MLE (cont.)

$$L = P_{insured} \times P_{insured} \times (1 - P_{insured})$$

MLE finds $P_{insured}$ that maximizes L.

↳ an estimate of $P_{insured}$ that maximizes the likelihood of observing the data we obtain.

Value of $P_{insured}$ that maximizes $L = 2/3$

In case of Logit / Probit with $y = 0$ and $y = 1$

not insured   insured

$$P(y=1 \mid x) = G(\beta_0 + \beta_1 x)$$

$$L = G(\cdot) \times G(\cdot) \times [1 - G(\cdot)]$$

MLE : finds $\hat{\beta}_0$ and $\hat{\beta}_1$ that maximizes

L or $\log(L)$.

Interpretation

probit $\longrightarrow$ continuous x

$$\boxed{\frac{\Delta P(y=1 \mid x)}{\Delta x}} = (\text{std. normal density at } x)\,\beta_1$$

Logit $\longrightarrow$ cont. x

$$= (\text{logistic density at } x)\,\beta_1$$