

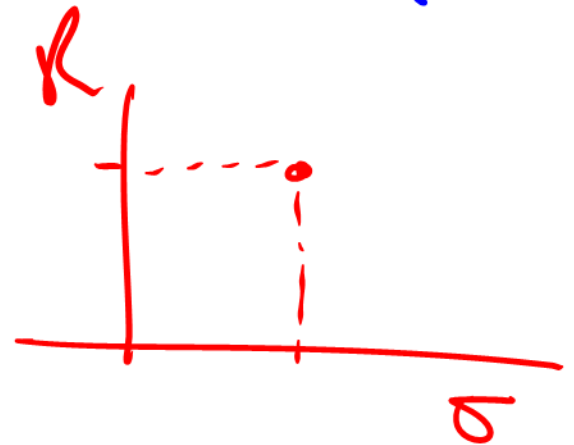
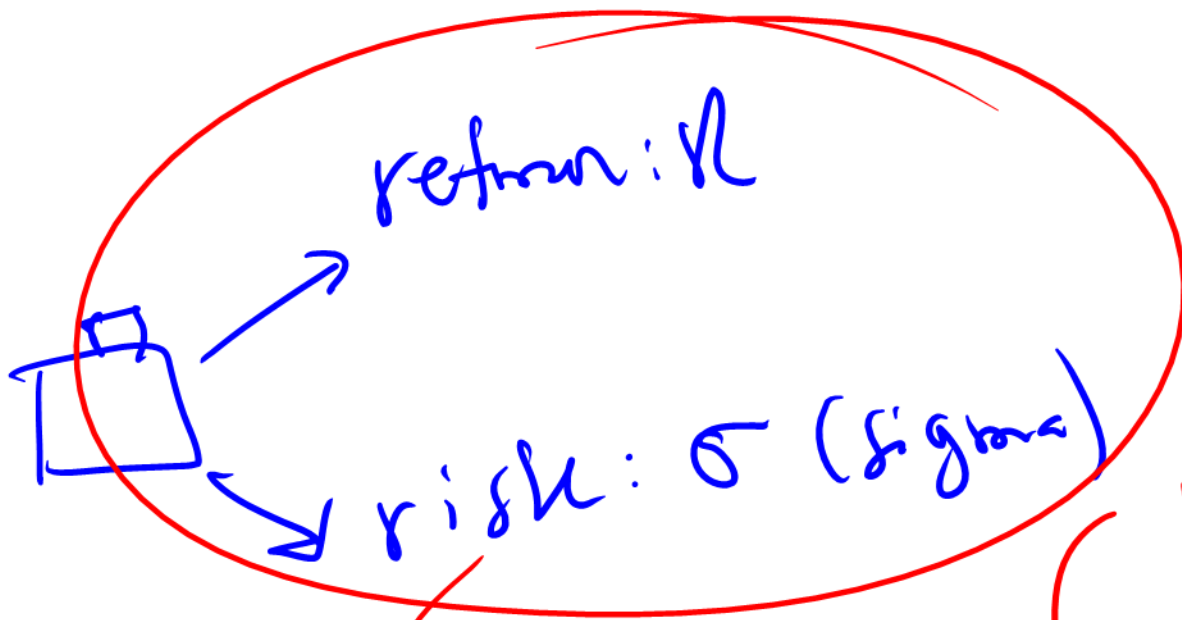
Risk: Markowitz (1951)

+

↳ Modern Portfolio Theory

(MPT)

Nobel Prize





R_π

=

Stock
 W_1

A

+

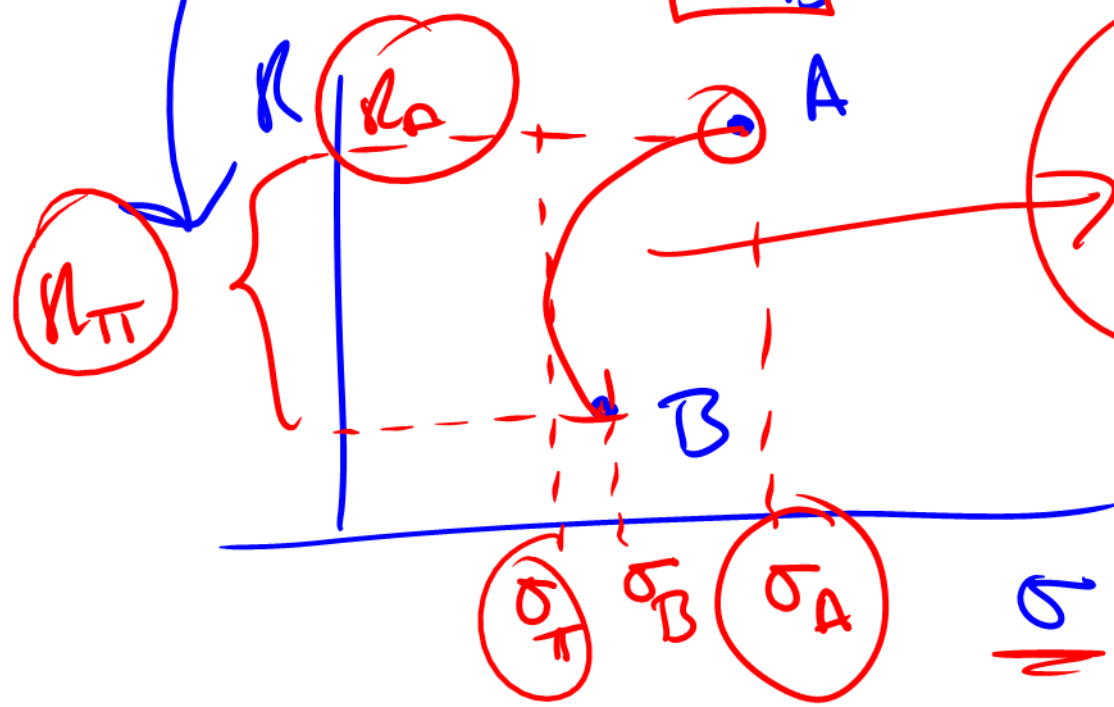
Bond
 W_2

B

R_A
 σ_A

R_B
 σ_B

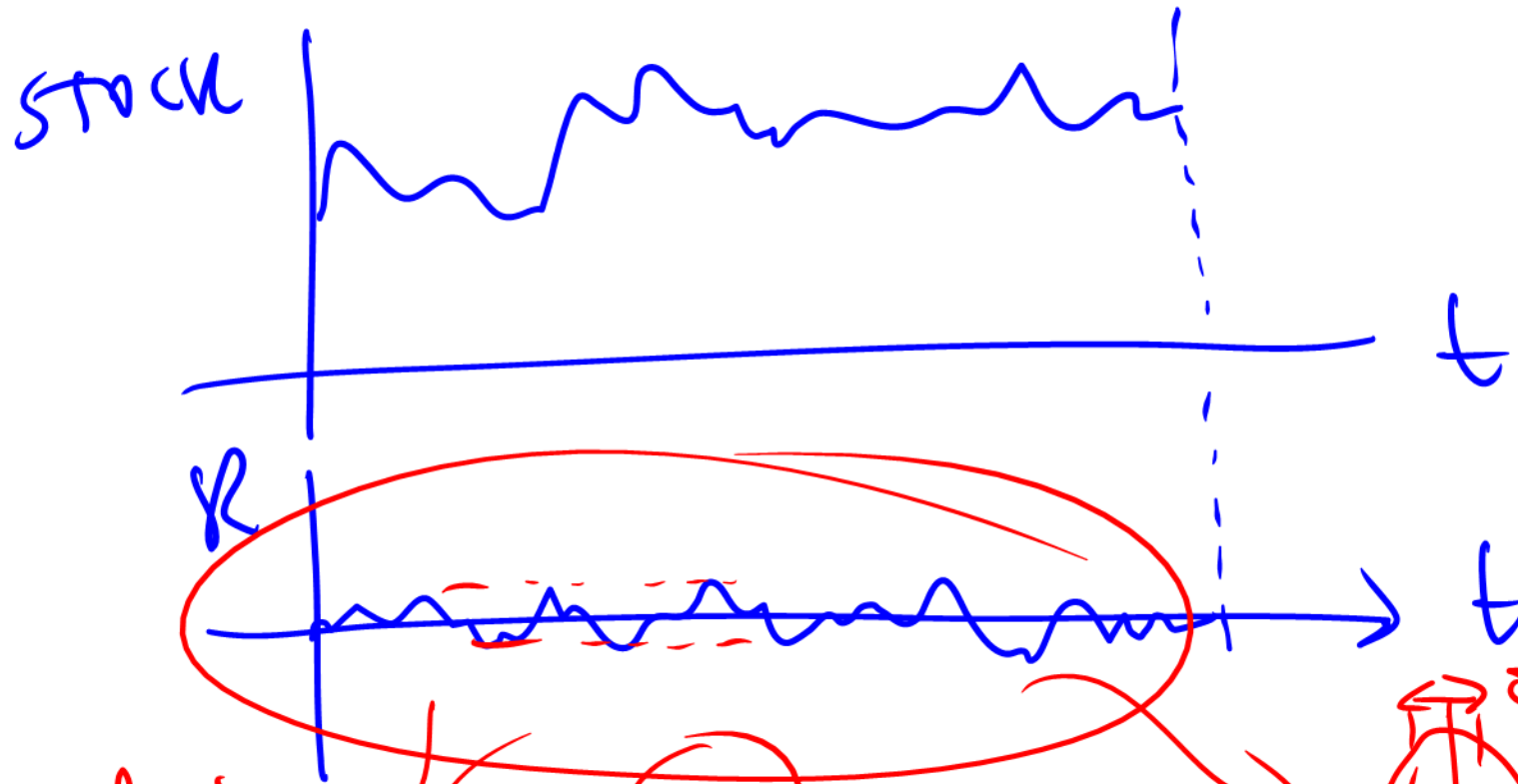
MPT



diversification
risk???

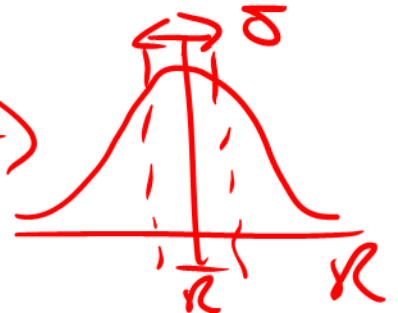
risk \rightarrow uncertainty

$\ln \tau$



$\sigma_A = \text{std dev}$

$$\bar{R} = R_A$$



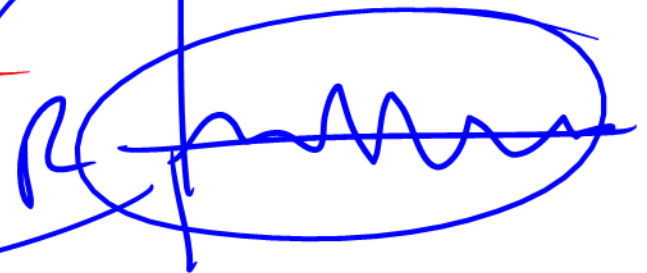
Edwin Hurst → Aswan
Egypt

~1930's

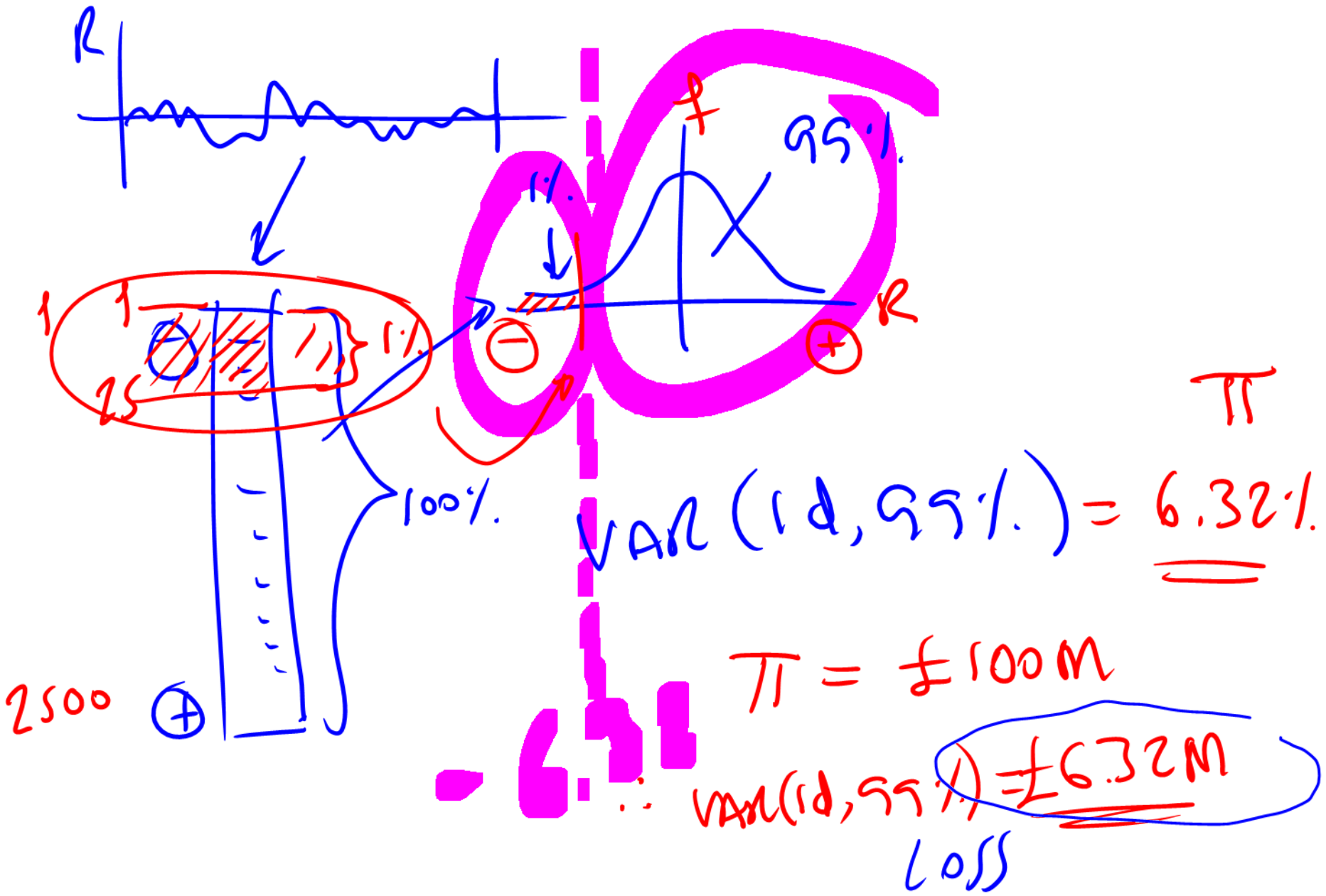
fractal

Nile

\$



H: Hurst



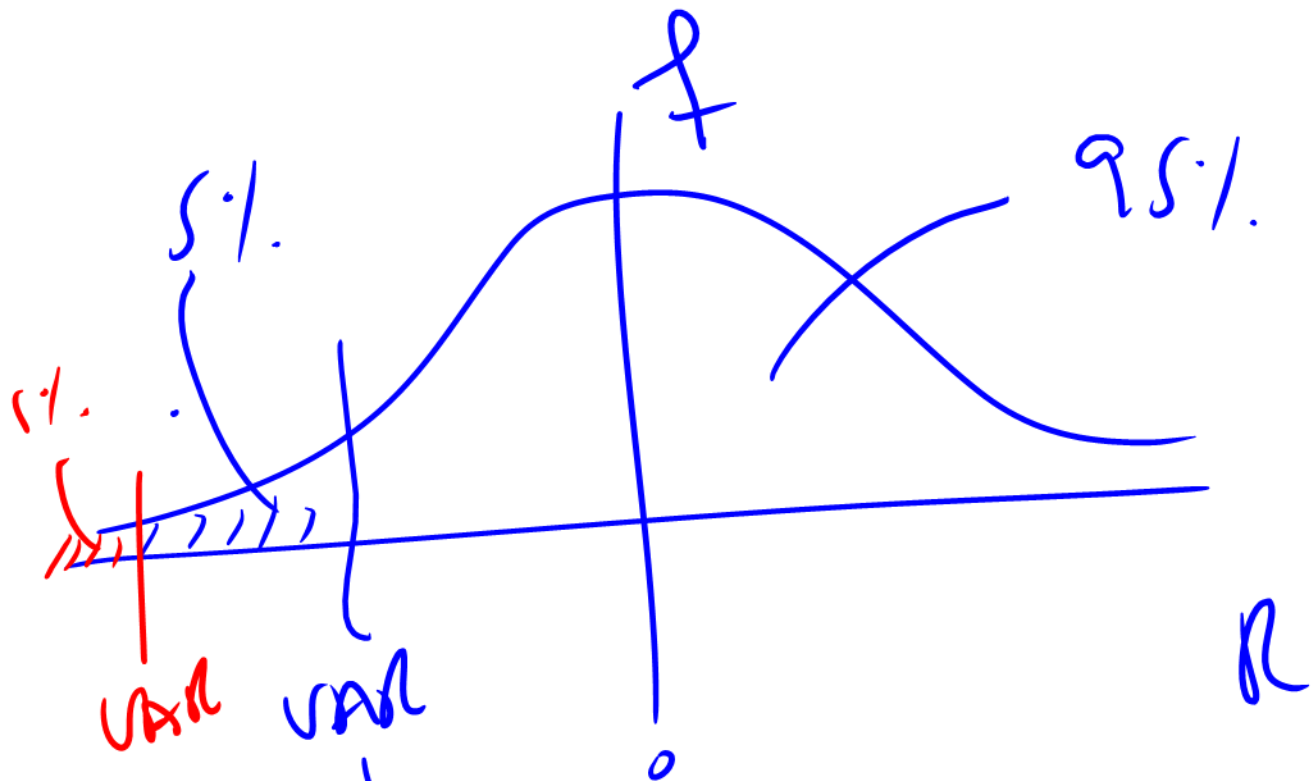
$$R = \frac{\Delta \pi}{\pi}$$

$$\rightarrow \frac{\Delta S}{S}$$

GBM / EQ:

$$dS = \mu S dt + \sigma S dW$$

$$\frac{dS}{S} = \mu dt + \sigma dW$$



$\text{varl}(id, 95\%)$

Top 5% sorted return

5% of 2500
 $25 \times 5 = \underline{\underline{125}}$