Note 2: Making the Business Case for IT Investments

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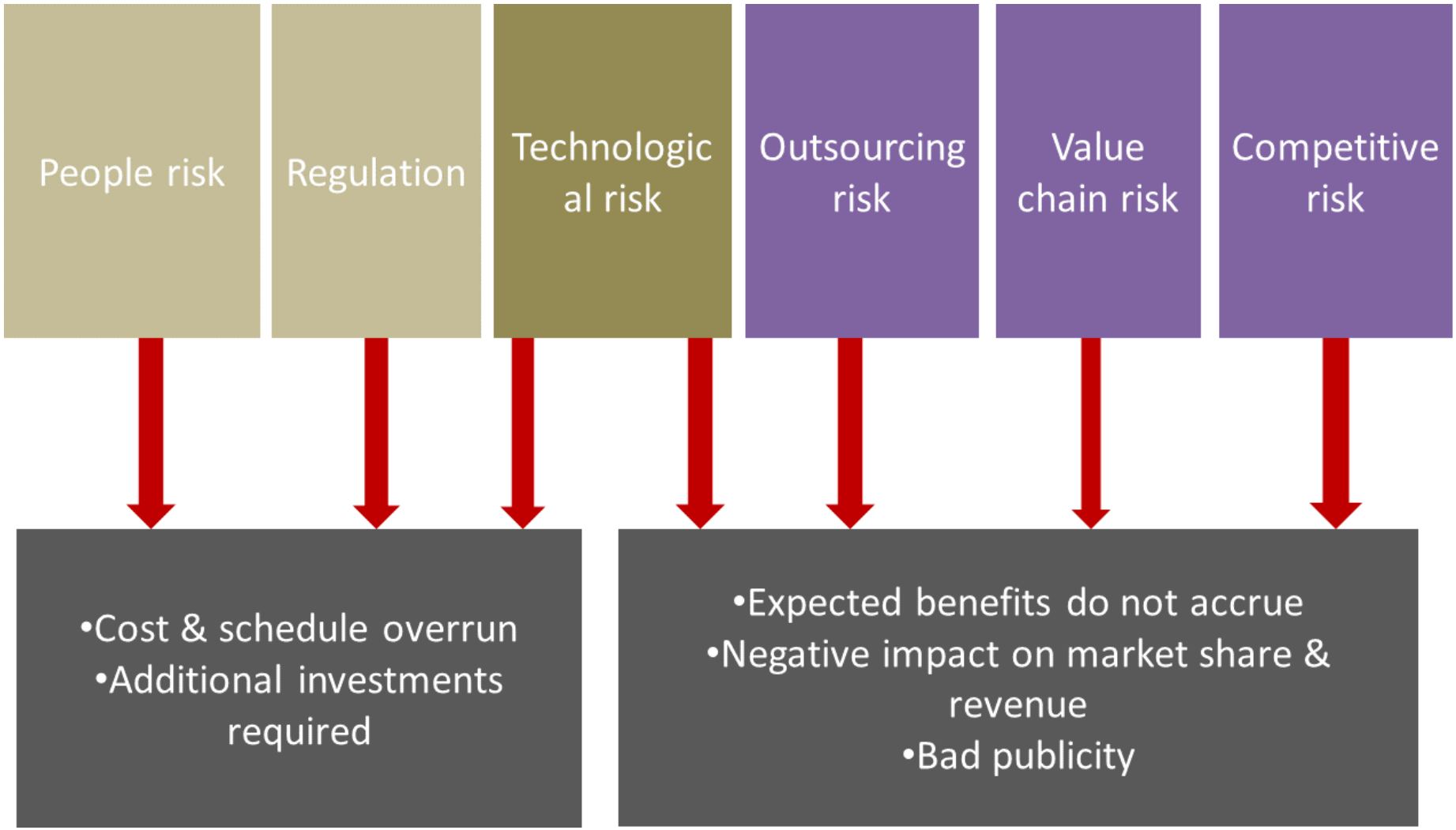
Agenda

Assessing risks on IT investments

- What are some of the risks that make it difficult in your experience to assess returns to IT investments?

IT investment risks and consequences



IT investment nightmares galore

- Cigna's customer data integration project
  - Cost over $1 billion
  - Resulted in loss of market share
- Nike's $440 million supply chain redesign
  - Experienced major decline in performance
  - Stock price temporarily declined by 20%
- Hershey's $125 million enterprise resource planning project
  - Big bang implementation
  - Rushed to meet deadline
  - Negative impact on order processing and fulfillment

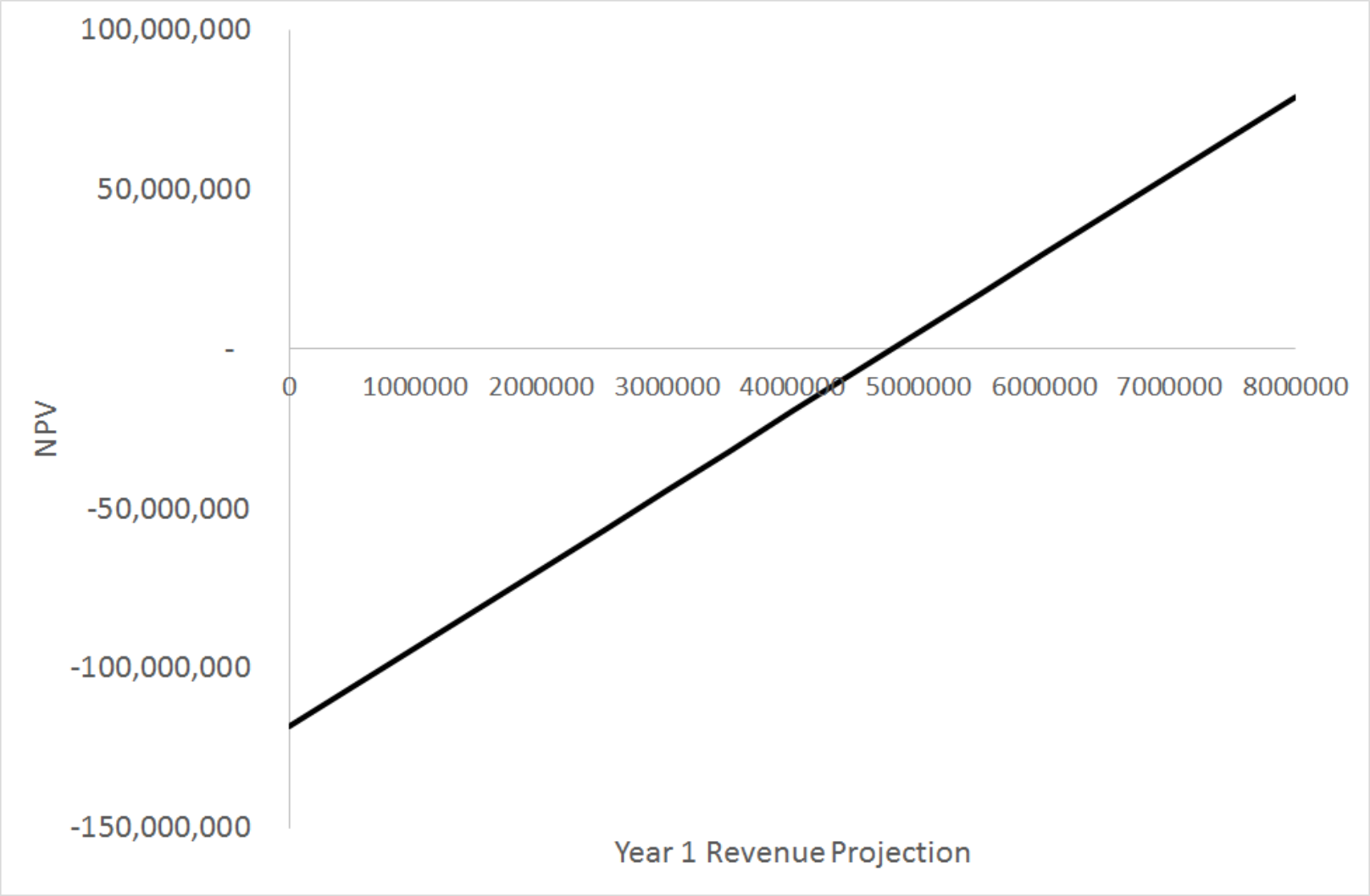
Investing in an Analytics Platform

- See handout *mini_case.pdf*
- Answers in *mini_case_solution.xlsx*
- NPV = ₹5,107,698 $>$ 0
- IRR = 25.80% $>$ 10%
- Both say that we should accept the project

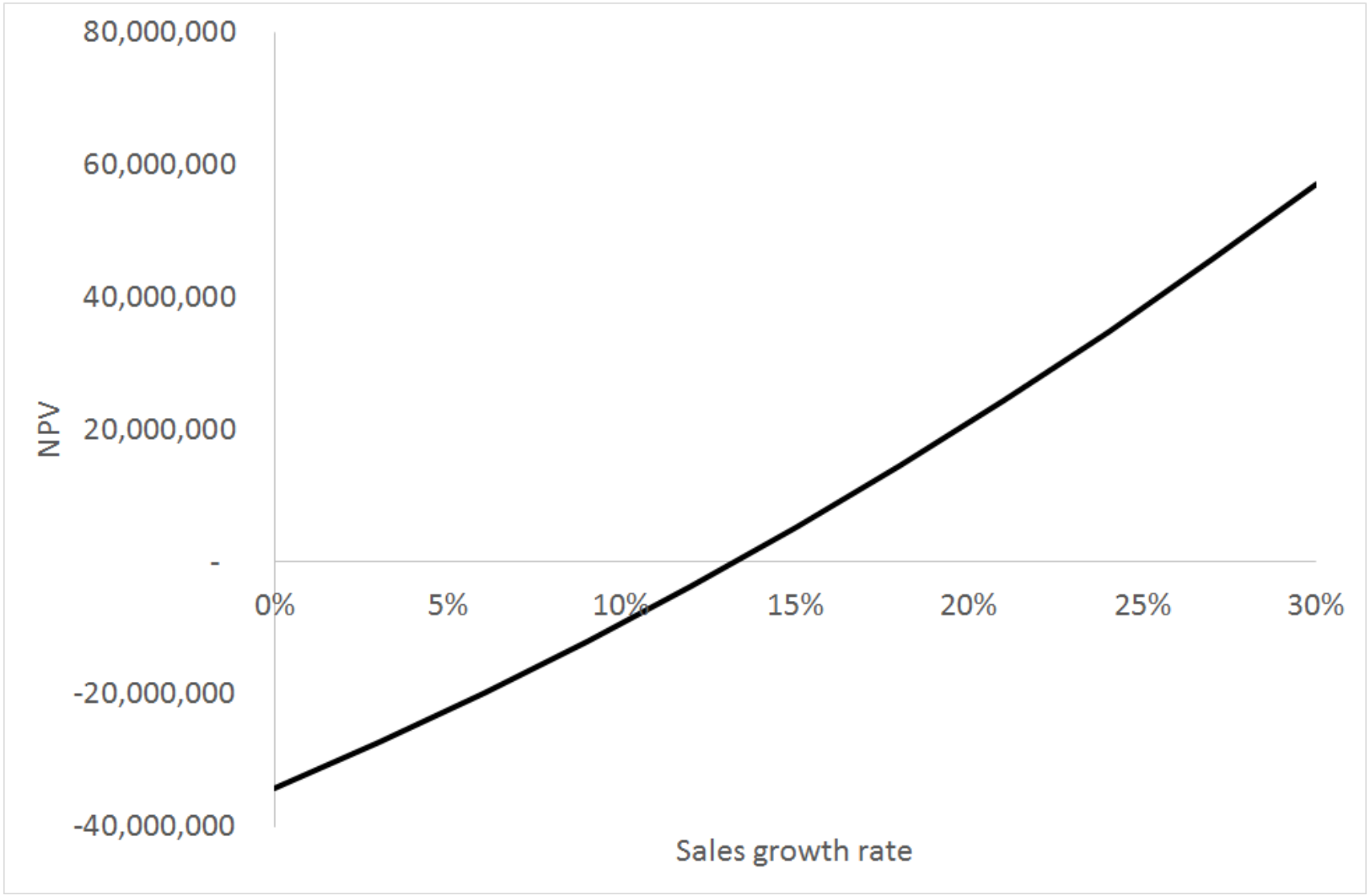
Benefits and costs

- For ease of understanding sensitivity analysis, let us put all cash flows into three categories (all in present value terms):
  1. Initial cost = 58 lakhs
  2. PV(Benefits) = 330 lakhs
  3. PV(Annual costs) = 222 lakhs
- NPV = 330 – 222 – 58 = 50 lakhs
- But is this good or bad? Depends on variance...
- If initial cost is 2x, then NPV = 330 – 222 – 2 × 58 = –8 lakhs (reject)
- If PV(Annual cost) is 1.25x, then NPV = 330 – 1.25 × 222 – 58 = –5.5 lakhs (reject)
- If PV(Benefits) is 0.85x, then NPV = 0.85 × 330 – 222 – 58 ≈ 0

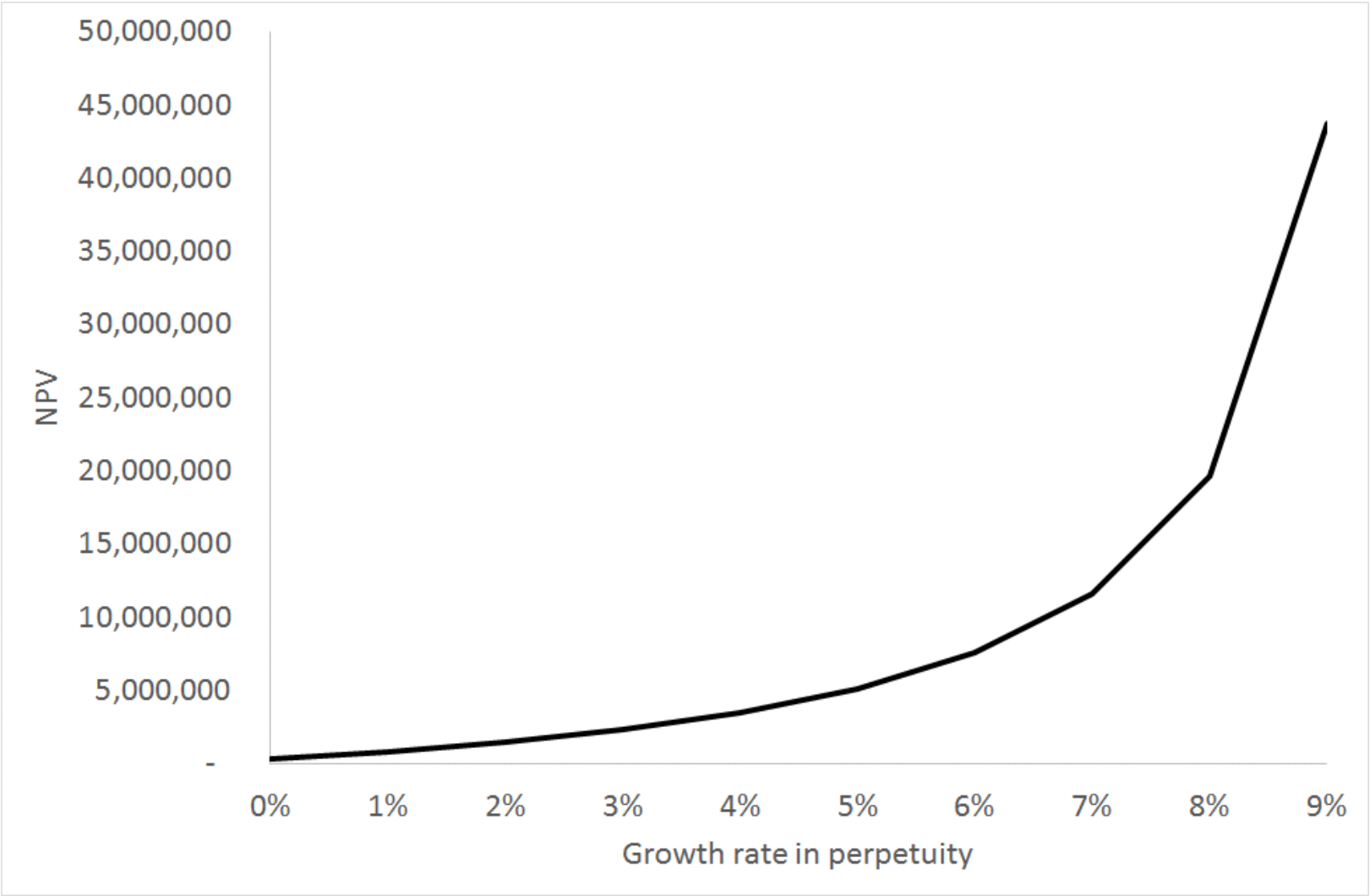
Sensitivity to Year 1 revenue



Sensitivity to revenue growth



Sensitivity to growth rate of perpetuity



Evaluating an IT investment

Sequence of steps

1. **Business Discovery:** Make judgments and/or assumptions about how the technology project will impact cost and revenue drivers to improve business performance
2. **Base Case:** Determine base case cash flows as if the firm will continue its operations without implementing the technology project
3. **Project Costs:** Determine costs associated with implementing the technology project. These costs involve both the initial investment and recurring maintenance costs
4. **Free Cash Flows with Project:** Determine free cash flows after the firm has implemented the technology project, based on assumptions for the business drivers and costs of the project

Evaluating an IT investment
Sequence of steps

5. **Incremental Cash Flows:** Determine the incremental cash flows by subtracting the base cash flows from the cash flows in Step 4. Calculate NPV, IRR, and payback period

6. **Sensitivity and Options Analysis:** Perform sensitivity analysis to incorporate varying assumptions and scenarios to understand the range of possible outcomes.

Real options

NPV treats each investment as a **now or never** decisions. But investments are flexible. For instance, you can scale up or scale down based on new information.

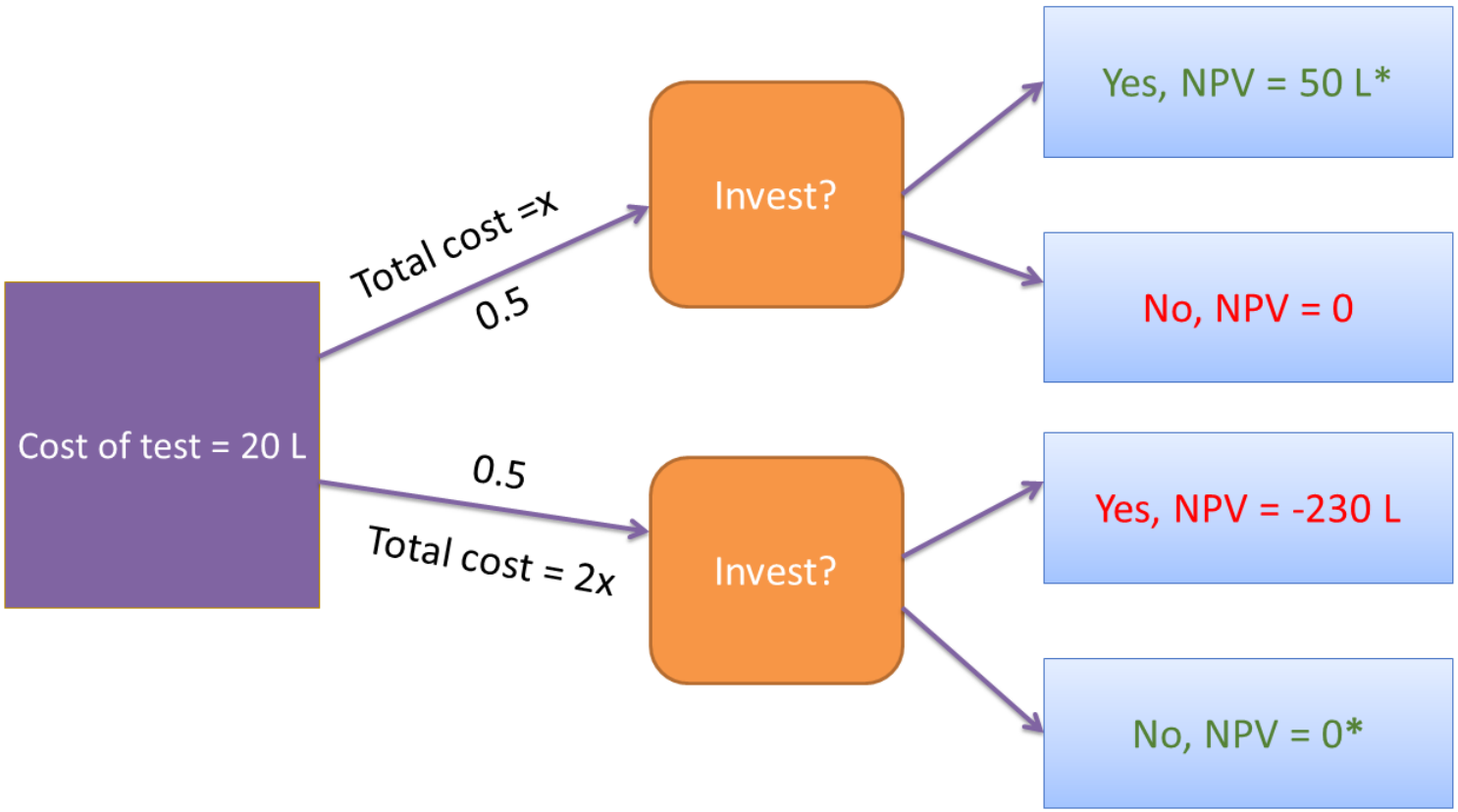
- **"Now or never"** does not consider additional choices to structure the investment favorably
- Risk/uncertainty associated with large IT investments
- Does not consider options, which are choices to take some actions in the future based upon certain outcomes
- Real Options Analysis - Firm has the right but not the obligation to acquire IT assets
  - Active NPV = Passive NPV + Value of managerial flexibility (value of real option)

An option's view of the Analytics platform investment

- What if one of the risky elements in this project, the life-cycle cost (i.e., initial + annual costs), doubled?
- PV of benefits = ₹330 lakhs
- PV of costs = ₹280 lakhs
- Suppose there is a 50% chance of the costs being double, that is, ₹560 lakhs
- "Passive" NPV = $330 - 0.5 \times 280 + 0.5 \times 560 = -90$ lakhs $\Leftarrow$ Reject the project

"Test"

- Let's say that a test or a pilot helps determine if the cost will be x or 2x
- The cost of this test phase is ₹20 lakhs



Active NPV

- Active NPV $=$ – 20 lakhs $+ 0.5 \times 50$ lakhs $+ 0.5 \times 0 =$ ₹5 lakhs $\Rightarrow$ once we consider the test phase, we accept the project, that is,
  - We decide to run the test today
  - If the test reveals that cost will be ₹280 lakhs, then we will go ahead with the entire project
  - If the test reveals that the cost will be ₹560 lakhs, then we will reject the entire project
- Being able to avoid the negative NPV when the cost is found to be high helps make the project NPV positive

Value of the flexibility

- Value of flexibility = Active NPV – Passive NPV = 5 lakhs - (-90 lakhs) = ₹95 lakhs
- Since these flexibilities help avoid negative outcomes, their value is never negative
- IMPORTANT: This flexibility is worthless if it DOES NOT resolve uncertainty
  - In our example, the test helps resolve the uncertainty as to whether the cost will be low (₹280 lakhs) or high (₹560 lakhs)

Managing vs reducing risk

- The options approach helps manage risk
- Has been used successfully to justify investments in
  - New IT applications (e.g., RFID)
  - Large upgrades with insufficient immediate benefits
  - Infrastructure expansion
  - Large implementations with high people & tech risk
- But options do not change the likelihood of unfavorable contingencies
- Need to actually reduce major risk factors