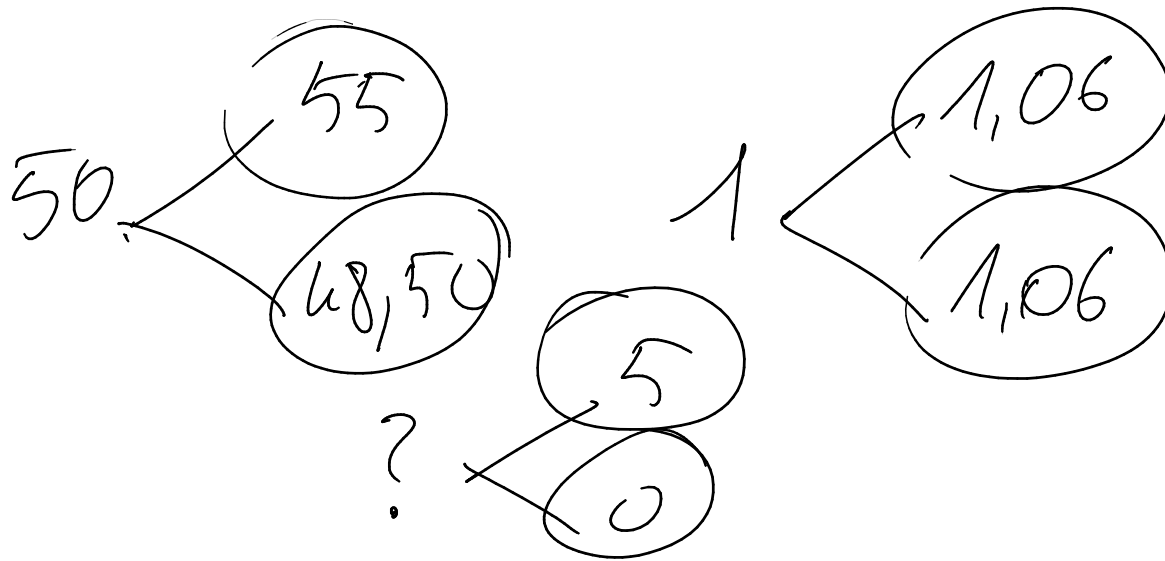


PREVING BINA FWA CE:

investo (N_1) Azioni

(N_2) Obbligaz

CALL = PORTAF
di Azioni e
Obbligaz



$$\begin{cases} N_1 \cdot 55 + N_2 \cdot 1,06 = 5 \\ N_1 \cdot 48,5 + N_2 \cdot 1,06 = 0 \end{cases}$$

Pressure Cell = $N_1 \cdot 50 + N_2 \cdot 1 = b$

$$\begin{pmatrix} 55 & 1,06 \\ 48,5 & 1,06 \end{pmatrix} \begin{pmatrix} N_1 \\ N_2 \end{pmatrix} = \begin{pmatrix} 5 \\ 0 \end{pmatrix} = b$$

$$\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = [A^{-1}] \cdot [b]$$

PROBABILITĂȚI RISK NEUTRAL:

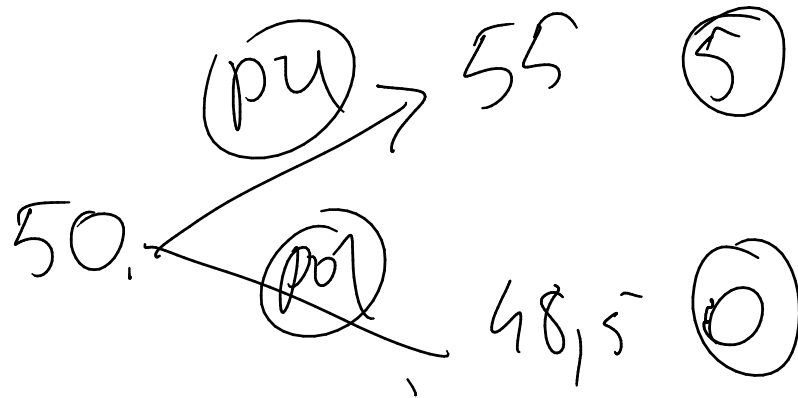
$$\left\{ \begin{aligned} S &= \left[S_u \cdot p_u + S_d \cdot p_d \right] \frac{1}{1+r} \\ 1 &= \left[\cancel{(1+r)} \cdot p_u + \cancel{(1+r)} p_d \right] \frac{1}{\cancel{1+r}} \end{aligned} \right.$$

$$\begin{aligned}
 & \begin{cases} 1+r = u \cdot p_u + d \cdot p_d \\ 1 = p_u + p_d \end{cases} \\
 & \stackrel{A}{=} \begin{bmatrix} u & d \\ 1 & 1 \end{bmatrix} \begin{bmatrix} p_u \\ p_d \end{bmatrix} = \begin{bmatrix} 1+r \\ 1 \end{bmatrix} \quad \begin{bmatrix} p_u \\ p_d \end{bmatrix} = A^{-1} \cdot b
 \end{aligned}$$

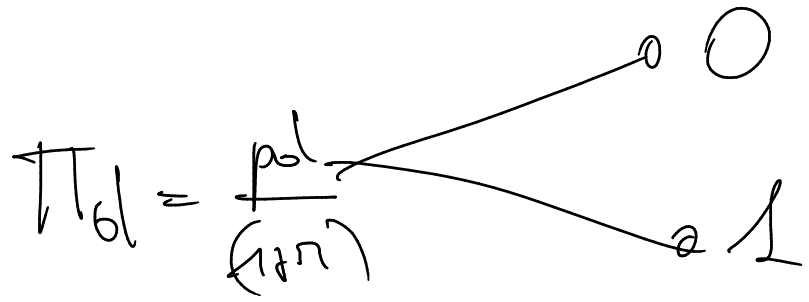
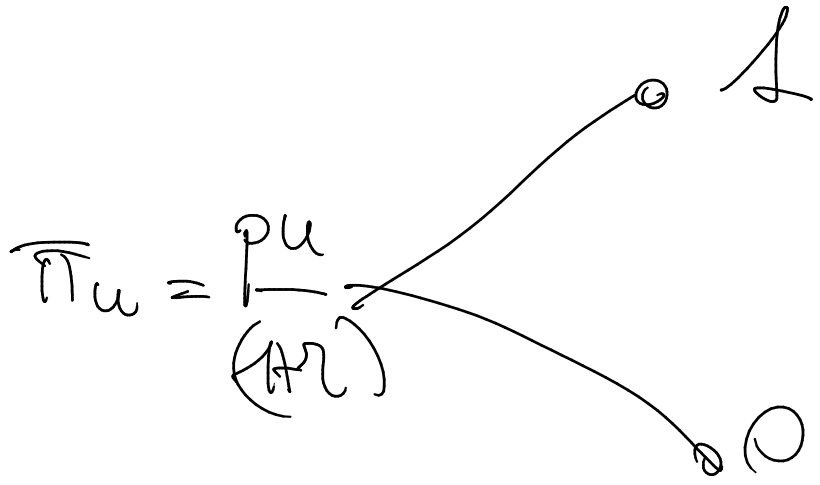
$$\text{present call} = \left[\text{pu} \cdot 5 + \text{pd} \cdot 0 \right] \frac{1}{1+r}$$

payoff
call
up

payoff
call
down



ARROW-DEBREAU PRICES =

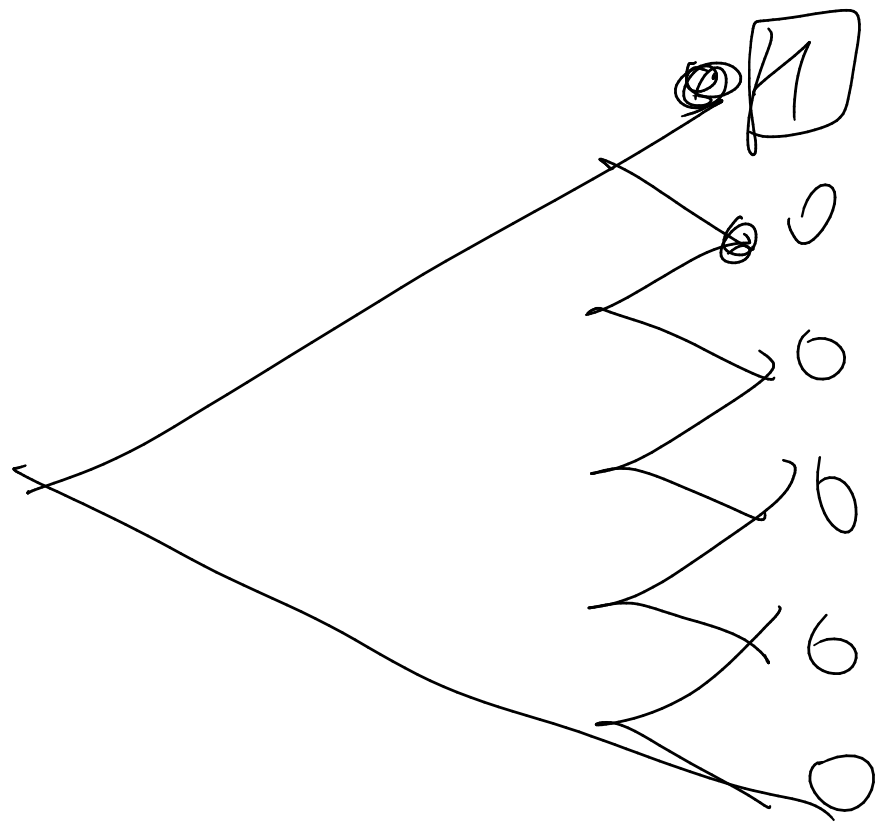


π_u

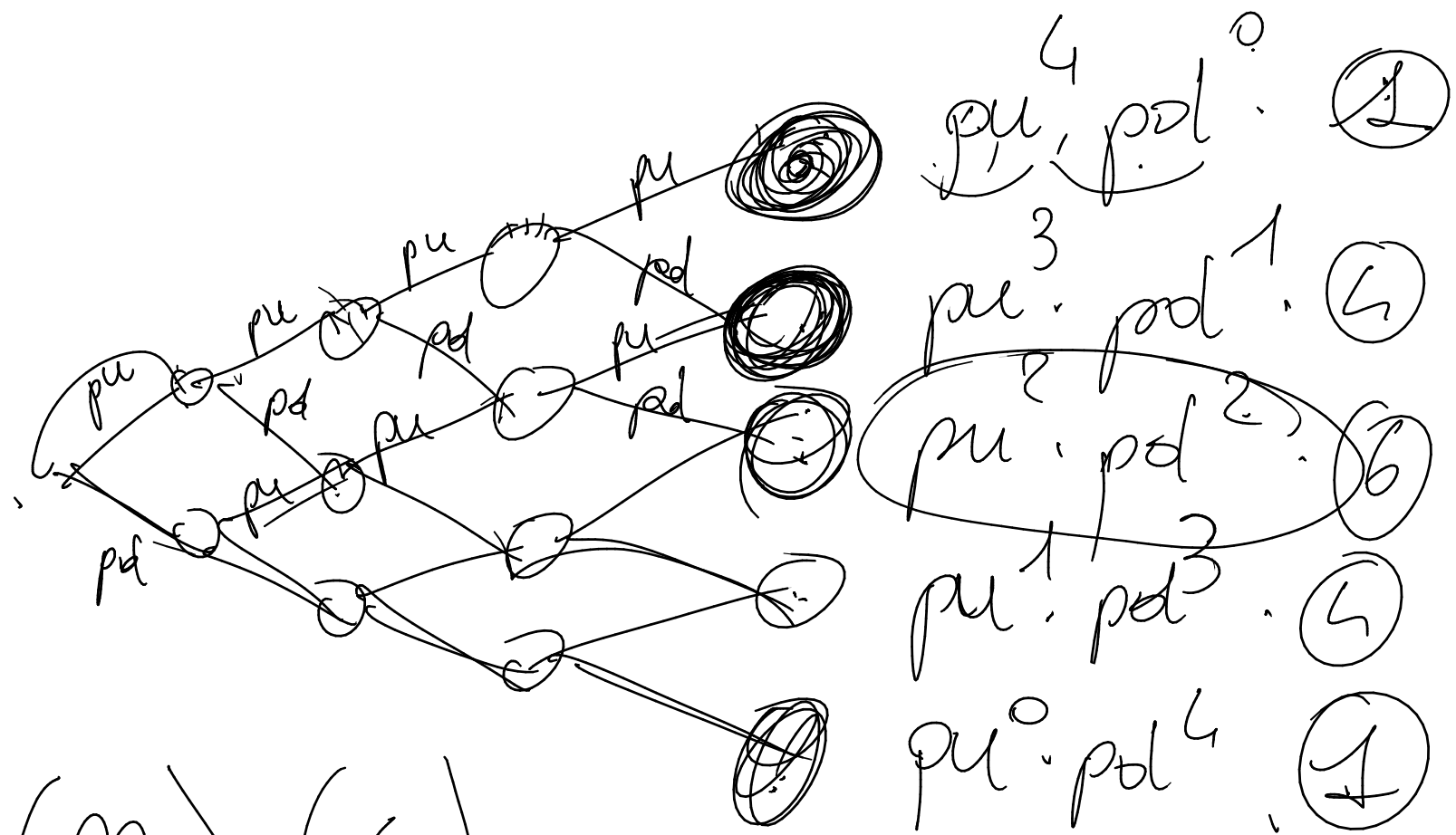
Payoff Coll =

$$\pi_u \cdot \text{payoff}(u^p) + \pi_d \cdot \text{payoff}(d^w)$$

π_d



1
1



$$\binom{m}{k} \binom{4}{4}$$

$$\frac{n!}{k! (n-k)!} = \binom{n}{k} \quad k \in \mathbb{N}^0 \text{ произв. чл}$$

$$\frac{4!}{4! \cdot 0!} = 1$$

$$\binom{4}{0} = \frac{4!}{0! \cdot 4!} = 1$$

$$\binom{4}{3} = \frac{4!}{3!(4-3)!} = \binom{4}{1}$$

$$\binom{4}{2} = \frac{4!}{2!2!} = \frac{\cancel{4} \times 3 \times 2}{2 \times \cancel{2}} = \binom{6}{2}$$

COMBINATIONS $(n; k)$

$$\text{Present Value} = \frac{1}{(1+r)^4}$$

$$p_u = \frac{(1+r) - d}{u - d}$$

$$p_d = 1 - p_u$$

$$\sum_{k=0}^m \binom{m}{k} p_u^k p_d^{m-k}$$

$$\left(\max \left[S u^k d^{m-k} - K, 0 \right] \right)$$

$$Q = \sum_{k=0}^m \binom{m}{k} \cdot \left[\pi_u^k \cdot (\pi_0)^{(m-k)} \right]$$

$$\max \left[S u^k d^{(m-k)} - K, 0 \right]$$

$$P + S = C + k e^{-rT}$$

$$P = C + k e^{-rT} - S$$

