Logit

Linear Prob. Model

$\ominus$ $\hat{p} \notin [0;1]$

$\ominus$ unrealistic assumptions about linear effect of X on p

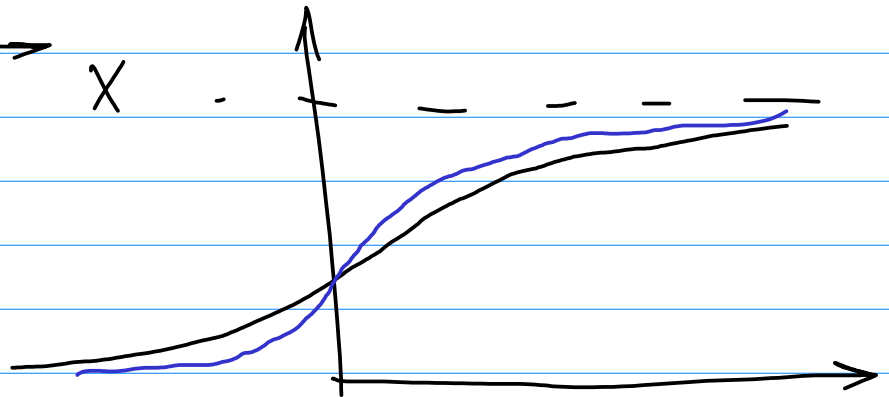$\ominus$ Heterosced.
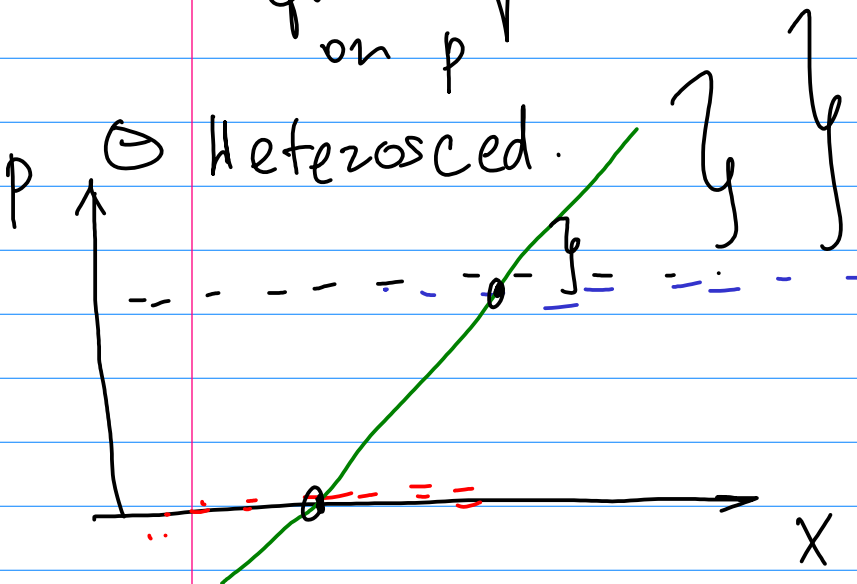
Logit

$\Lambda(X'\beta)$

$\uparrow$ linkage fun (GLM)

Probit

$\Phi(X'\beta)$

Gompit

$\Gamma(X'\beta)$

MLE properties $\hat{\theta}$
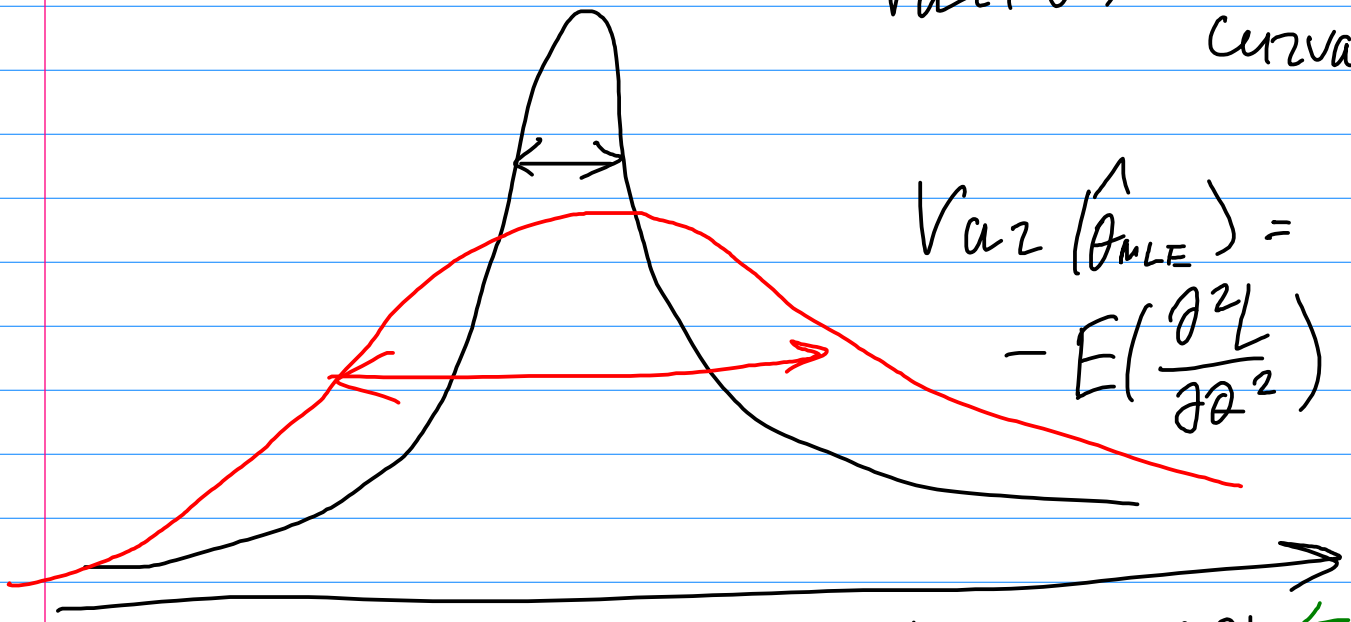
1) $E(\hat{\theta}) \xrightarrow[h \to \infty]{} \theta$

2) $\text{plim} \hat{\theta} \to \theta$

3) $\lim\limits_{n \to \infty} E(\tilde{\theta} - \theta)^2 \leq \lim\limits_{h \to \infty} E(\hat{\theta} - \theta)^2$

4) $\hat{\theta} \overset{d}{\sim} N(\theta; \text{Var}(\hat{\theta}))$
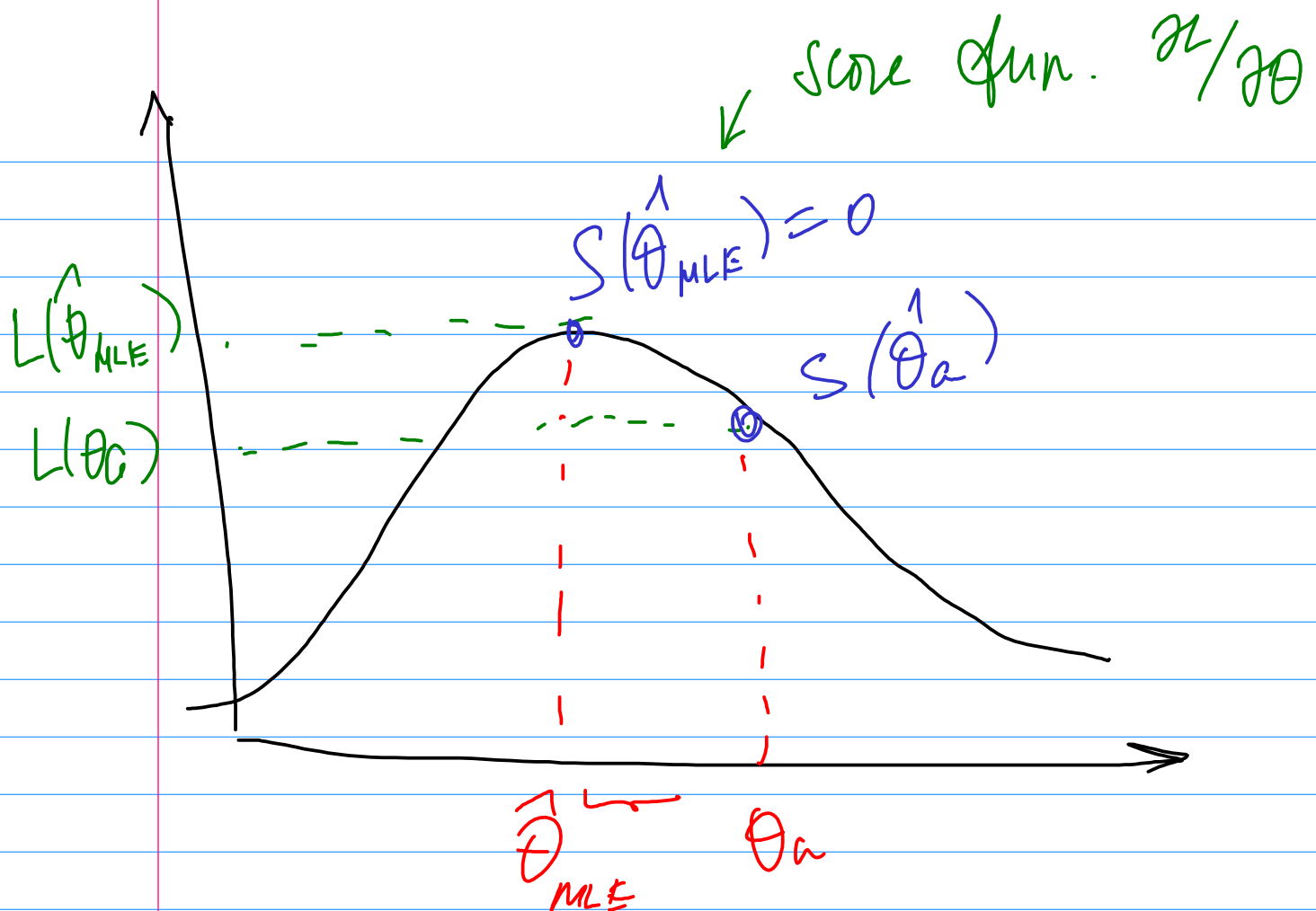
$$\text{Var}(\hat{\theta}) \geq \frac{1}{n \cdot I(\theta)}$$

$$\text{Var}(\hat{\theta}) \sim \frac{1}{\text{curvature}}$$

$$\text{Var}(\hat{\theta}_{MLE}) = -E\left(\frac{\partial^2 L}{\partial \theta^2}\right)$$

$$\text{Var} 2(\hat{\theta}_{MLE}) = E\left(\frac{\partial L}{\partial \theta}\right)^2 = \text{Var}\left(\frac{\partial L}{\partial \theta}\right) \Big\} \leftarrow \text{score} \quad \text{fun}$$

$\downarrow$ Score fun. $\frac{\partial \mathcal{L}}{\partial \theta}$

$S(\hat{\theta}_{MLE}) = 0$

$S(\hat{\theta}_a)$

$L(\hat{\theta}_{MLE})$

$L(\theta_G)$

$\hat{\theta}_{MLE}$

θ_a

$W \geq LR \geq LM$ for linear restrictions