risky

$$\frac{Z_{\xi}(0,T)}{Z_0(0,T)} = e^{-\int_0^T d_s \, ds}$$

risk-free bond

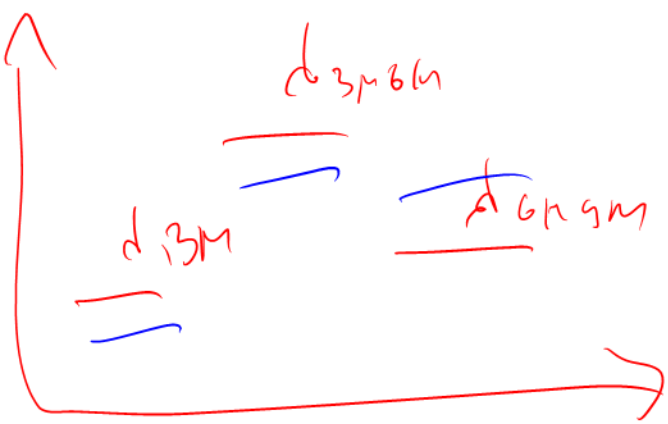
$$= e^{-rT} \, e^{-\int_0^T d_s \, ds}.$$

Hazard Rate d_s

- constant
- piecewise constant (IMP fitting)
- stochastic process (CIR, OU)

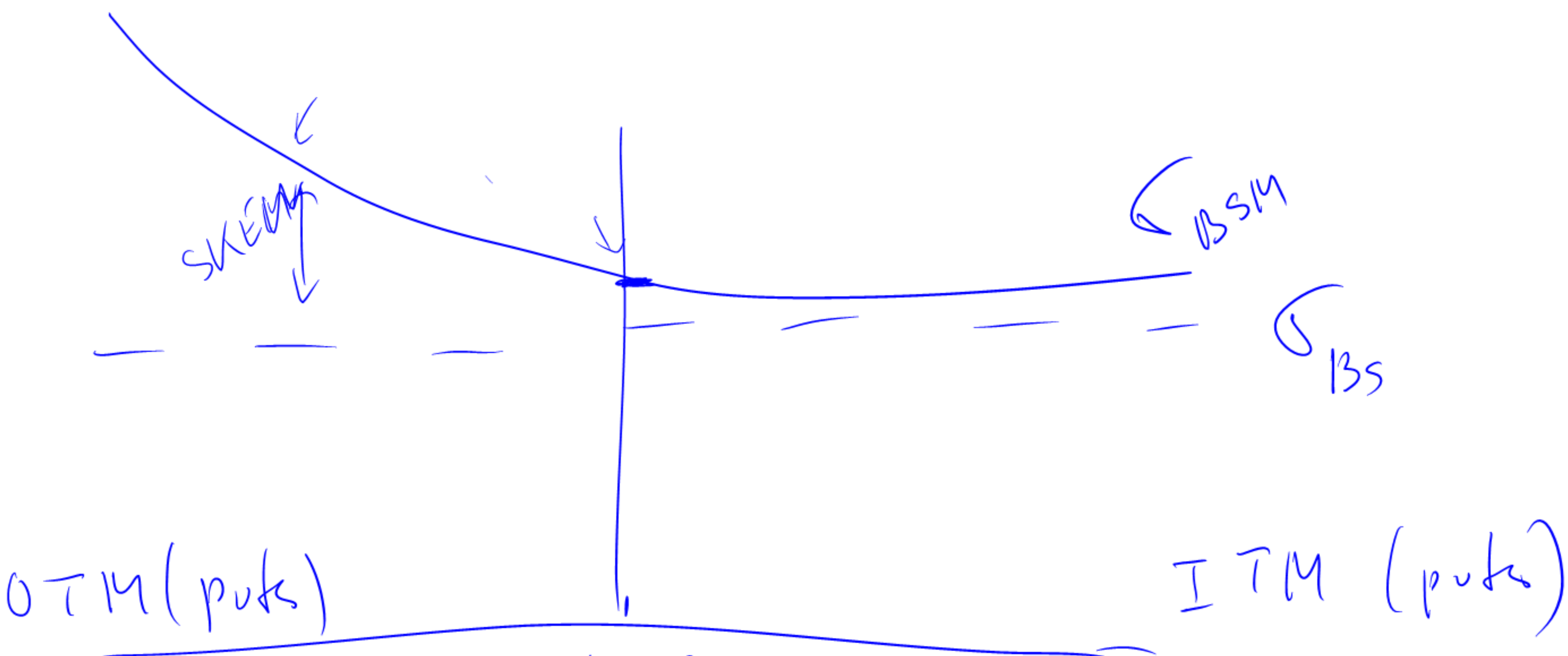
3M, 6M, 9M, 12M

$Z_M(0;3M)$



$$\frac{dV}{dt} + \frac{1}{2} S^2 \sigma^2 \frac{d^2V}{dS^2} + (r+p)\frac{dV}{dS} - (r+p)V = 0$$

Merton Model

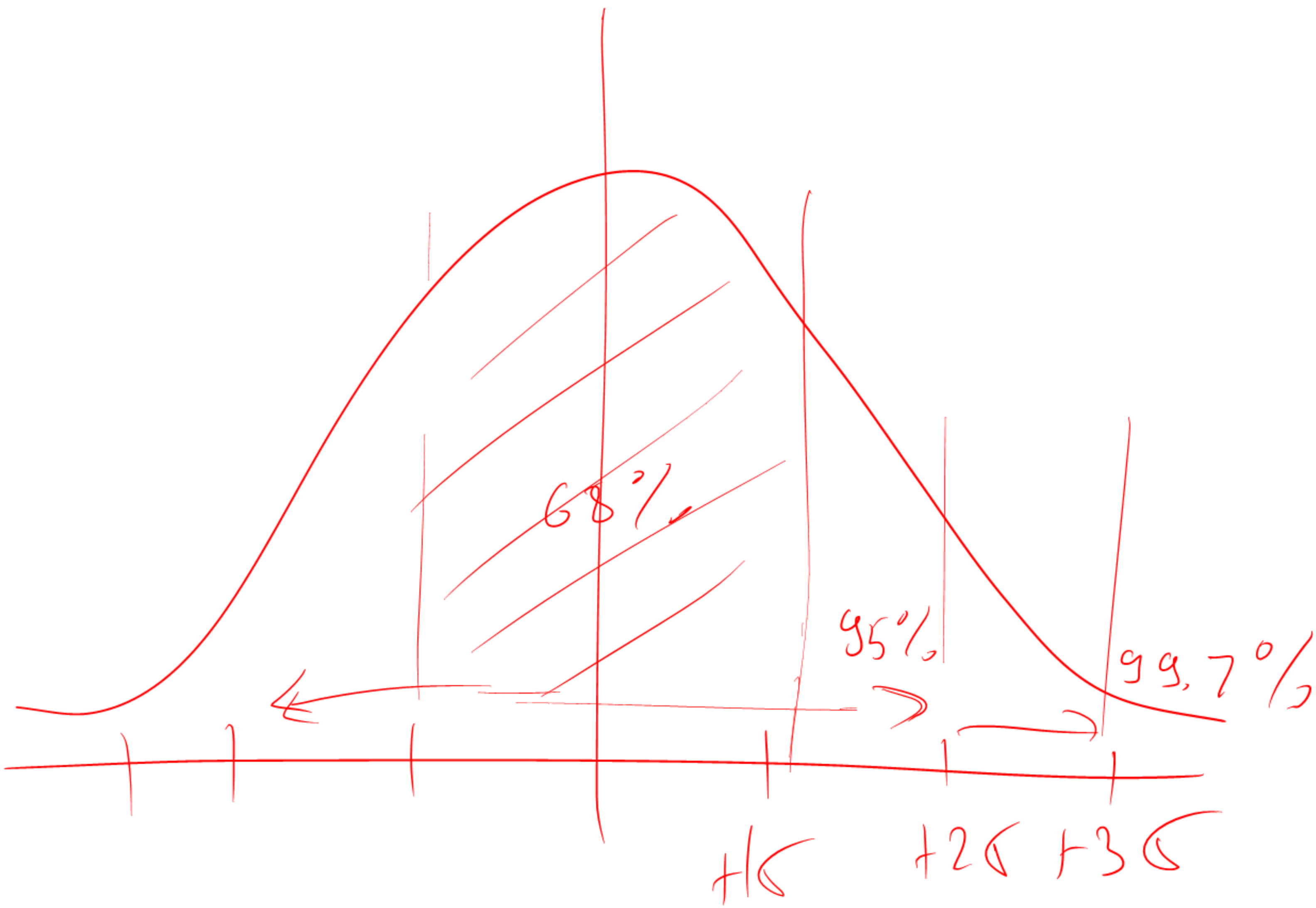


$k = S_t$ (100)

$$\log(S_t/K) = 0$$

Moneyness

Normal RV



Link function

Logit

$$g(p) = \log \frac{p}{1-p}$$

Get p $\quad g(g(p))^{-1} = p$

$$e^g + 1 = \frac{\cancel{p}}{1-p} + \frac{1-\cancel{p}}{1-p} = \frac{1}{1-p}$$

$$\underbrace{\frac{e^g + 1}{e^g + 1}}_{1} - p = \frac{1}{e^g + 1} \Rightarrow p = \frac{e^g}{e^g + 1}$$

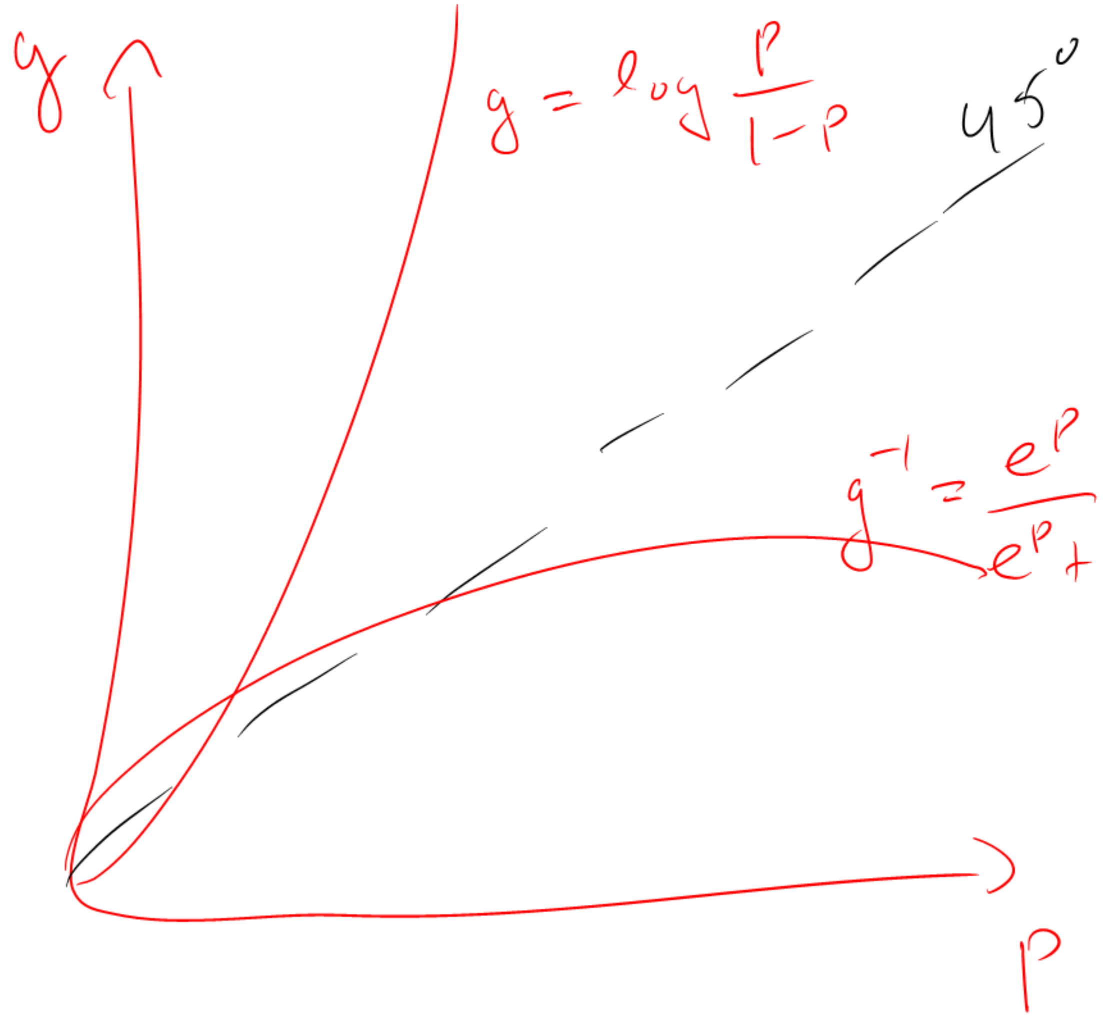
Logistic

$$g(p) = X\beta'$$

$$p = \frac{e^{X\beta'}}{e^{X\beta'} + 1}$$

$$g(p)^{-1} = \frac{e^p}{e^p + 1}$$

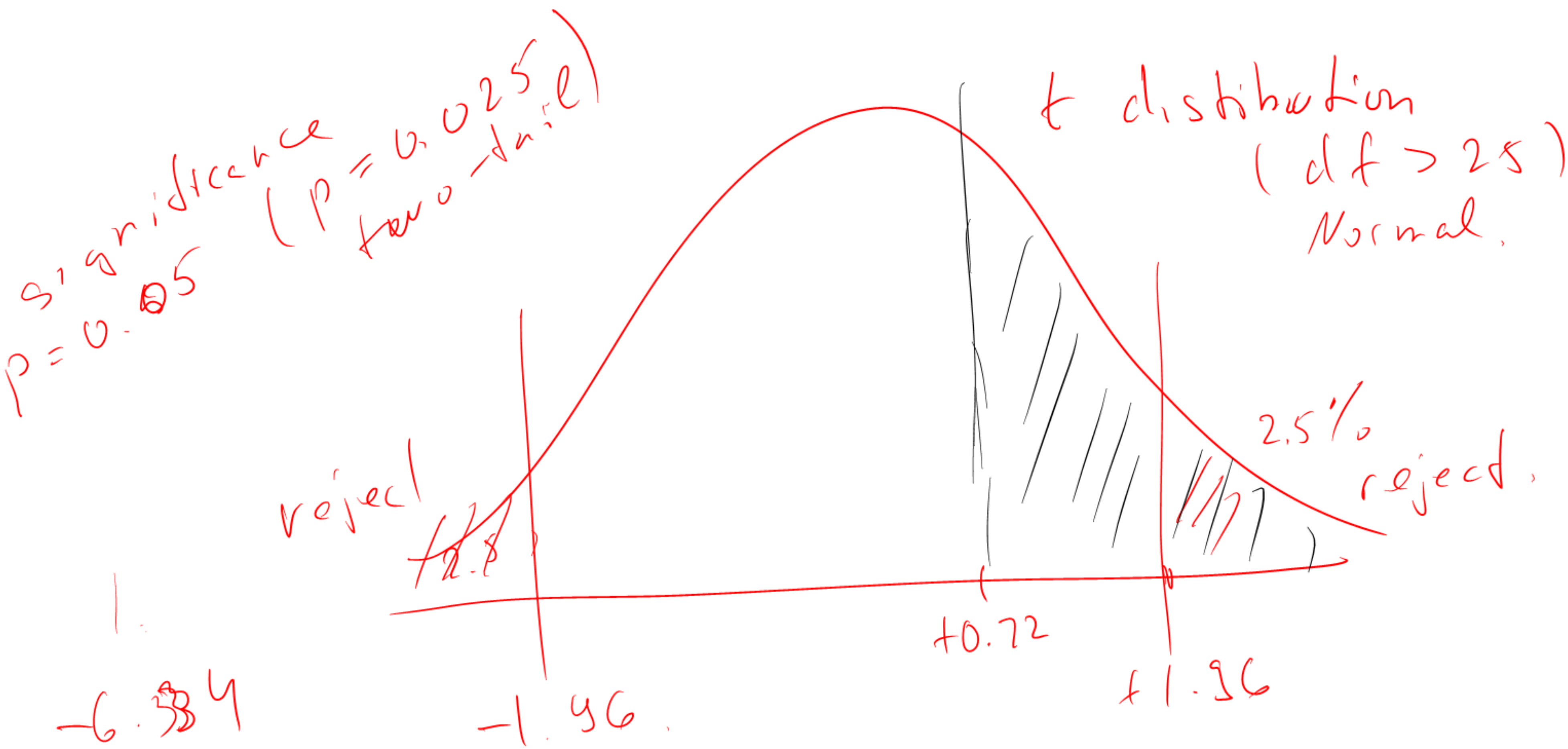
$$g(p) = \log \frac{p}{1-p}$$



HT for significance of β

$H_0: \beta_i = 0$

$H_1: \beta_i \neq 0$



HT for model choice

$H_0: \ell^{M1} - \ell_0^{M2} = 0$ "no difference"

$H_1: \ell - \ell_0 \neq 0$

$2(\ell - \ell_0) \sim \chi^2$