Should you create project level alternatives in portfolios?

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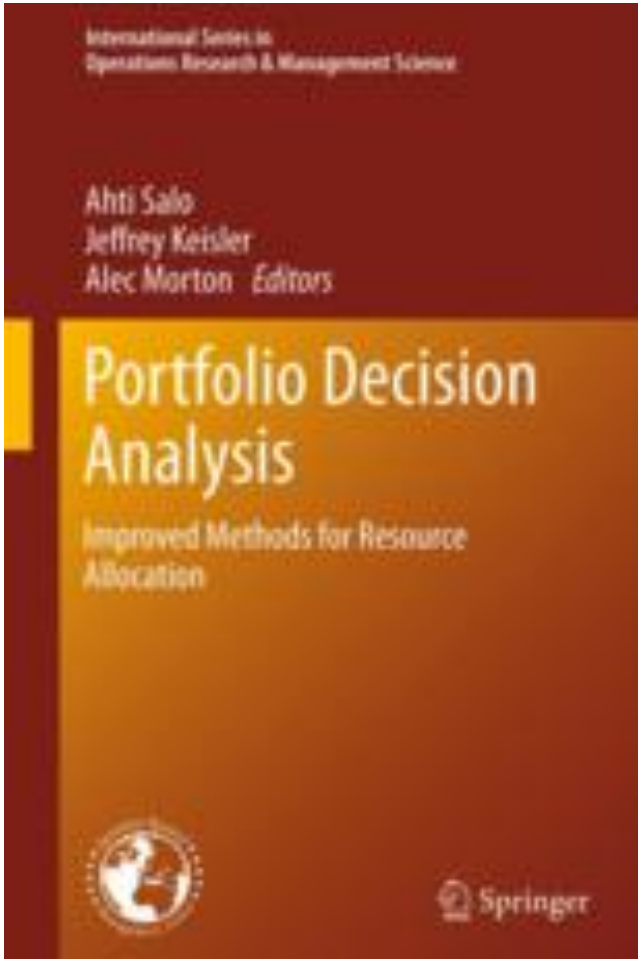
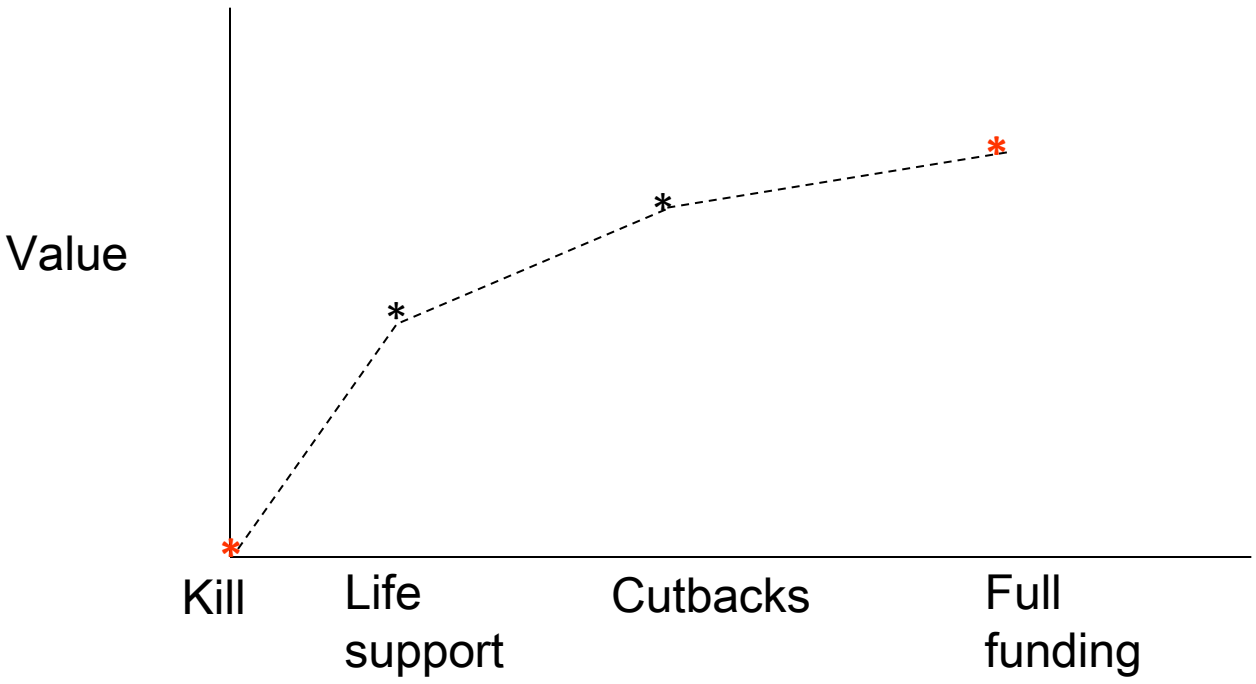
Ideas

- Portfolio decision quality
- Calculating value added
- Using data

Of potential interest
www.portfoliodecisionanalysis.com

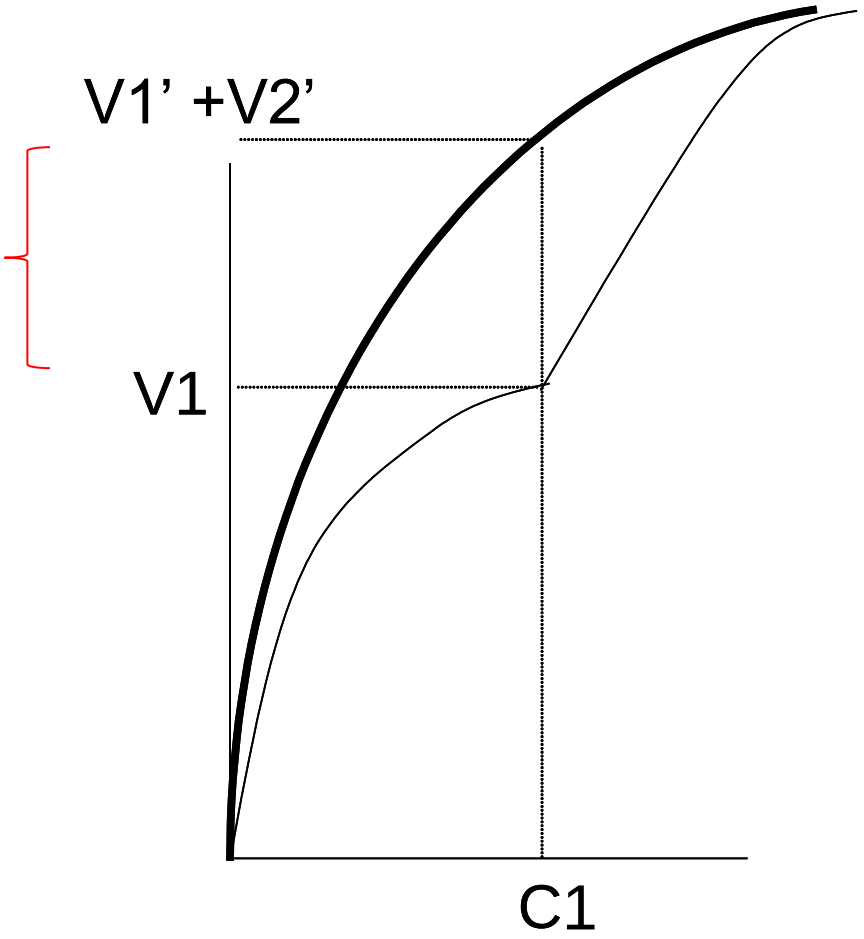


Project Level Buyup Alternatives

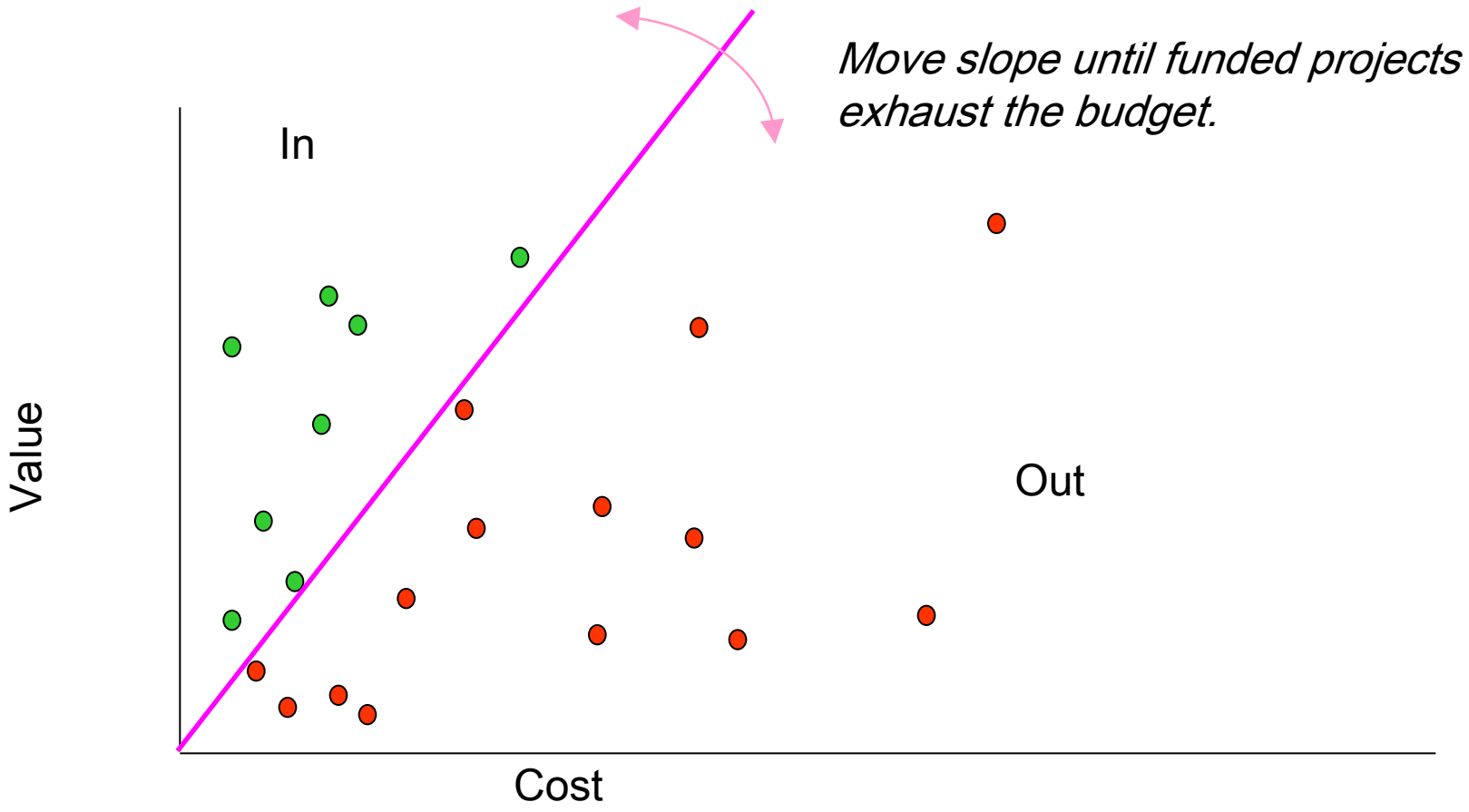


Adding value

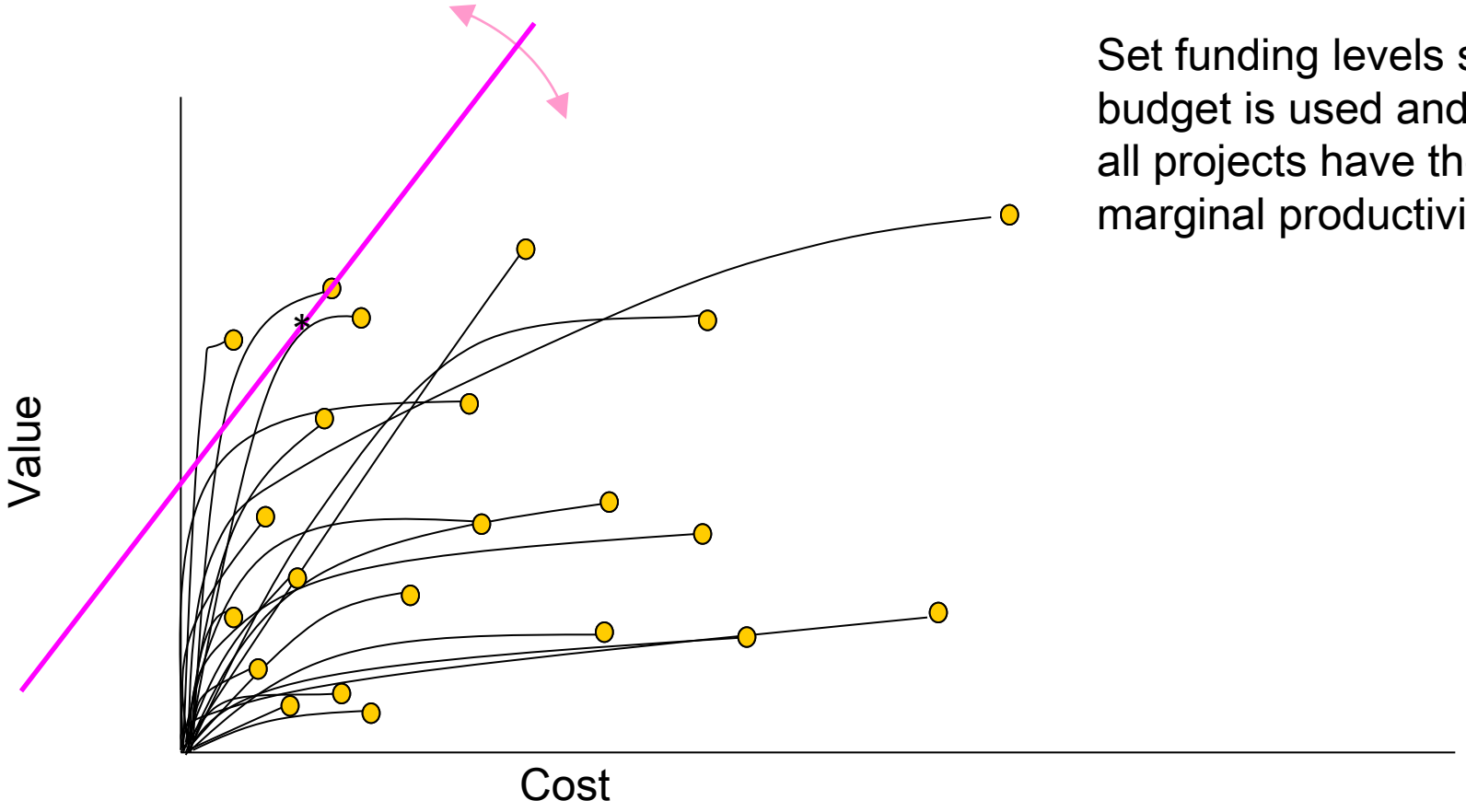
Value added at budget of C1



Simple PDA
Pick everything above target slope.

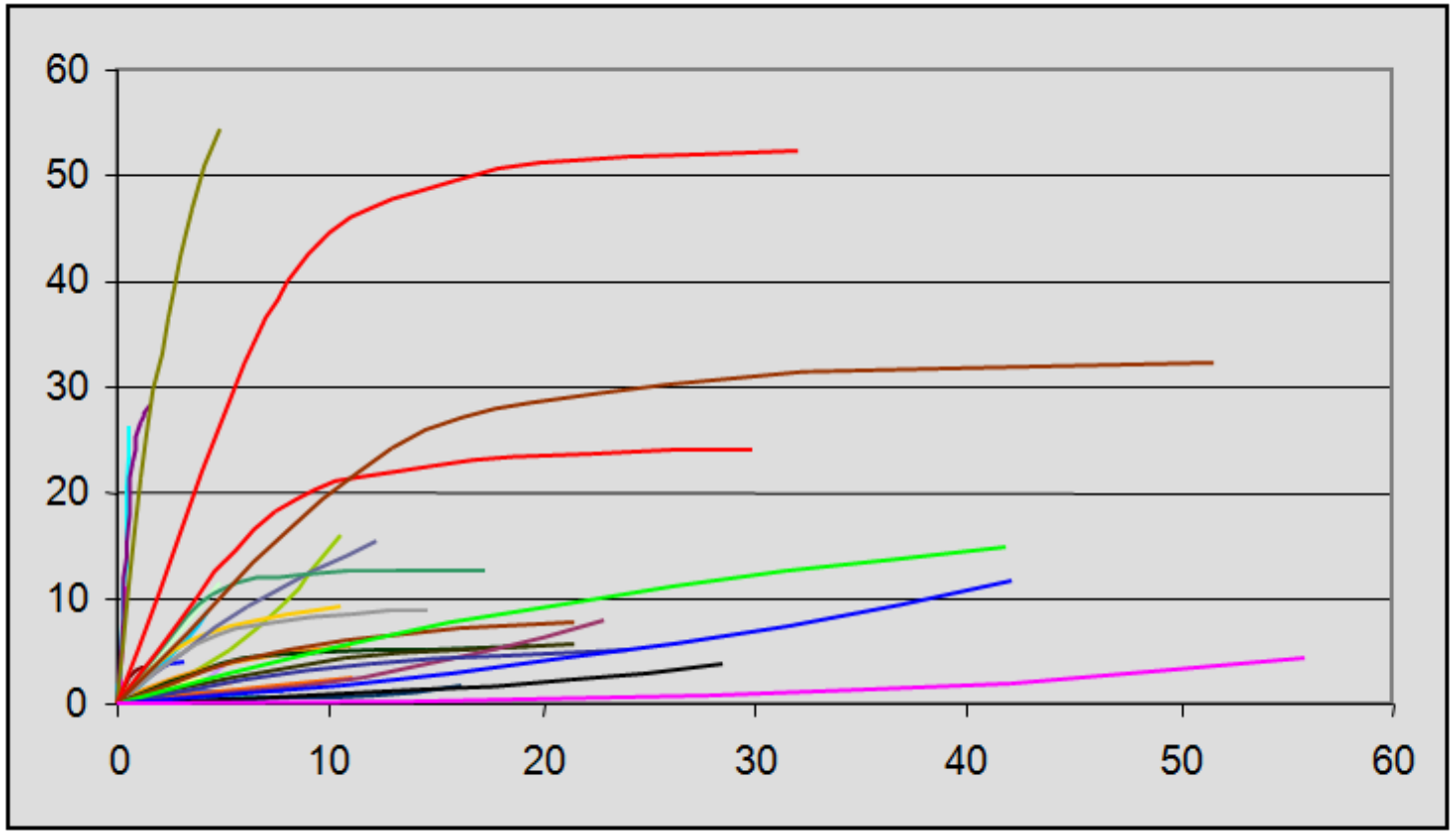


With partial-funding alternatives, apply target slope to projects.



Set funding levels so budget is used and all projects have the same marginal productivity

Project characteristics?



There is (are?) data

PROJECT	Core investment	First step investment	Second step investment	Third step investment	Core value	First step value	Second step value	Third step value	Maximum investments' bang for the buck	First midpoint implied exponent	Second midpoint implied exponent
1	0	3016	5408		32	33.2	34.3		0.425295858	-0.2903912	
2	0	8265	10080		28.8	47.4	49.4		2.043650794	1.3341932	
3	5304	6635	11066		30.5	40.1	40.3		1.700798334	16.84797	
4	0	2600			34.3	34.5			0.076923077		
5	0	1144			33.7	34			0.262237762		
6	808	5580	6662		0	22.8	34.2		5.842159207	-1.7374891	
7	788	1786	5170	5645	27	44.5	89.4	100	15.02985382	0.4044793	-0.9598412
8	140	625	1624		28.9	30.8	33.4		3.032345013	0.8381046	
9	572	3614	5726	11290	27.5	30.3	31.5	33.1	0.522485538	1.9913243	1.9981897
10	248	291			34.4	34.5			2.325581395		
11	0	2585	5171		34.1	34.2	34.6		0.096693096	-2.7716965	
12	0	493			33.8	34.2			0.811359026		
13	832	1424			33.9	34			0.168918919		
14	1436	1748			33.7	33.9			0.641025641		
15	0	4264	6396		33.8	34.1	34.2		0.062539087	0.7934905	
16	4425	5621	7701		33.8	34.3	34.3		0.152625153	-21.150831	
17	328	361			32.6	33.7			33.33333333		
18	0	118	501		33.9	34.1	34.2		0.598802395	4.5780823	
19	265	529			34.1	34.2			0.378787879		
20	0	416	832		33.6	34.2	34.5		1.081730769	1.3862936	
21	208	2430	5046		30.3	31.5	33.4		0.640760645	-0.5902268	
22	10400	15823	19764	29952	29.6	31.1	31.5	32	0.122749591	3.3266821	2.8665923
23	0	16245	23712		22.9	29.5	35.6		0.535593792	-1.462334	
24	28600	28600	28600		20.5	36.1	43.4		NA		
25	0	1088	5451		30.7	32.3	33.1		0.440286186	5.4618009	
26	0	2188			34.1	34.2			0.045703839		
27	156	15200	35770		21.2	21.3	29.4		0.230246532	-7.5579047	
28	3224	4673	6545		60.2	60.2	60.4		0.060222824		
29	33488	53470			21.5	50.2			1.436292663		
30	6240	6240	10033		27.9	32.1	33.4		1.450039547		
31	0	357	357		28	32.4	32.5		12.60504202		
32	459	1045	4056		37.1	37.8	38		0.250208507	9.2302573	
33	10400	16640	19282		27.4	36.5	37.3		1.114613826	2.8753521	

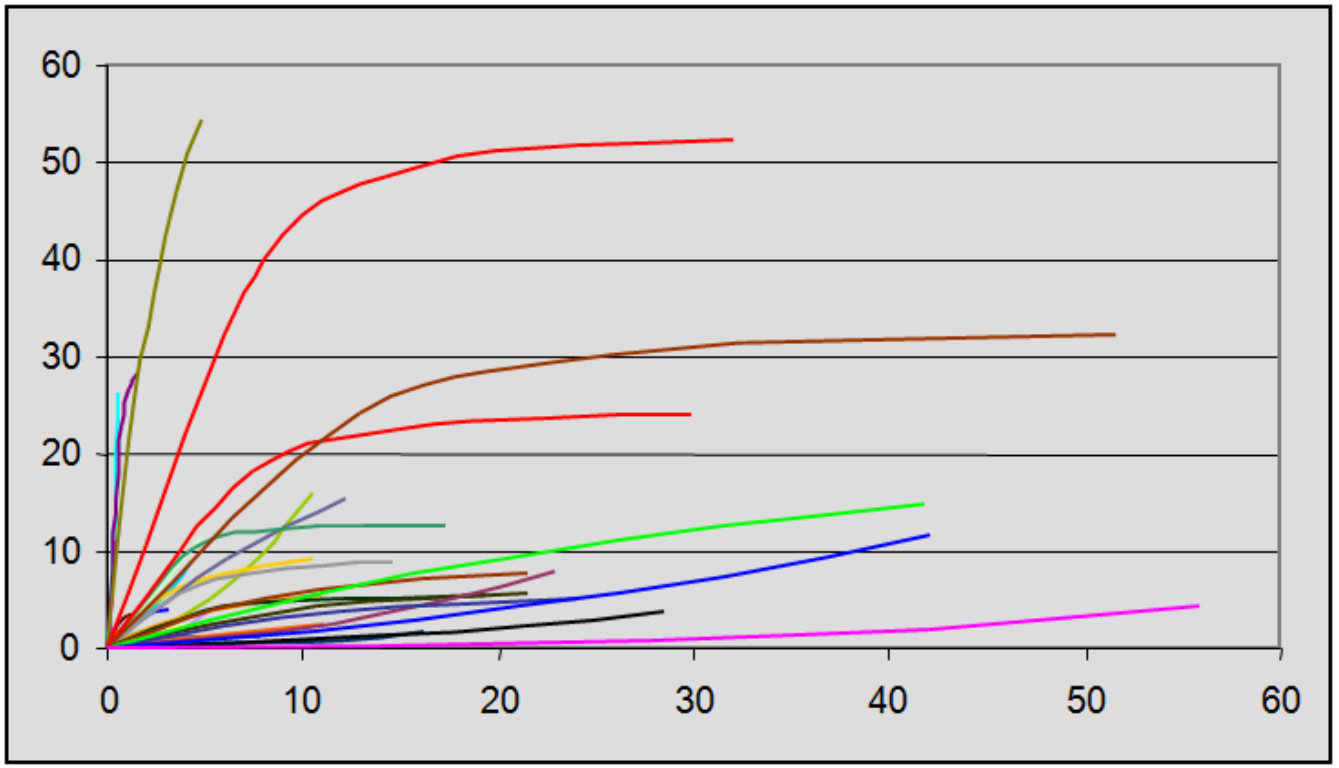
And you?

- How many alternatives?
- Basis of alternatives?
- Diminishing returns?
- Satisfaction?

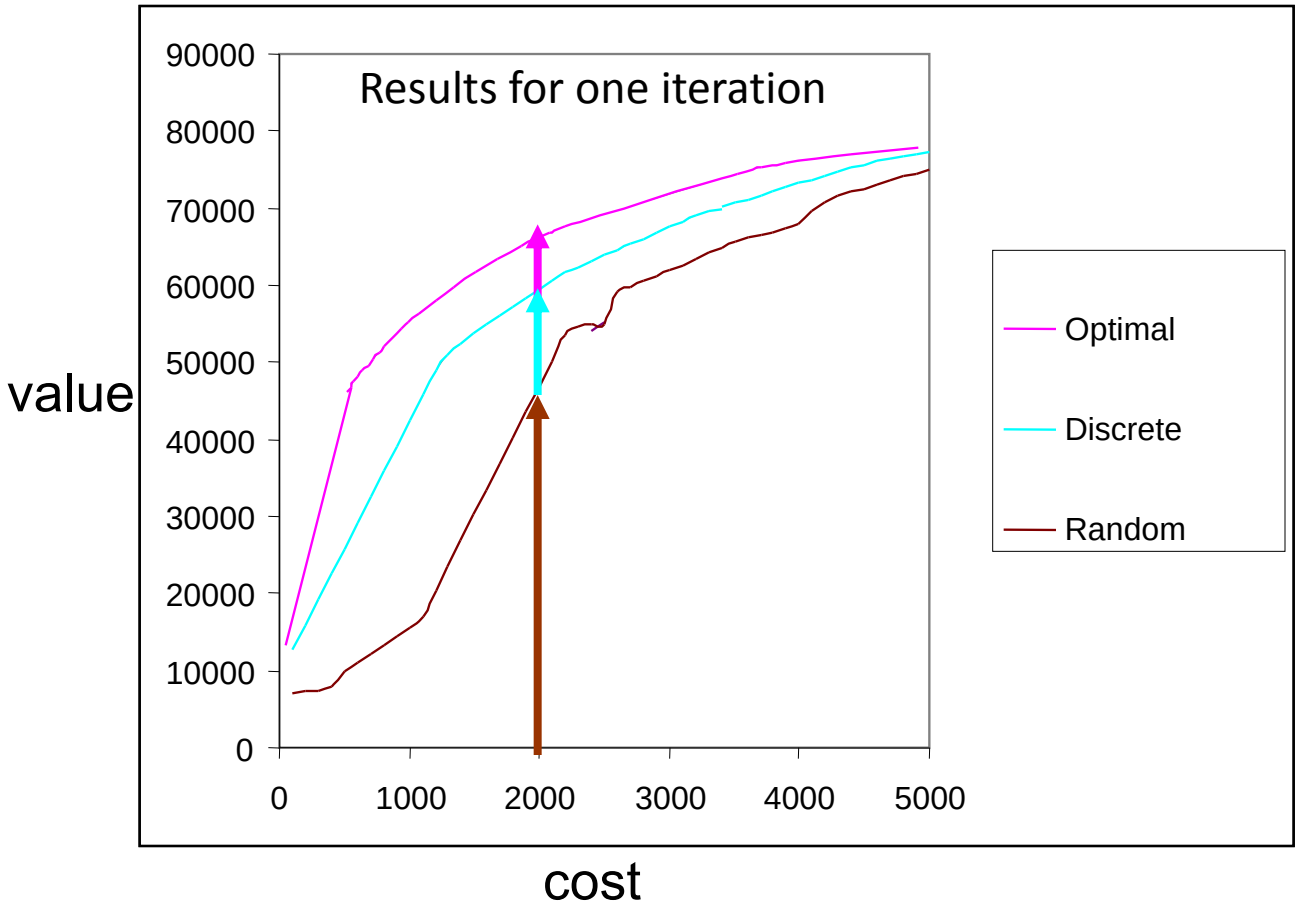
Estimate simulation settings

Source	Engineering projects	Pharma R&D projects	BASE-CASE
N	33	30	--
Cost (mean not important)	LogN(7.5,1.75)	LogN(3.3,2)	LogN(3,2)
Productivity	LogN(*na*,1.65) *values were in utiles*	LogN(3,1.2) *late stage bias*	LogN(2,$\sqrt{2}$) *incl. other data*
Curvature (<0→incr returns)	Uniform(-3,7) *23 midpoints*	U(-4,6) *41 midpoints*	U(-3.5,6.5)

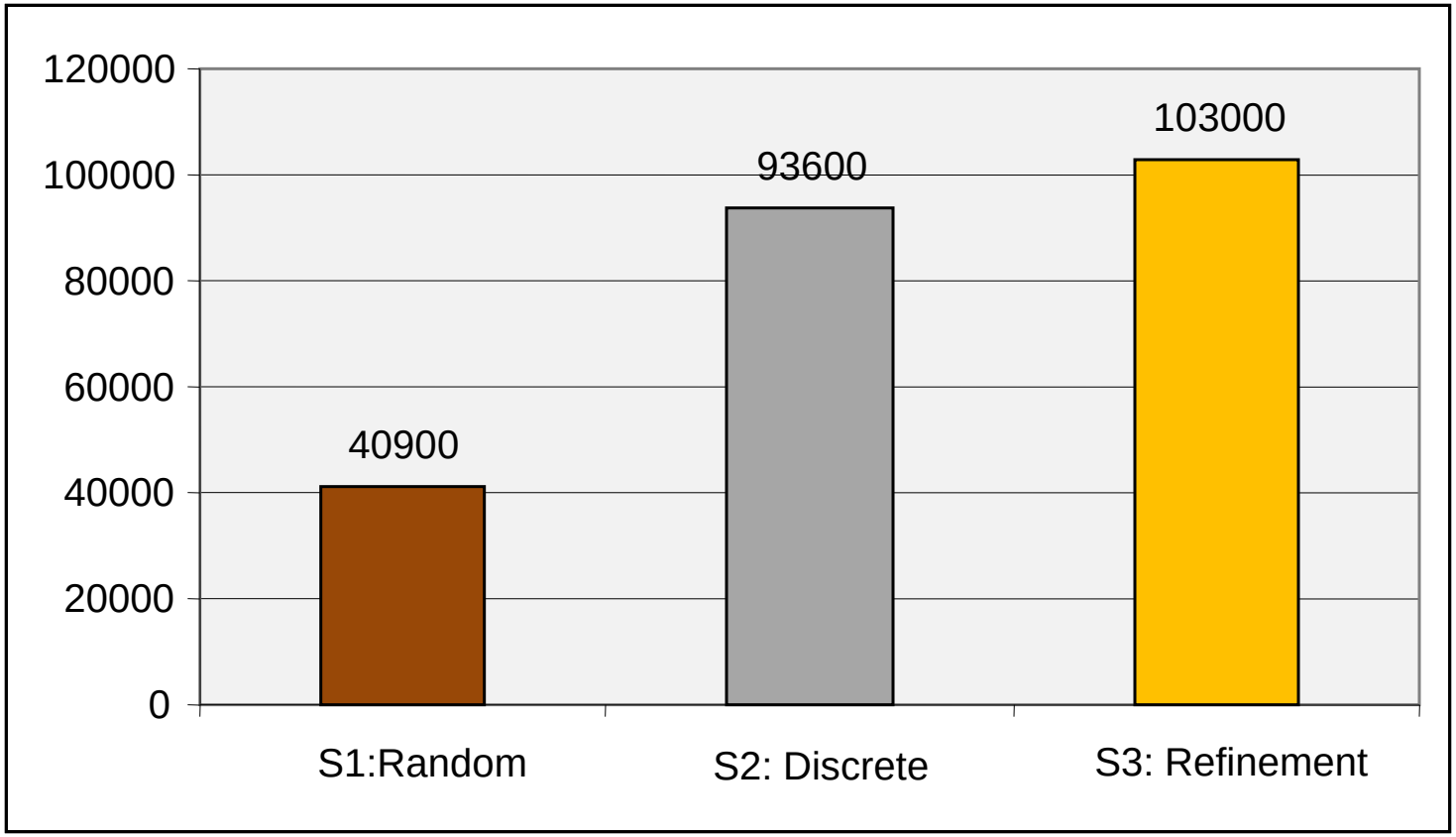
Simulated portfolios



Significant lift



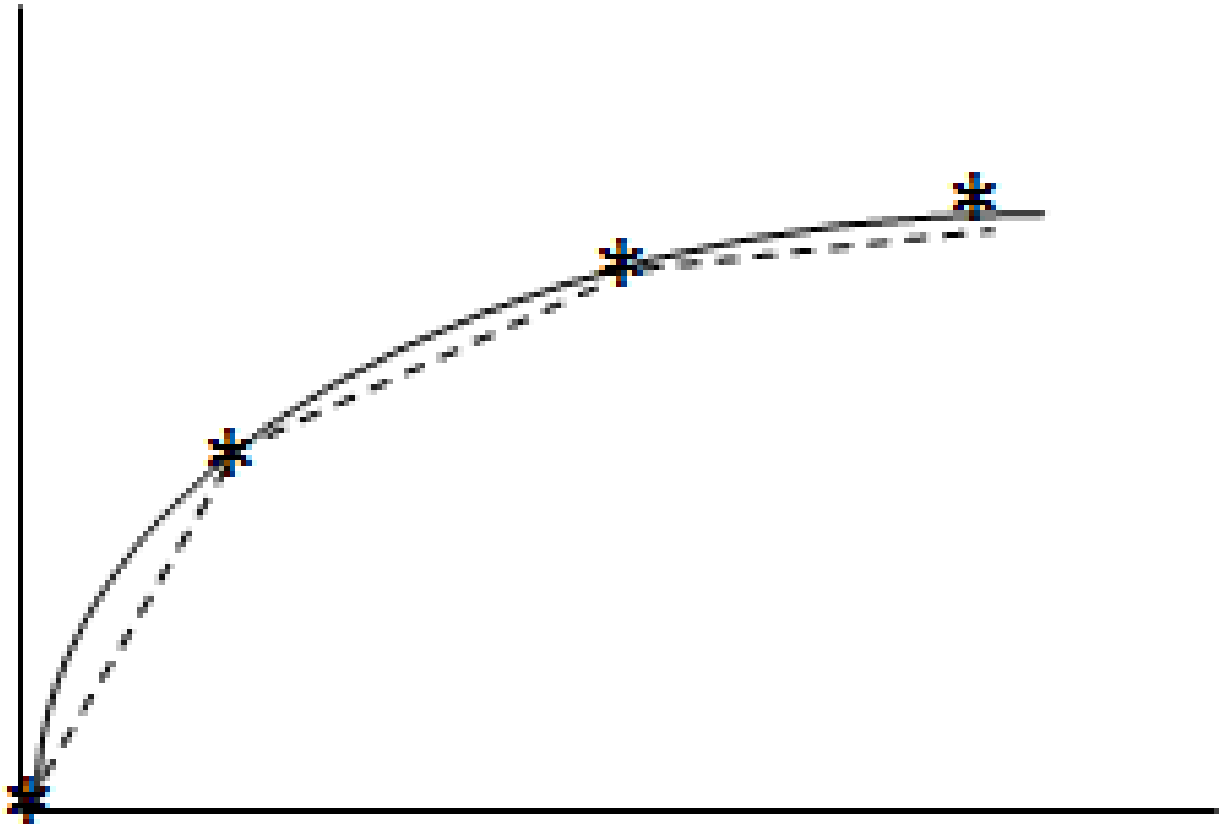
How much value added by PPM?



Sensitivity

- Base case: adds 15% of PPM value
- Lower budget: 19%
- Less variation: 9%
- More concave:36%

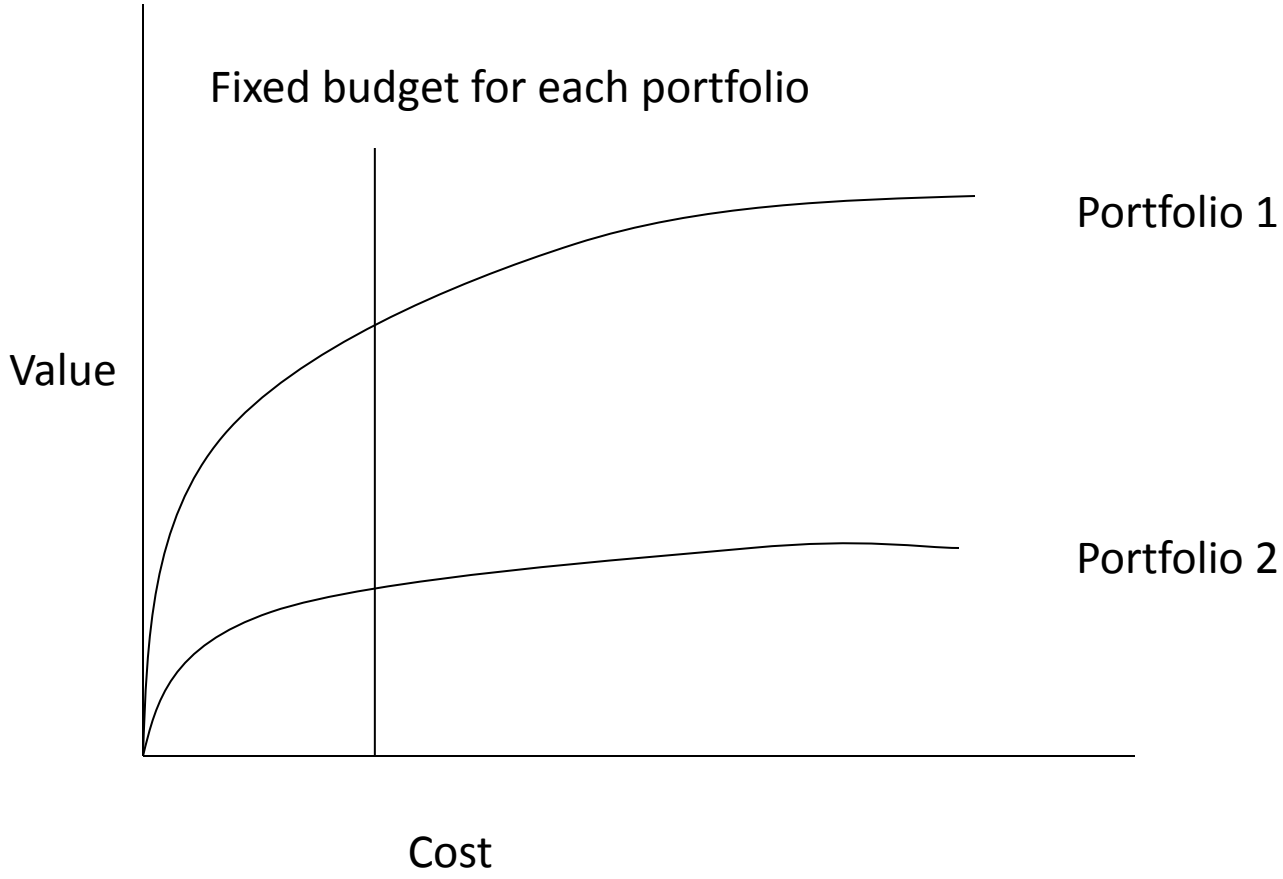
2 midpoints = 99% of PPM Value



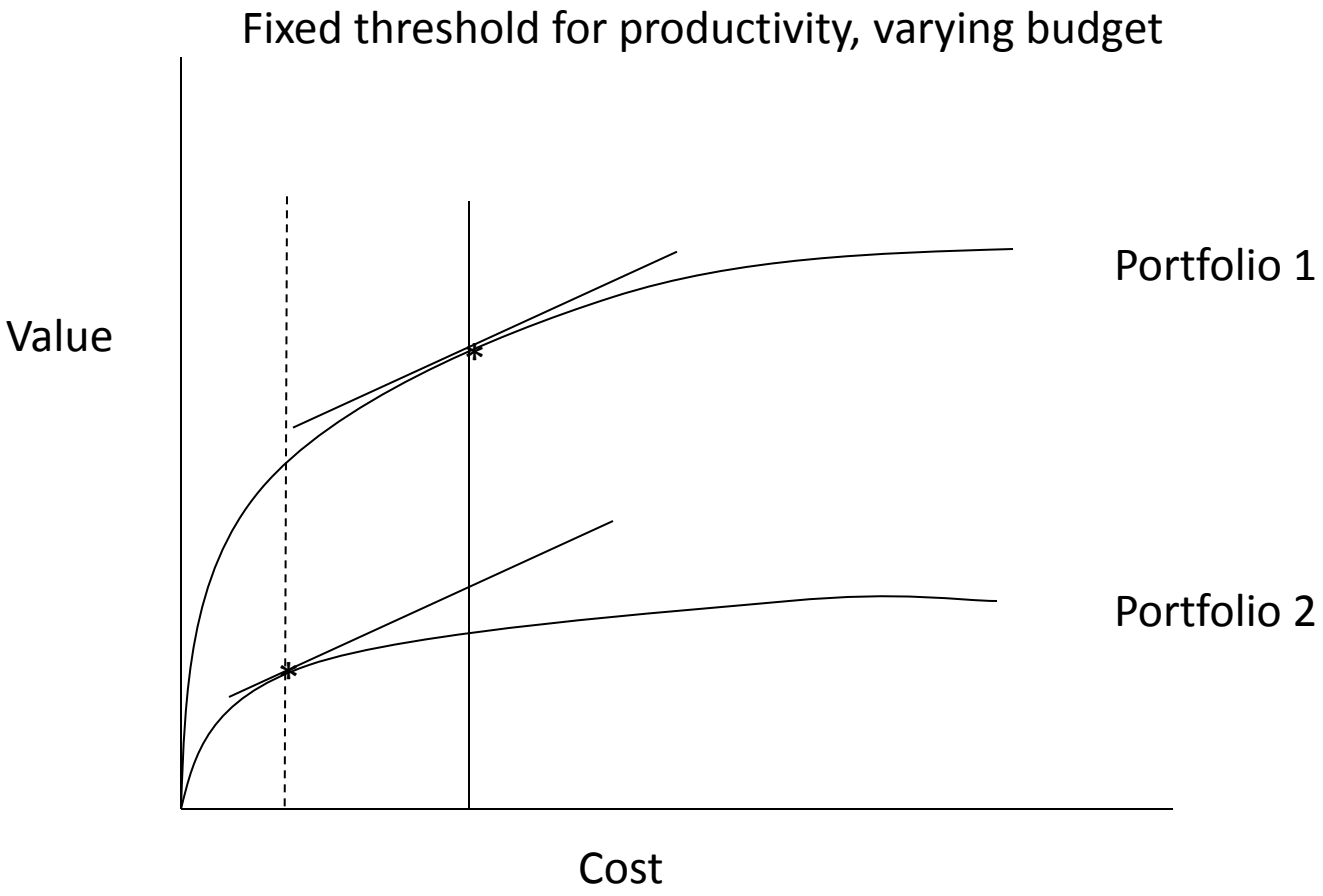
Say no to haircuts

- Only 33% of PPM Value

Application: Portfolios of portfolios



Sharpe & Keelin (1998) figured it out



The end

- For more info, working paper at:

http://scholarworks.umb.edu/management_wp/8/