

# HOW STOCHASTIC COST ESTIMATES COULD BE APPLIED IN RELATION TO TARGET VALUE DESIGN

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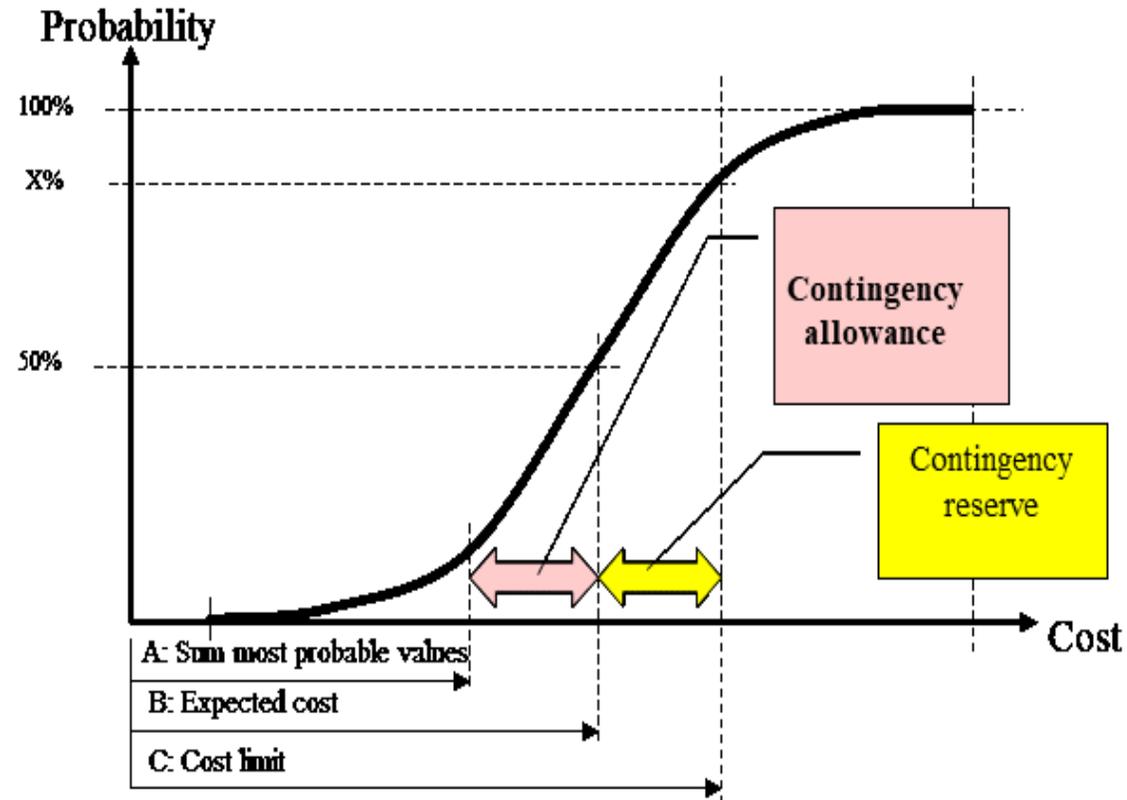
# Introduction

- The purpose of this paper is to discuss how to apply stochastic estimates in TVD. To achieve the purpose of the paper, we address the following research questions:
  - 1. How are cost targets set in TVD?
  - 2. How are cost targets set with stochastic cost estimates?
  - 3. How can stochastic cost estimates contribute to TVD?

## How cost targets are set in TVD

- Allowable Cost (AC) is cost the customer finds acceptable; i.e., they are willing and able to pay that amount and are assured that they will receive in return what they want. The project business plan should specify Allowable Cost.
- Market Cost is output from the cost model and estimated by the project team.
- The project team defines the Expected Cost. It would be the cost if the facility with determined performance were provided at current best practice.

# Stochastic Estimates



# Research methodology

1. Litterature review about setting targets in TVD.

- how cost targets are set in TVD

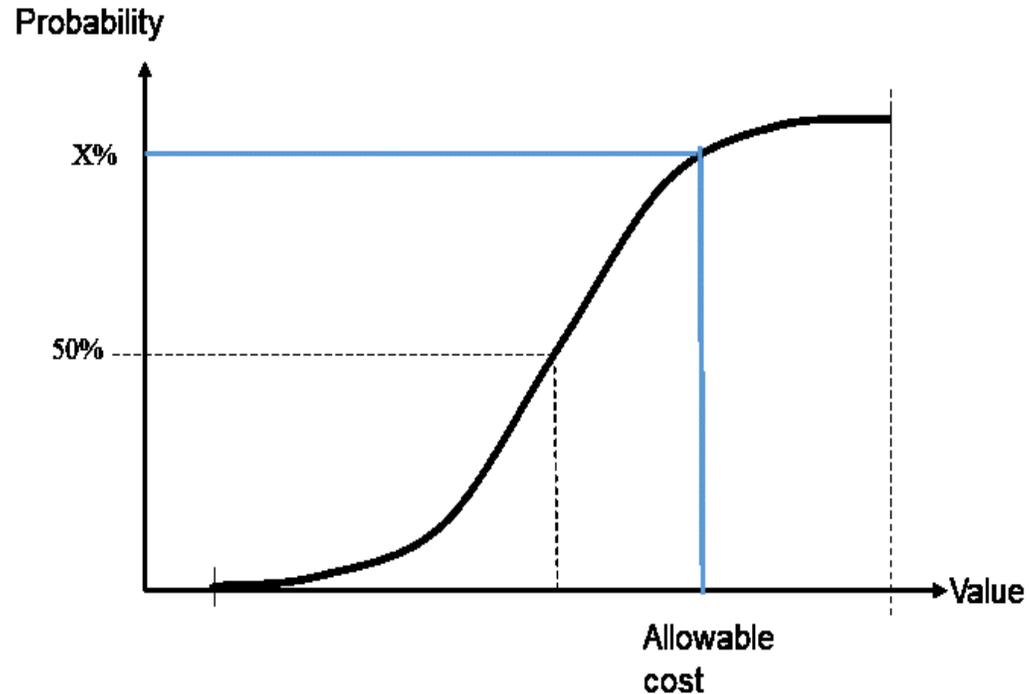
2. Case study of two Norwegian public Agencies (Statsbygg and Norwegian Public Roads Administration)

- how cost targets are set with stochastic cost estimates

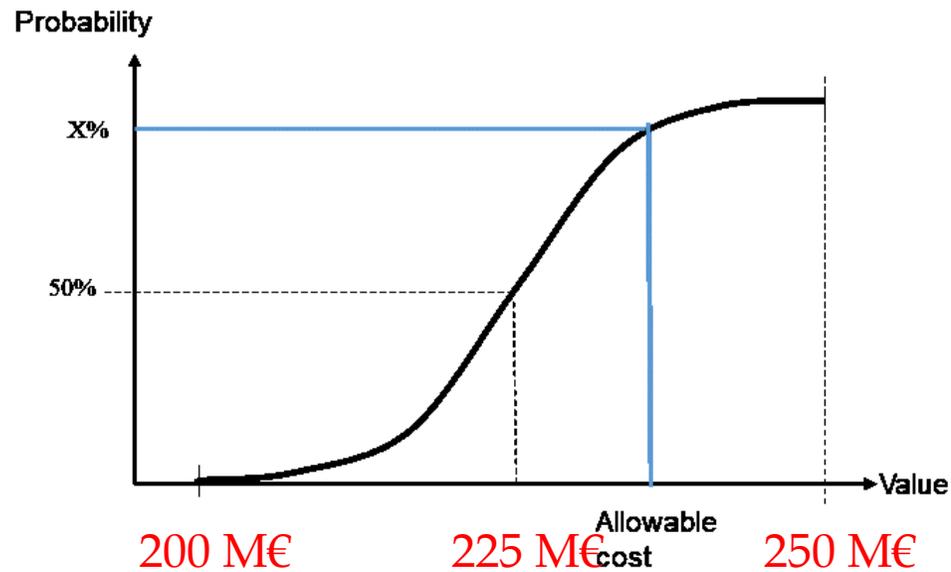
3. Analysis and comparison of 1 and 2

- how stochastic estimates can contribute to TVD

# Setting Allowable Cost (AC) based on a stochastic estimate of Value



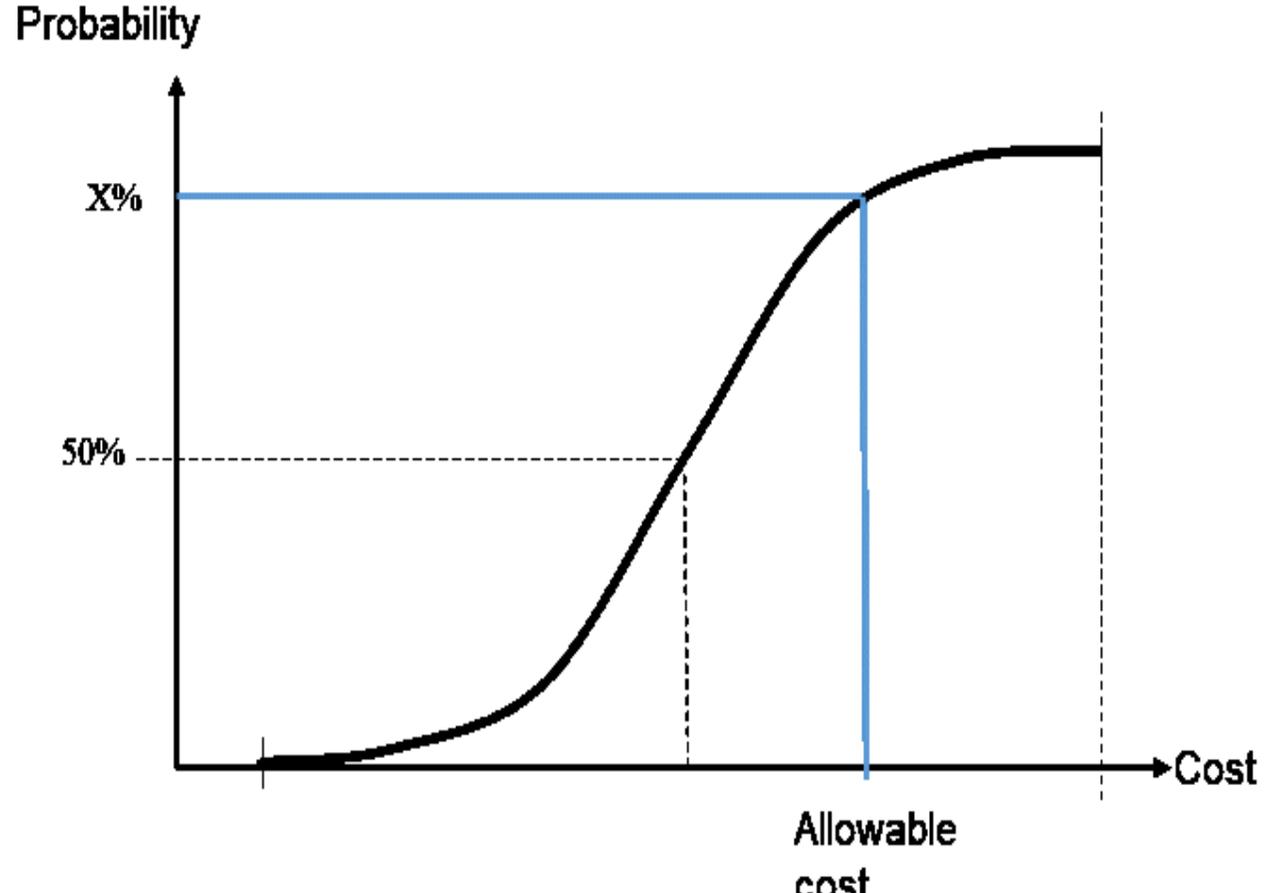
# Setting Allowable Cost (AC) based on a stochastic estimate of Value



- If you set AC at a X % probability level, it is X % probability of Value being lower than AC.
- If you set AC at 25 % probability, it is 75 % probability of Value being higher than AC.

# Estimating Market Cost (MC) as a stochastic estimate

- According to Pennanen and Ballard (2008) you should check if Expected Cost is higher than Allowable Cost, and if so, you should modify specifications.
- A suggestion would be instead of using Expected Cost, using P85, check if P85 is higher than Allowable Cost. If so, modify specifications.
- When Allowable Cost is higher than P85, define Target Cost below Expected Cost.
- Steer towards targets!



# A framework for applying stochastic estimates in TVD based on Pennanen and Ballard (2008)

ID	Step	Implication of Stochastic Estimates
1	Assess the business case.	Business case could include stochastic estimate of Value
2	Determine stakeholder values and define specifications of the project	Stakeholder values could be numbered by stochastic estimates
3	Determine the allowable cost	Allowable Cost could be determined based on a probability distribution of the total value of the asset
4	Determine the expected cost	Expected cost will be output of the stochastic estimate of Market Cost. Expected Cost will be the 50 % quantile, given a normal distribution of the stochastic estimate
5	If expected cost is bigger than the allowable cost then modify the specifications	When using probability distribution to represent Market Cost, Expected Cost would be the 50 % quantile. When comparing with Allowable Cost, you could consider a higher quantile, like 85 % quantile
6	Go to Step 3	
7	When expected cost is equal to or less than the allowable cost, start project delivery by setting target cost equal to or below expected cost	Target Cost below Expected Cost will give less probability than 50 % to reach target, but will at the same time drive innovation beyond current best practice
8	Launch design phase	When estimating Market Cost for design solutions, stochastic estimates could be applied
9	Decompose product level target cost to component level target cost	The component level target cost should be defined on the chosen probability level

Thank you for the attention!

- Questions or comments?