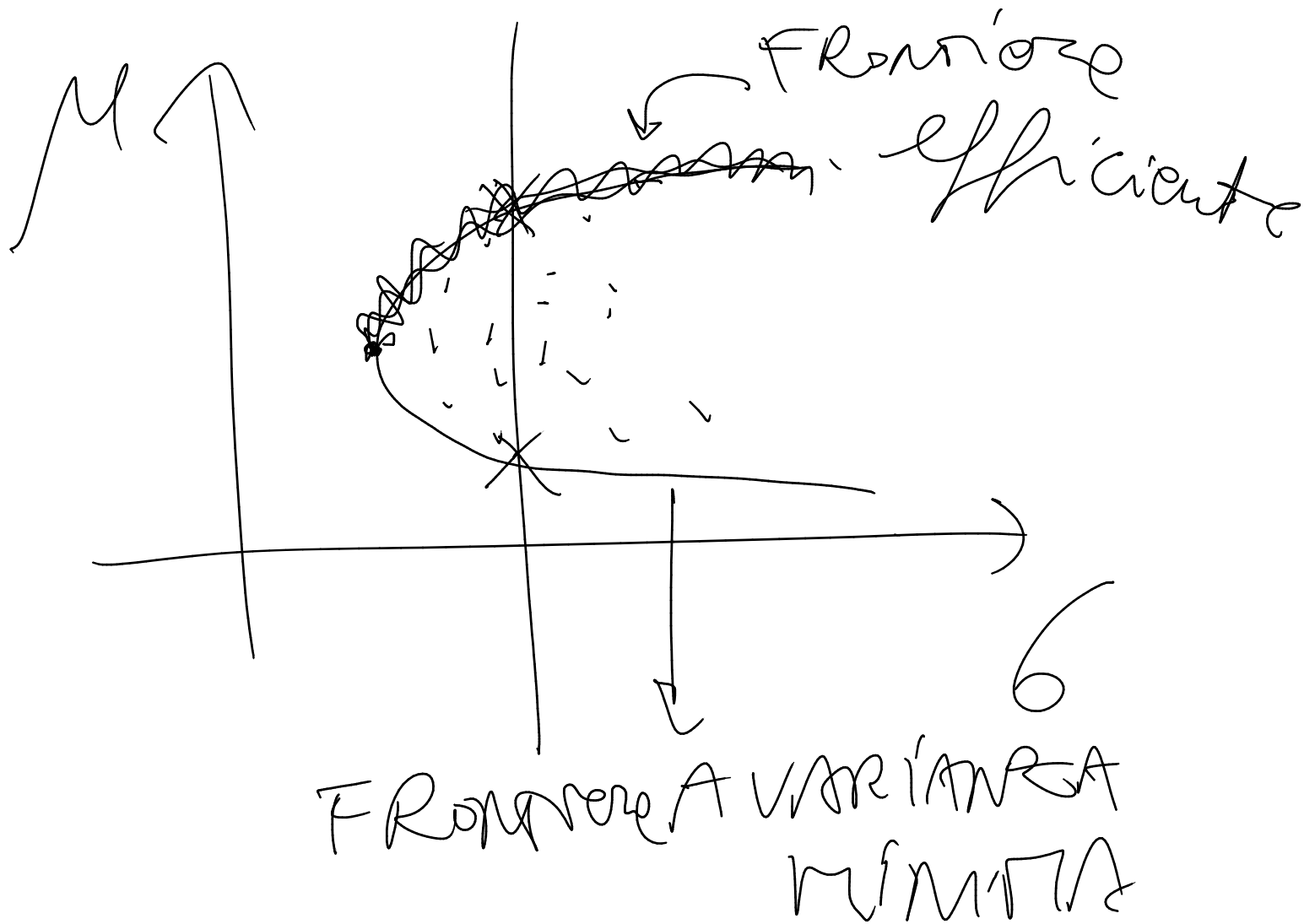


6M

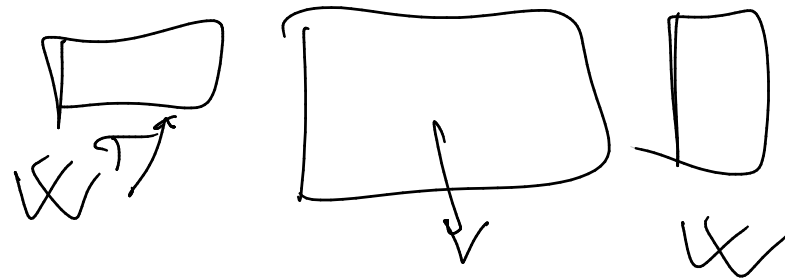




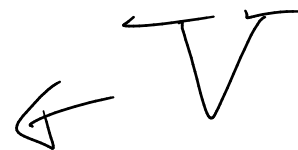
$$\min \frac{1}{2} \underbrace{W^T V W}$$

VARIANZA DI PORTAF

$W$  peso di portaf



MATRICE  
VAR-COV



d.t. vincolo

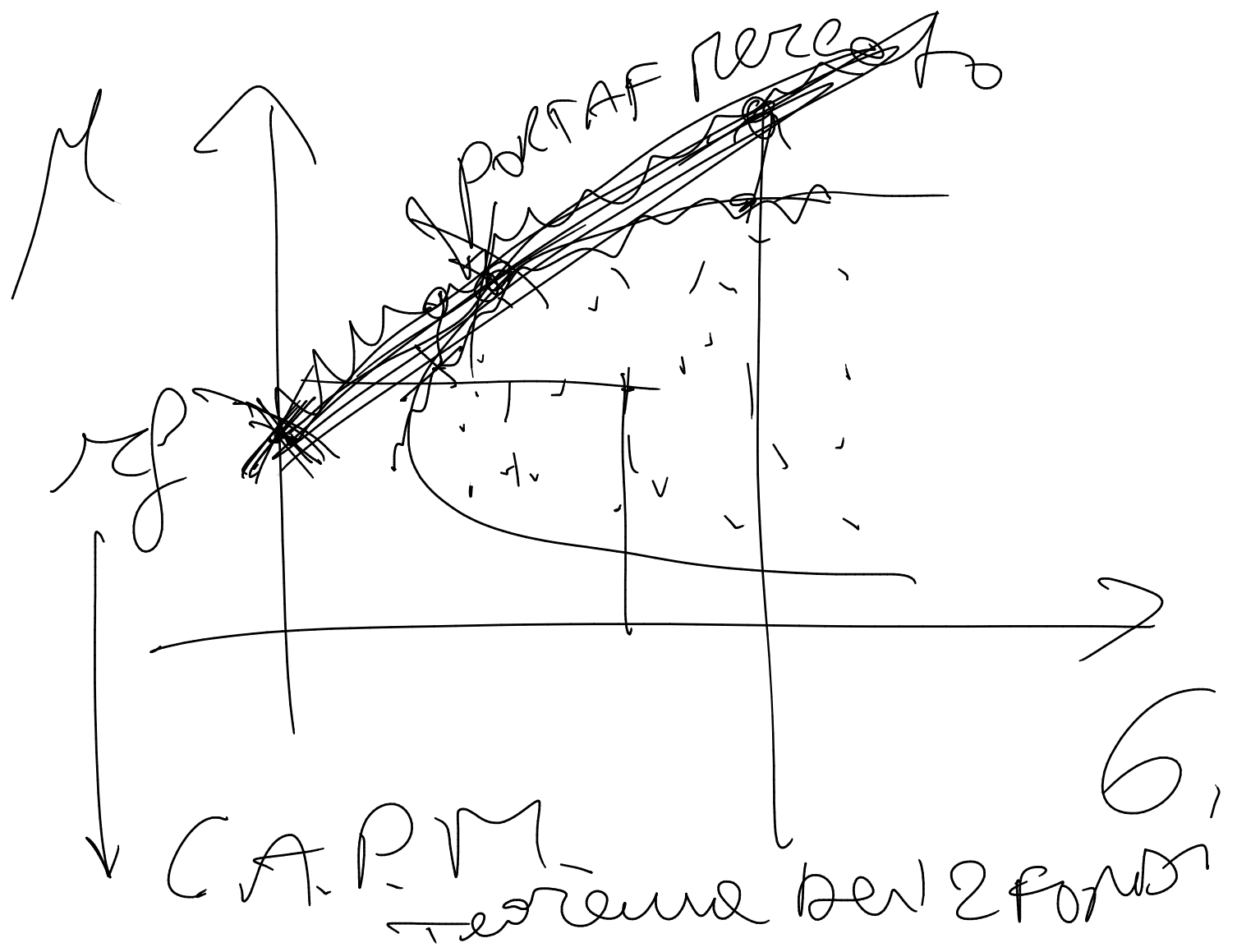
R = vettore  
rend.  
medi

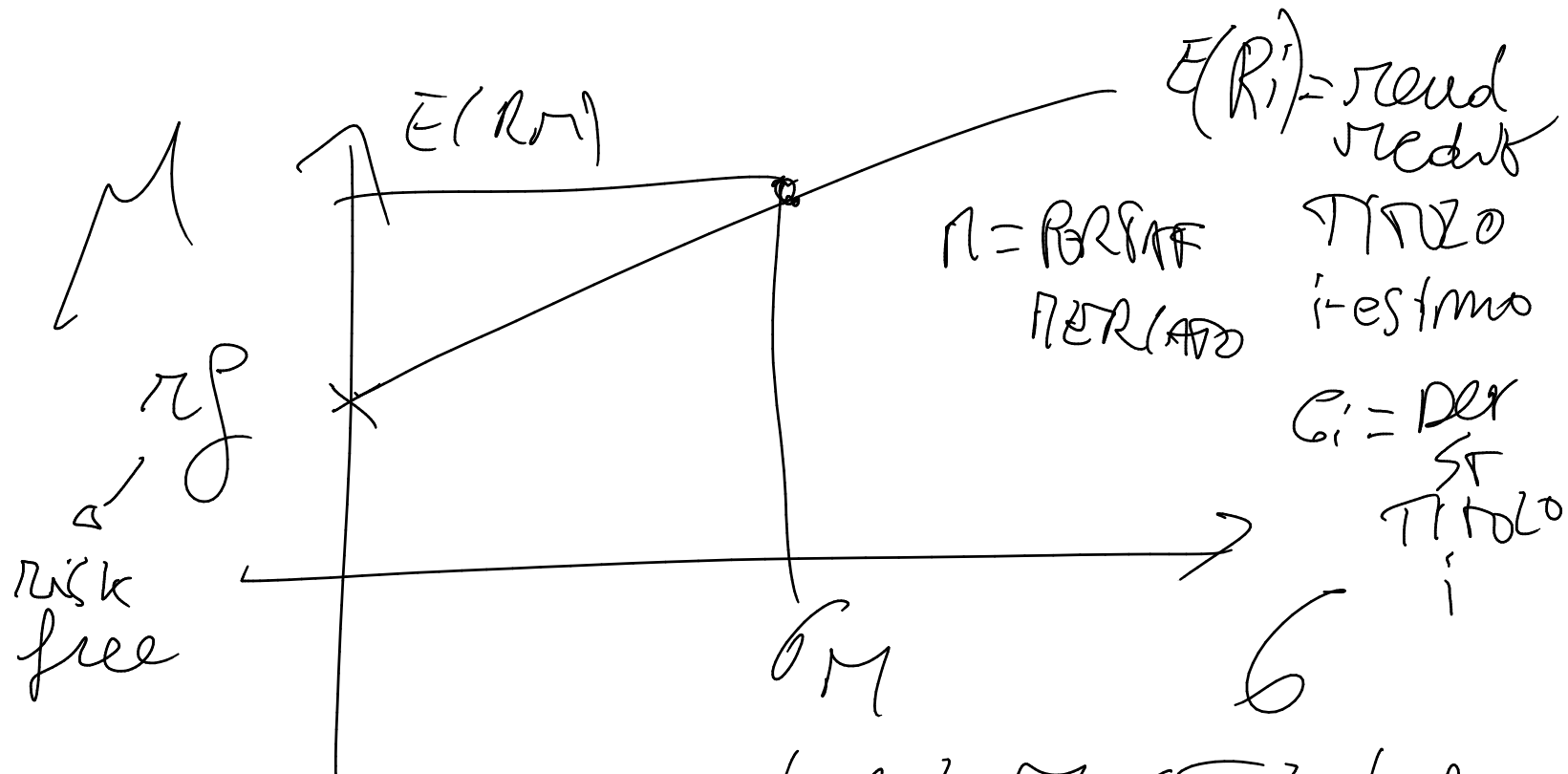
$$w^T R + (1-w^T) r_f = \mu$$



↓  
COSTANTE

↳ TASSO  
RISK  
FREE





CAPITAL MARKET LINE

Tutti PORTAF efficienti ↗

$$E(R_i) = r_f + \left( \frac{E(R_M) - r_f}{\sigma_M} \right) \cdot \sigma_i$$

$$E(R_i) - r_f = \text{premio al rischio}$$

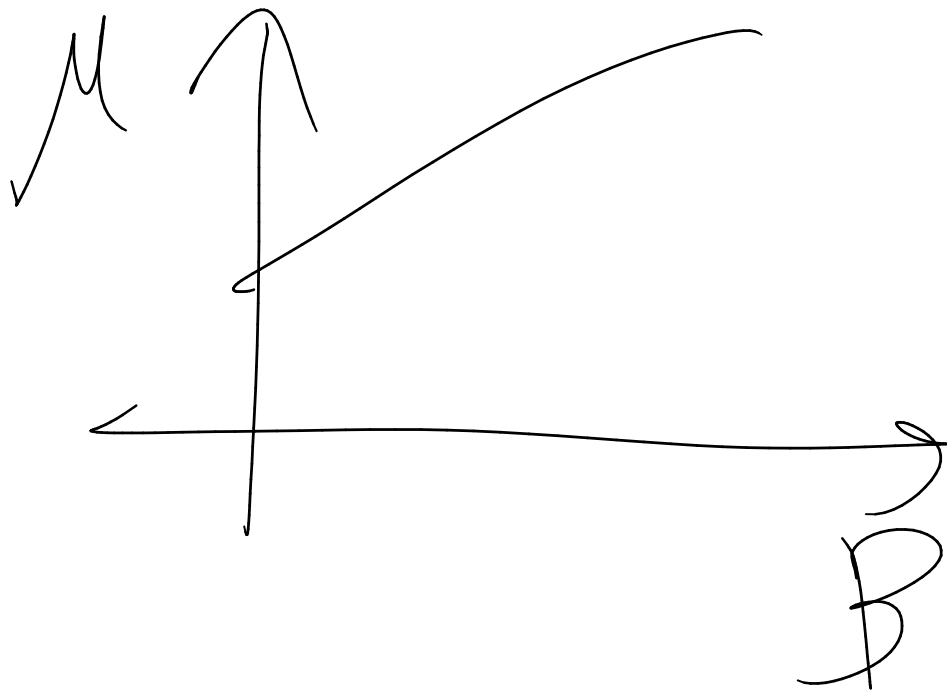
$\uparrow$

$$= \left( \frac{E(R_i) - r_f}{\sigma_M} \right) \cdot \sigma_i$$

PREZIO

RISCHIO

$$E(R_i) = r_f + [E(R_M) - r_f] \beta$$



Beta



$$E(R_i) - r_f = [E(R_M) - r_f] \cdot \beta_i$$

S.M.L.

$$\beta_i = \frac{\text{COV}(R_i, R_M)}{\text{VAR}(R_M)}$$

$$\beta_i = \frac{\rho_{iM} \cdot \sigma_i \cdot \sigma_M}{\sigma_M^2}$$

$$E(R_i) = r_f + \beta [E(R_M) - r_f]$$

$$E(R_i) = r_f + \frac{[E(R_M) - r_f]}{\sigma_M} \left( \frac{\rho_{iM} \sigma_i}{\sigma_M} \right)$$

$$E(R_i) - r_f =$$

premio  
rischio

prezzo

quantità  
rischio

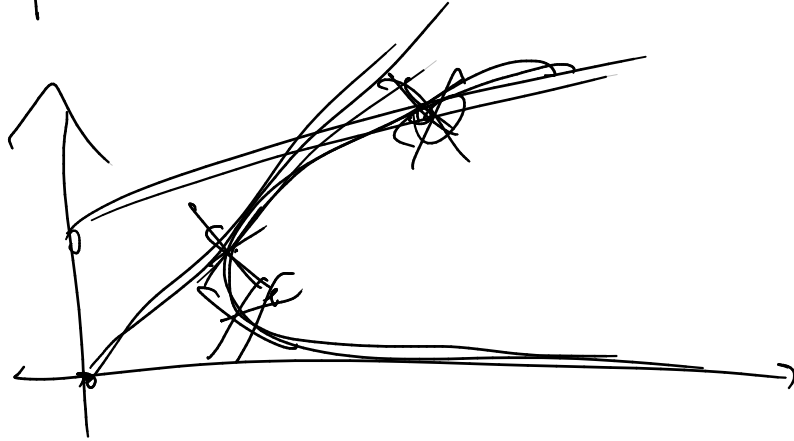
$$\mathbf{Z} = \mathbf{V}^{-1} [\mathbf{R} - \text{costante}]$$

$$X_i = \frac{Z_i}{\sum Z_i}$$

$$\sum Z_i$$

inversa log-conv.

vettoze - cost  
renda  
resid



CON I DUE PORTAFOGGI A

VARIANZA MINIMA

~~ATTENZIONE~~ CON  $\text{COST} = 0$

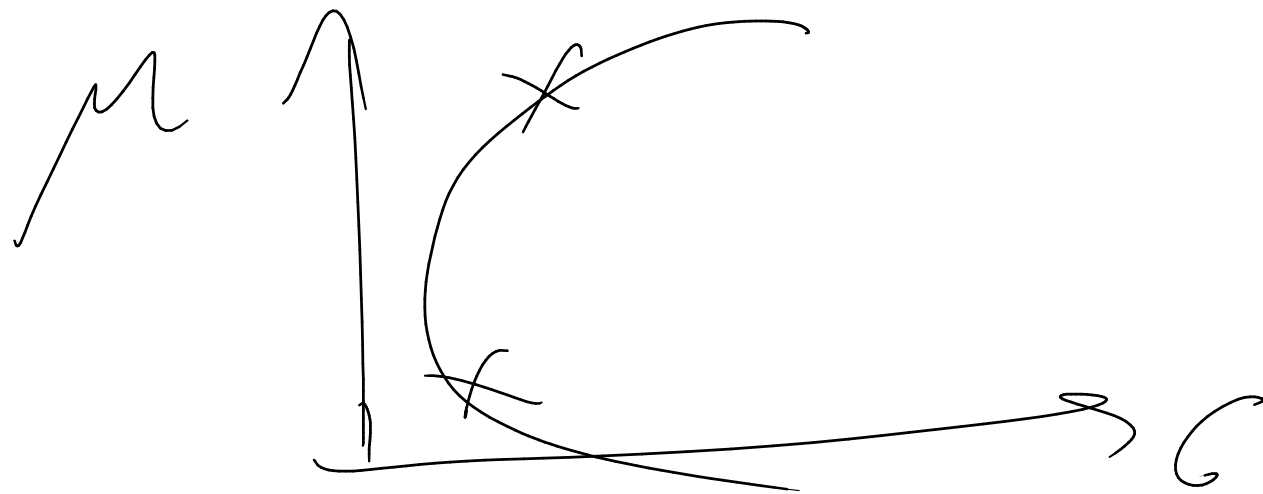
$\text{COST} = 0,1$

TROVO DENSITA' E MEDIA E

FACCIO COMBINAZIONE LINEARE

$$\alpha \cdot \text{PREF} + (1-\alpha) \text{PREF}$$

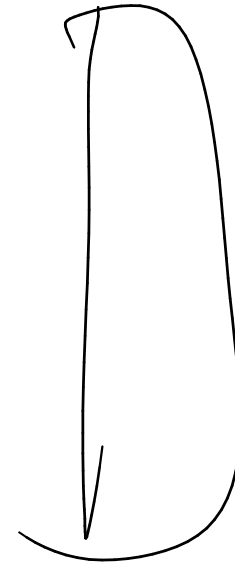
Tabelle rot!



redire



vettore  
map

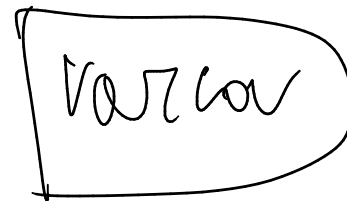


vett  
red

verba



vett  
map



vett  
map

Con

