

PENSION FUND

- The value at time t of the **accumulated investments in the pension fund**, given by

$$F_t = P \sum_{j=0}^{\lceil t \rceil - 1} \frac{S_t}{S_j}, \quad 0 < t \leq T,$$

depends not only on the current unit price but also on the unit prices at all past premium dates.



This **path-dependence** will increase remarkably the **computational complexity** of our valuation procedure. In fact all the variables involved have now to be represented in a binomial tree with **non-recombining** nodes.

To see this with an **over-simplified example**, assume that

$$T = 3, \quad u = 2, \quad d = 1, \quad S_0 = 1, \quad P = 1000.$$

The **stochastic evolution** of F_t from times 1 to 3 can be represented in the following binomial tree with non-recombining nodes. All the $2^T = 8$ paths that the unit price can follow from time 0 to time T need now to be considered, even if the different final values for it (between brackets) are only $T + 1 = 4$.

