

E: Value of information (VOI) analysis

Uncertainty analysis application:

- Determining the value of information
Measure by willingness to pay (**WTP**) for it

Approach:

- Similar to previous analysis but use **X as the price** of information
- Solve for **maximum X** where it's worth buying information

Example:

Upgrading an emergency communications system

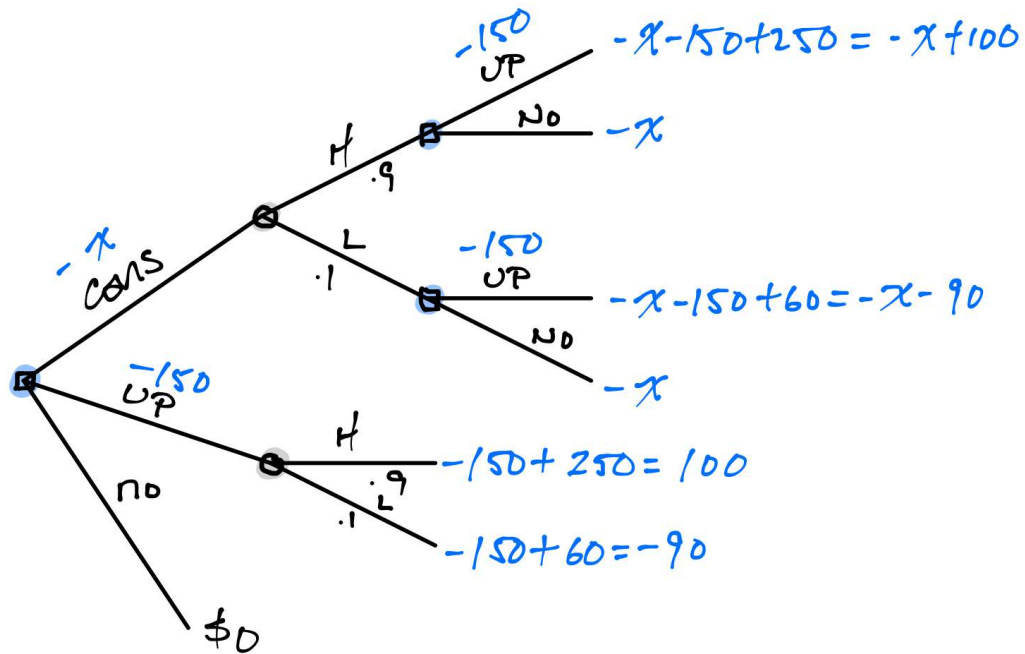
- Cost: \$150 M
- Benefits are uncertain:

State	Probability	Benefit
Works well, high payoff (H)	90%	\$250M
Works poorly, low payoff (L)	10%	\$60M

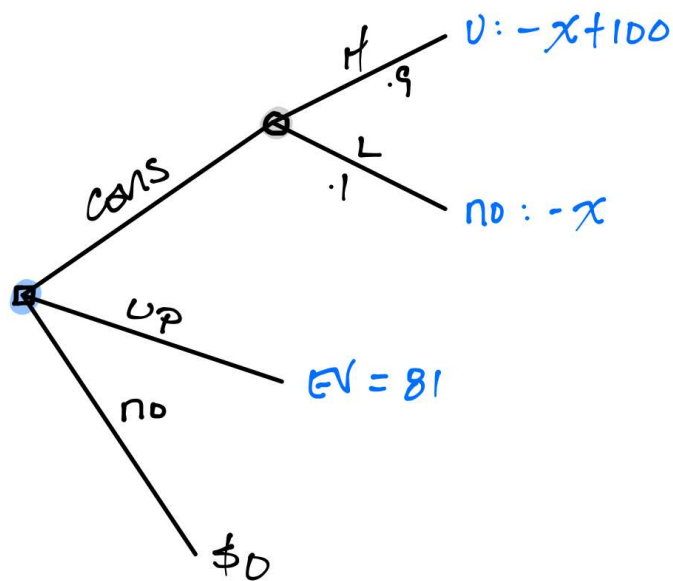
- Could hire consultant to determine state

Decision Tree:

Initial node: consultant, upgrade, or nothing

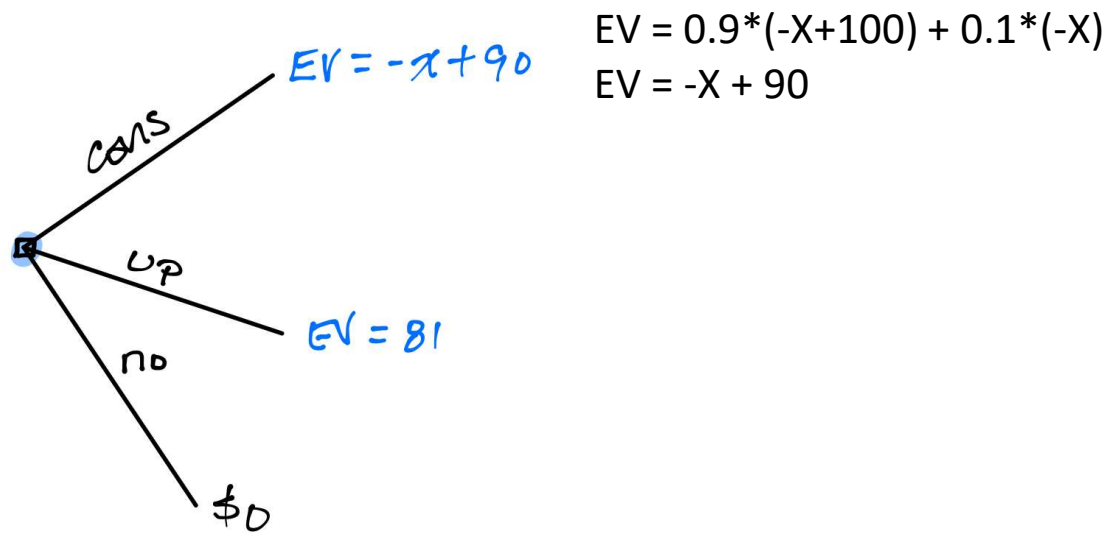


Simplifying the right nodes:



$$EV = 0.9 \cdot 100 + 0.1 \cdot (-90) = 81$$

Simplifying again:



Buy information when:

$$-X + 90M \geq 81M$$

$$X \leq 9M$$

Conclusion:

- Maximum WTP for information is \$9M

Exercise on GC