DSC5211C QUANTITATIVE RISK MANAGEMENT

SESSION 12 - Workshop

Fernando Oliveira
bizfmdo@nus.edu.sg

Project Management

Objectives

- To analyse how the PERT model can be extended to include CV@R.

- Explore some more features of GAMS:
    - Pert-Beta distribution in GAMS.
    - Solving system of non-linear equations.
    - Inclusion of several models in the same code.

Exercise 1. NUS Football Tournament

The NUS Student Association is planning to organize a football tournament in which the teams represent the different classes at NUS in the academic year 2017/18.

The following information has been collected for each activity in the project:

Activity	Pred.	Optimistic (a)	Most likely (m)	Pessimistic (b)
A – Choose Teams	--	2	5	7
B – Distribute invitations	A	5	7	11
C – Arrange Facilities	--	10	12	18
D – Promotions	B, C	4	5	8
E – Design and print Tickets	B, C	7	12	15
F – Tickets sale	E	10	15	21
G – Finalize Arrangements	C	1	3	5
H –Schedule the matches	G	1	5	6
I – Training	D, H	1	2	3
J – Tournament Days	F, I	2	3	4

- The duration of the activities is measured in Days.

A) Construct an activity-on-node diagram.

B) Compute the critical path. What is the project time?

C) Perform a risk analysis and compare it with the result reported in B).

Exercise 2. Gas Pipeline

A firm is renovating part of a gas pipeline in Turkey which was damaged by a terrorist attack.

You were asked to:

A) Construct an activity-on-node diagram.
B) Compute the critical path.
C) Compute the CV@R for the number of days the project may take to complete with a significance level of 10%, 5% and 1%.

- The duration of the activities is measured in Days.

The project activities are as follows:

Activity	Pred.	(*a*)	(*m*)	(*b*)
A – Choose the Team	--	7	12	15
B – Assemble a list of materials	A	1	3	5
C – Install Scaffolding	B	2	5	7
D – Procure Pipe and Valves	B	25	40	50
E – Deactivate & remove old line	B	5	7	10
F – Prefabricate new line	D	6	8	15
G – Place Valves	C, D, E	1	2	3
H – Place New Pipe	E, F	8	10	15
I –Connect Valves	G, H	2	4	5
J – Insulate	G, I	4	6	7
K – Pressure Test	I	2	3	5
L – Remove Scaffolding	I,J	1	2	3
M – Clean up	K, L	1	2	3

Summary

- We have solved two activity scheduling problems and compared the results using CPM, PERT and CV@R.

- We have introduced the computation of the Pert-Beta distribution in GAMS.

The End