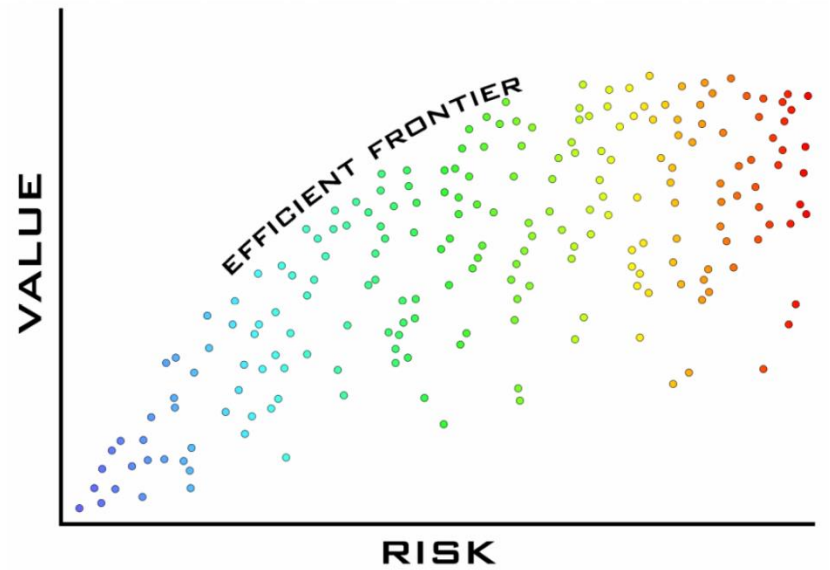
Problem Portfolio

TMKT48 Design Optimization

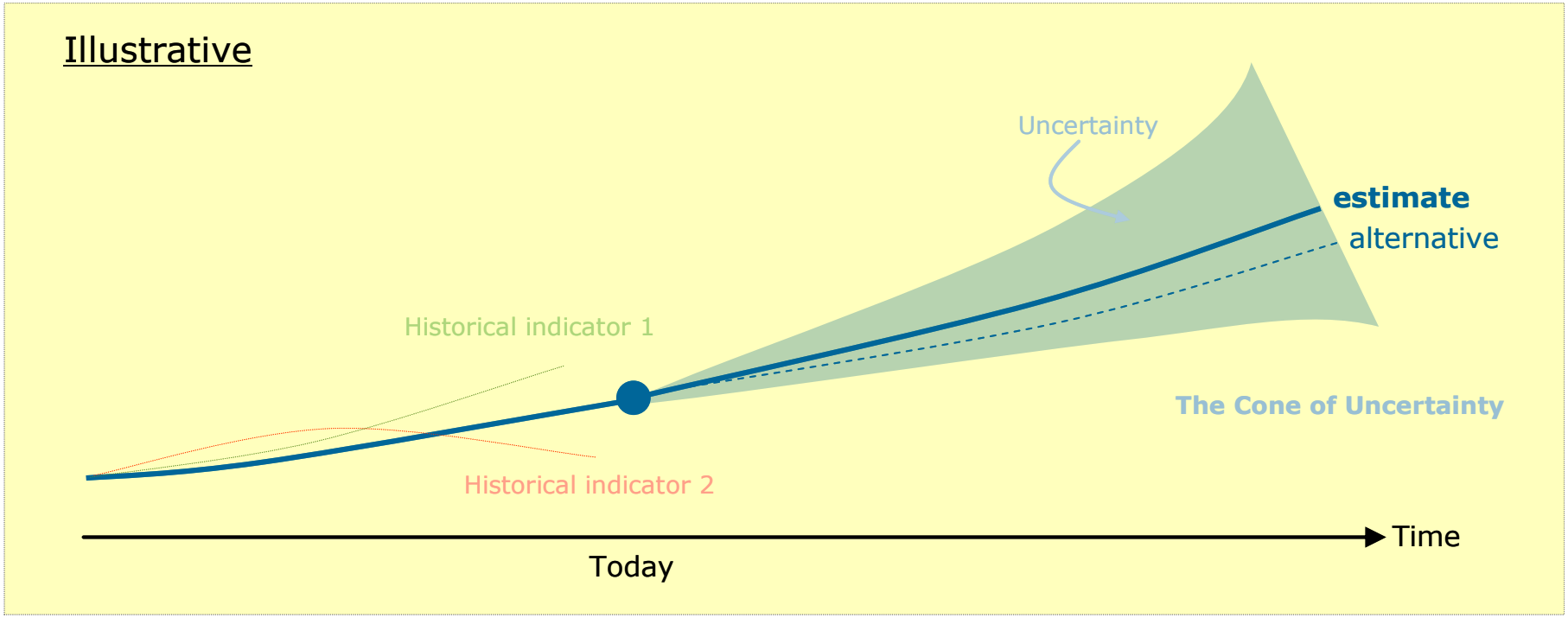
LINKÖPING UNIVERSITY

Product and Project Portfolios

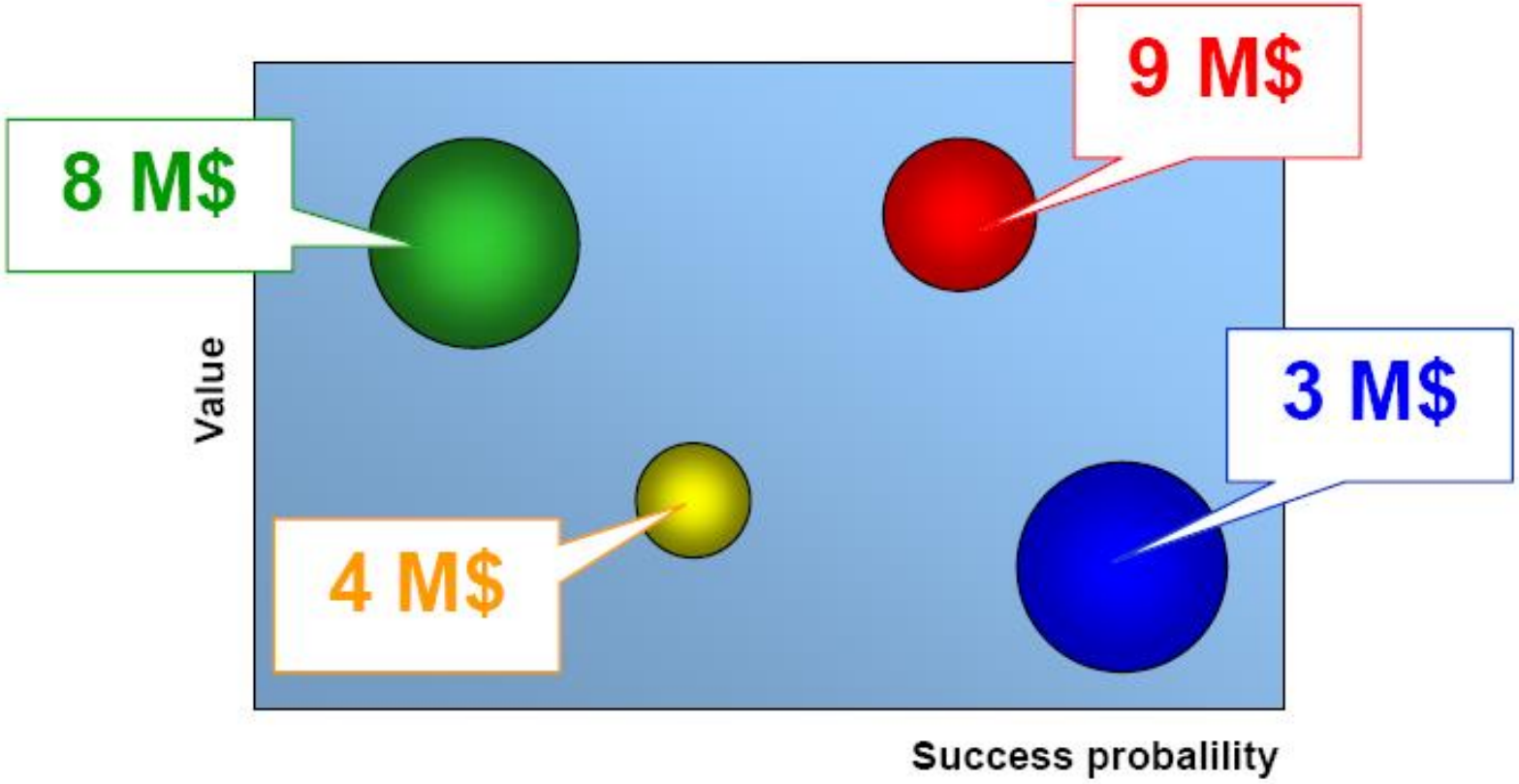
- New projects: Value vs Risque



The Cone of Uncertainty



Selecting the Correct Projects



Valuating Future Profit

Which has the highest value?

100kr today or 100kr tomorrow?

Net Present Value (NPV)
The value of future money, discounted to today

$$\mathrm{NPV(B)} = \sum_{i=1}^{n} \frac{B_i}{(1+r)^i}$$

B_i = a sequence of benefits

r = interest rate

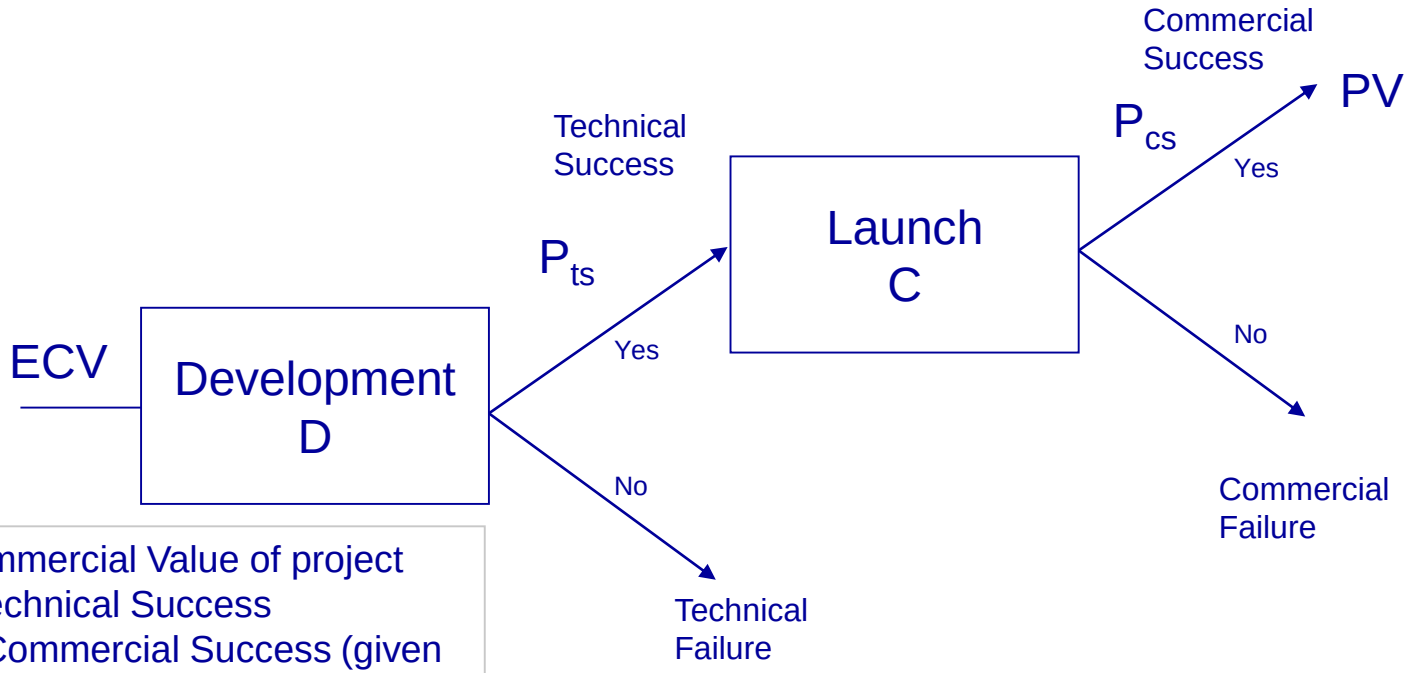
PV Example

- Assume interest rate 5%
- A benefit of 100kr in one year would then have the value:

$$PV = \frac{100}{(1+5\%)} = 95.24$$

- This means, 100kr in one year, has only a value of 95.24 kr today.
- What if we also have uncertainty?

Expected Commercial Value, ECV



ECV=Expected Commercial Value of project
P_{ts}=Probability of Technical Success
P_{cs} =Probability of Commercial Success (given technical success)
D=Development Costs Remaining in Project
C=Commercialization (Launch) Costs
PV=Present Value of projects future earning (discounted to today)

$$ECV = \left[(PV \cdot P_{cs} - C) \cdot P_{ts}\right] - D$$

Demonstration Example

Microsoft Excel - Bjojo Project selection.xls

File Edit View Insert Format Tools Data Window Help Adobe PDF

E11 =E10-E9

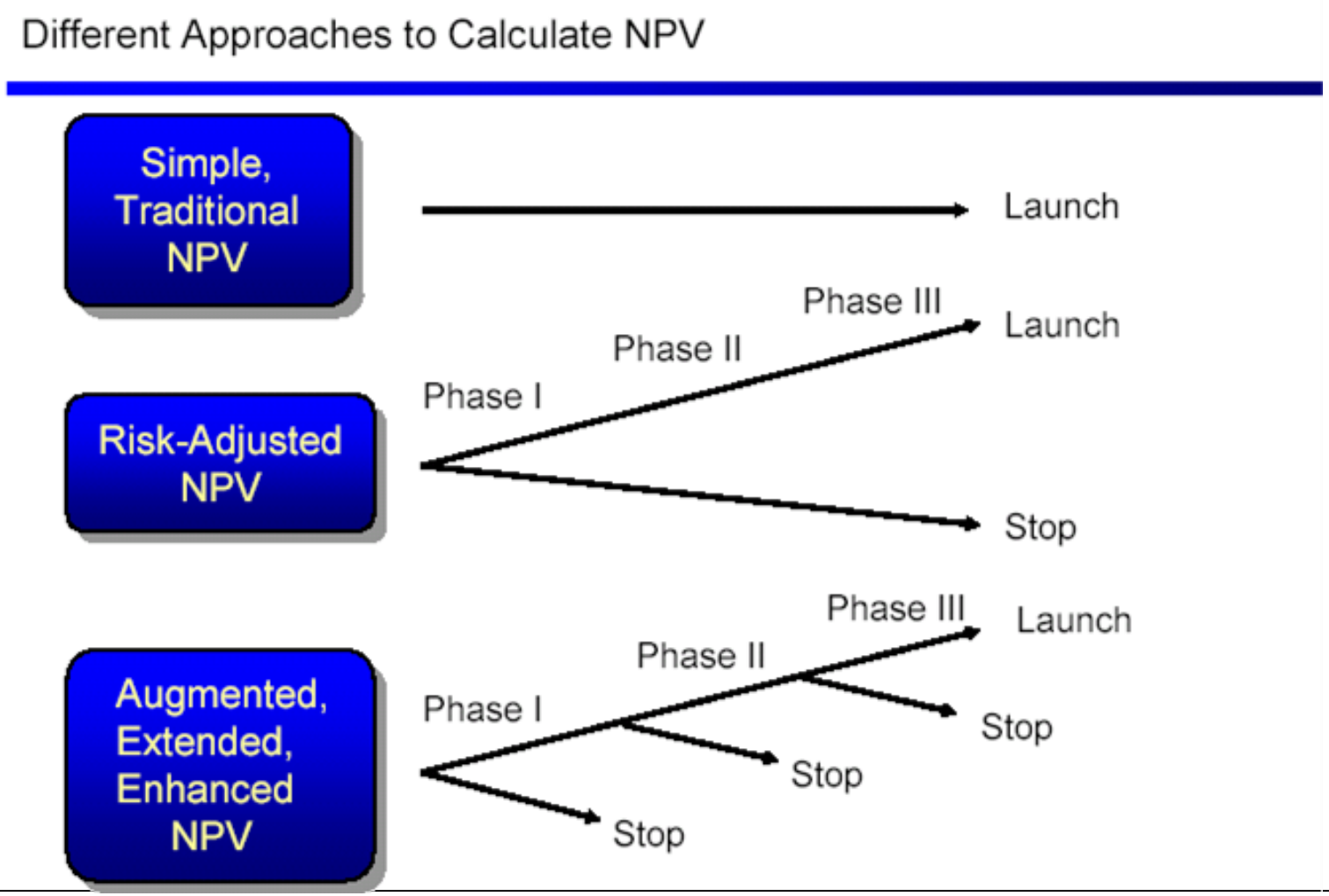
	A	B	C	D	E	F	G	H	I
1	Project name	PV	Probability of technical success (Pts)	Probability of commercial success (Pts)	Development cost (D)	Commercial-ization cost (C)	ECV	Decision	
2	Alpha	30,0	70%	50%	3,0	5,0	4,0	1	
3	Beta	63,8	50%	80%	5,0	2,0	19,5	1	
4	Gamma	8,6	75%	75%	2,0	1,0	2,1	1	
5	Delta	3,0	100%	100%	1,0	0,5	1,5	1	
6	Echo	50,0	60%	75%	5,0	3,0	15,7	1	
7	Foxtrot	66,3	50%	60%	8,0	7,0	8,4	1	
8					24,0	18,5	51,2		
9				Total Cost	42,5				
10				Budget	34,0				
11				Surplus	-8,5				

Sheet1 Sheet2 Sheet3

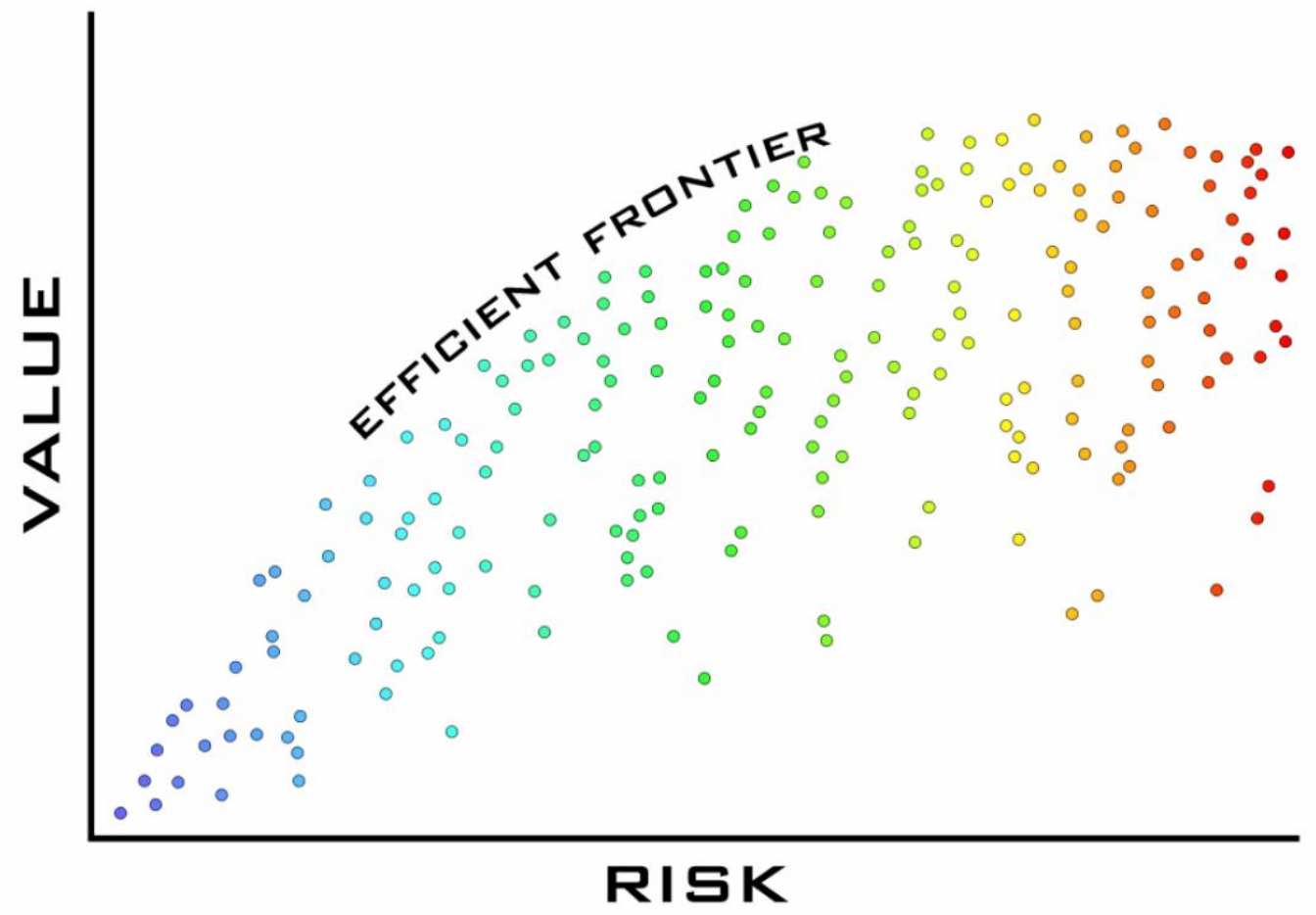
Ready NUM

$$ECV = [(PV \cdot P_{cs} - C) \cdot P_{ts}] - D$$

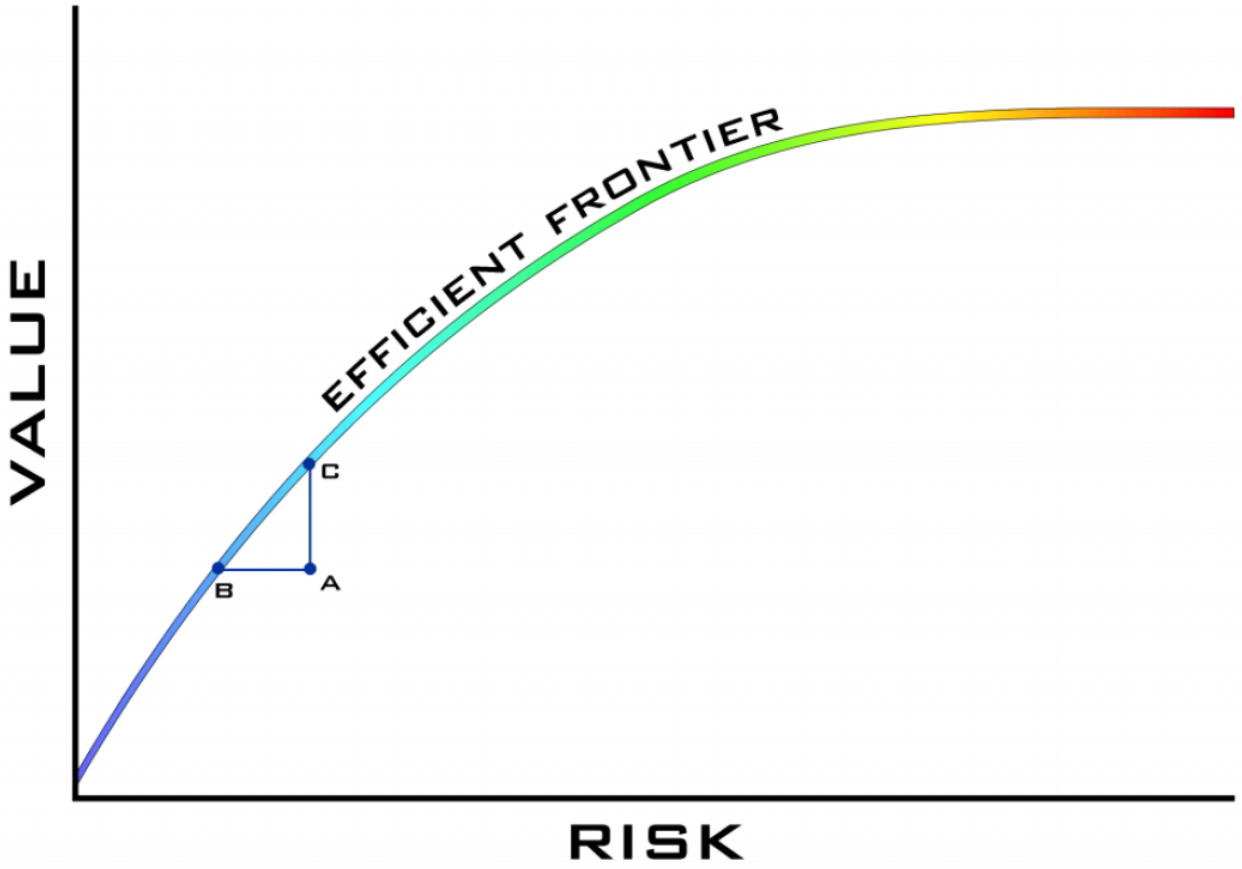
From simple to a more realistic valuation



Optimal portfolios



Optimal portfolios



Questions?