$$\mathrm{QDR}_q = \frac{exp\left\{\mathrm{X}\beta_q\right\}}{1 + exp\left\{\mathrm{X}\beta_q\right\} + exp\left\{\mathrm{X}\gamma_q\right\}}$$

$$\mathrm{QPR}_q = \frac{exp\left\{\mathrm{X}\gamma_q\right\}}{1 + exp\left\{\mathrm{X}\beta_q\right\} + exp\left\{\mathrm{X}\gamma_q\right\}}$$