

M339 W: September 3<sup>rd</sup>, 2021.

## Real Options.

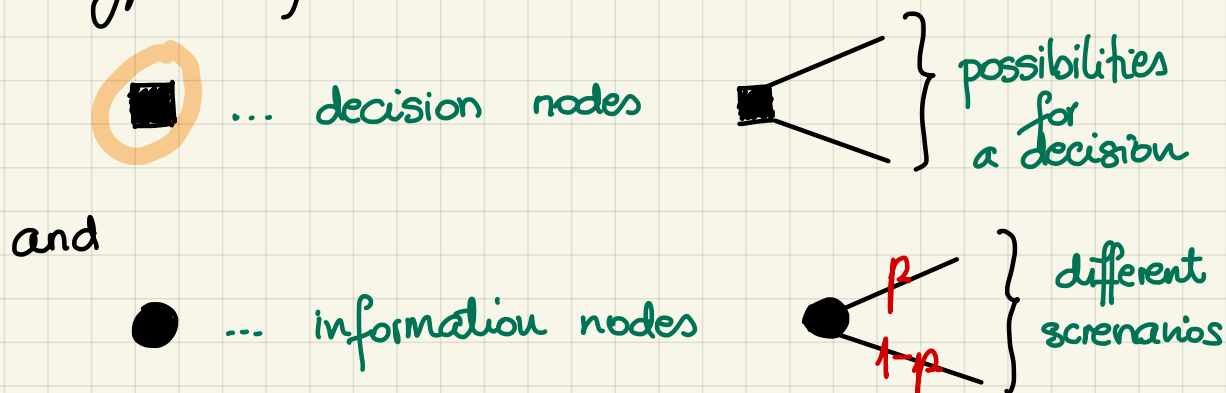
A **real option** is a right to make a business decision or to make an investment.

- Example.
- Jasper Fforde: options on whether members of a royal family marry a member of a different royal
  - option to make a movie out of a book
  - renewing a TV show for another season
  - parking lot downtown

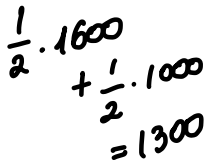
Real options are different from derivative securities (like calls and puts that we usually talk about) since they don't have a tradeable underlying asset (so there is no straightforward pricing by replication). Also, they are not usually traded themselves.

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To value real options we will use **binary trees** w/ two types of nodes:



- $$p = \frac{1}{2}$$



Calculate the value of the option at  $t = 0$ .

# pricing

- ← primary

## Subjective Probabilities.

Our agents form conclusions/models about what the relative likelihoods are of the price of a particular asset at a later date. Formally, they create a model for the distribution of the asset price @ time  $T$ , i.e., the random variable  $S(T)$ .

At least, they operate under their subjective beliefs about  $\mathbb{E}[S(T)]$ . For now, we focus on this simple case.