition is similar to the formula for the one-step Newtown Raphson estimate of the logistic regression coefficients given by Pregibon (1981) and discussed in Cook Weisberg.