12.5 Strategy under uncertainty

Name: _____ Class: _____ Date: _____ **Total: 14 marks**

KEY WORDS EVPI • real option

Objective

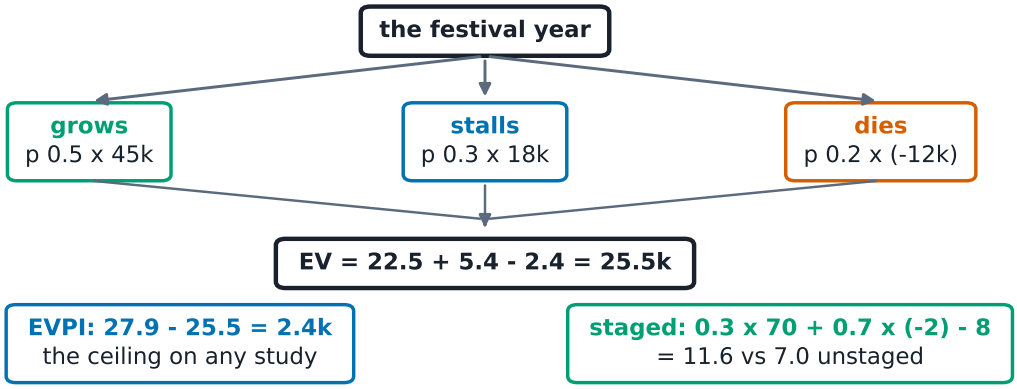
Compute expected values, price information at its EVPI, and value staging as a real option.

1 Key knowledge and worked examples

■ EV, EVPI, options

EV = the probability-weighted payoff. EVPI = EV with perfect information minus EV - the ceiling on any study. A real option pays to cut the tail; every option carries a trigger and an expiry.

Three futures, one expected value



The pilot is worth more than the forecast

■ Worked example. The bakery

EV 25.5; EVPI 27.9 - 25.5 = 2.4; staged $0.3 \times 70 + 0.7 \times (-2) - 8 = 11.6$ against 7.0 unstaged ✓.

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2 Practice

A product launch: boom 30k (p 0.4), steady 12k (p 0.35), flop -8k (p 0.25). A staged version: a 5k pilot that converts the flop into a -4k outcome and leaves the rest unchanged. The unstaged expansion alternative is 0.25 x 60k + 0.75 x (-16k).

2.1 The expected value of the launch. [2]

2.2 The EVPI. [3]

2.3 The staged launch: compute its EV and compare with the unstaged alternative of $0.25 \times 60 + 0.75 \times (-16)$. [4]

2.4 A research firm offers a market study for 4k. The verdict, in one sentence of arithmetic. [2]

2.5 Write a trigger for the staged launch. [3]

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Solutions

2.1

- $0.4 \times 30 + 0.35 \times 12 + 0.25 \times (-8) = 12 + 4.2 - 2 = 14.2$k.

2.2

- With perfect information act only on boom and steady: $12 + 4.2 = 16.2$k.
- EVPI $= 16.2 - 14.2 = 2.0$k.

2.3

- Staged: $12 + 4.2 + 0.25 \times (-4) - 5 = 10.2$k.
- Unstaged alternative: $15 - 12 = 3.0$k. Staging wins by 7.2 - the tail again.

2.4

- The study at 4k exceeds the 2.0k EVPI ceiling: unbuyable at any quality.

2.5

- Any pre-committed rule with a number and a date: e.g. pilot sign-ups below 60% of forecast by week 3 lapses the option.