# Decision trees

- A decision tree can be a useful way to analyse decision making under uncertainty
- However, can get very complex!

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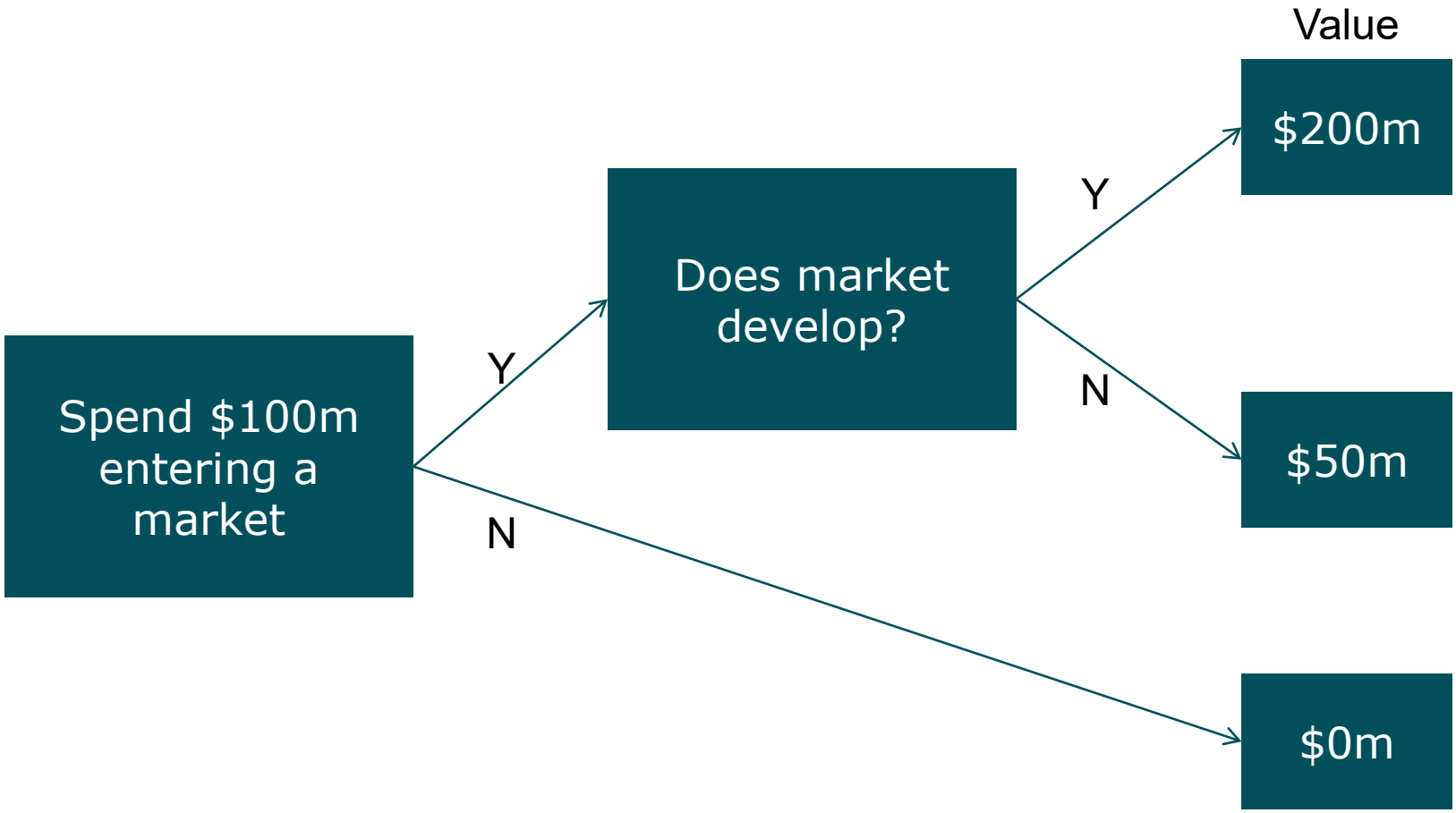
# A simple decision tree




See http://www.mindtools.com/dectree.html for a more complex example

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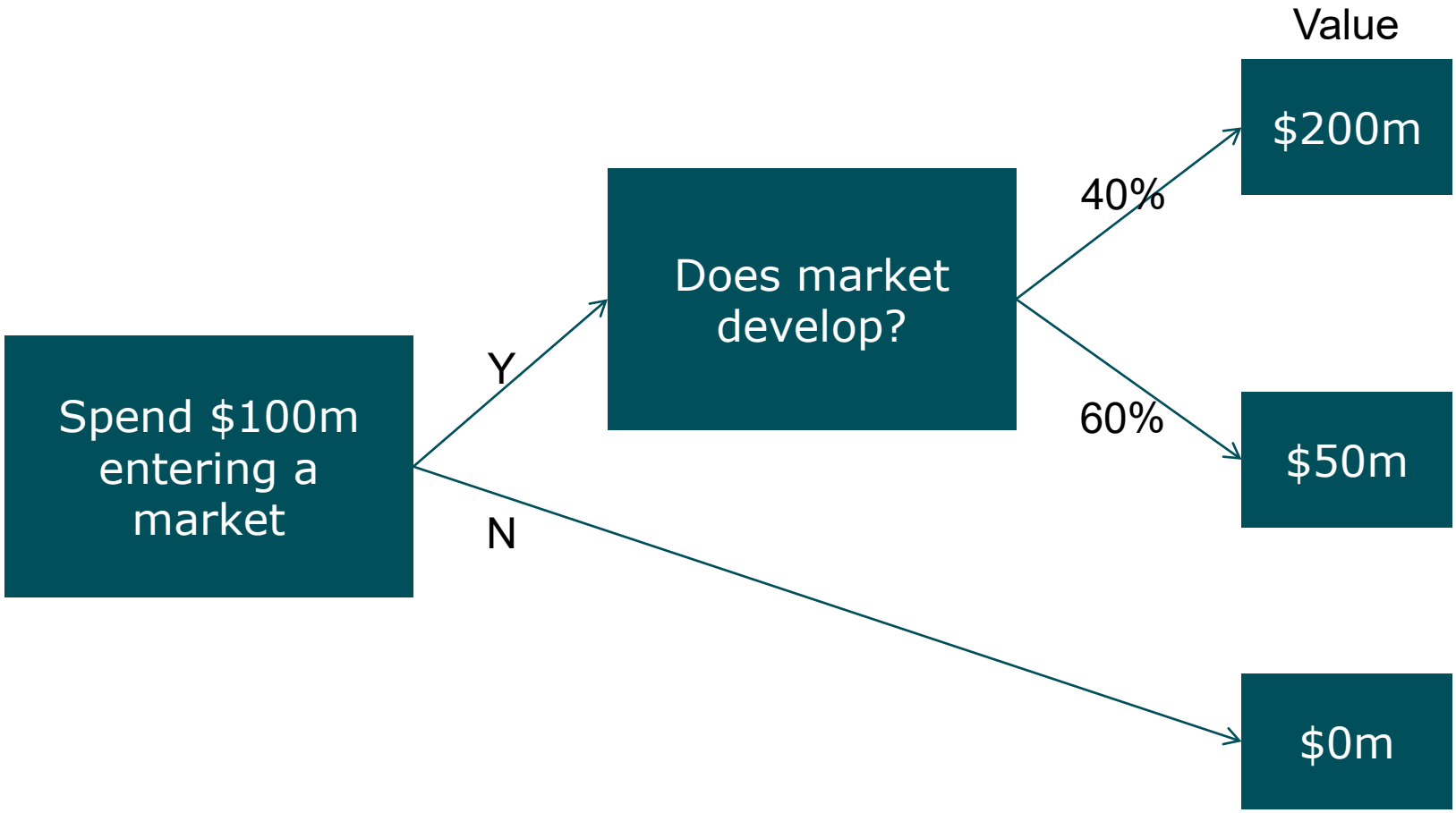
# A simple decision tree with probabilities added




Expected value of entering is -100+(0.4*200+0.6*50) = +$10millioin

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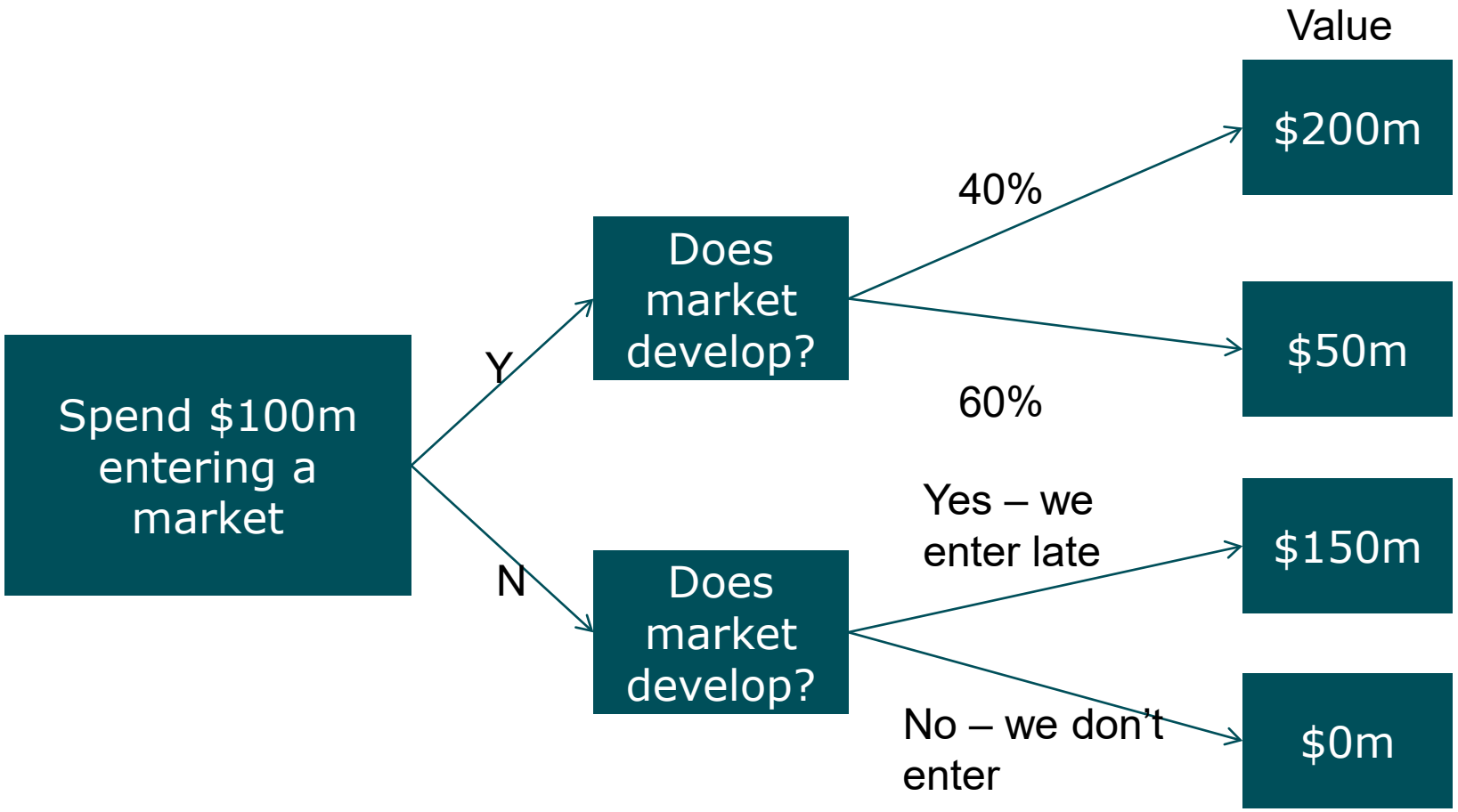
# But it can get more complicated!




Expected value of entering now is -100+(0.4*200+0.6*50) = +$10million
Expected value of waiting is .4*(-100+150) = +20million

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# Can get more complex

- Extra things one could model
  - Time value of money
  - Uncertainty about competitor actions
  - Multi-stage investments
  - Etc…
- At some point, decision trees become too complex
  - Wargaming or role playing can be an alternative approach – although less quantitative
  - Game theory is available – but only if you have a PhD in the topic!

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