Mahesh Lotteries Jump Logic

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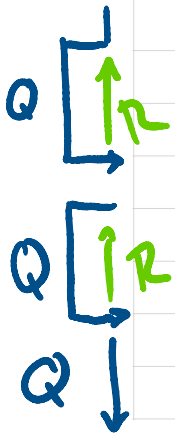
Updates - New Lottery Series (larger range of σ)

These lottery series provides a larger range of σ from 0.3 to 1.4.

The first lottery series

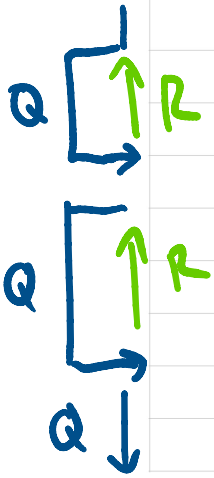
S. No	0.25	0.75	0.25	0.75	π(0.25)/π(0.75)
~~1~~	~~75~~	~~100~~	~~100~~	~~75~~	All choose option 1
2	75	100	108	75	0.8
3	75	100	114	75	0.7
4	75	100	120	75	0.6
5	75	100	132	75	0.5
6	75	100	148	75	0.4
7	75	100	181	75	0.3
8	75	100	265	75	0.2
9	75	100	750	75	0.1



Clearly, all respondents will prefer the first option to the second option in the first lottery, however, at some point, they may switch their preference from the first option to the second option. The last column gives us the associated value of π(0.25)/π(0.75) for the corresponding switching points.

The second lottery series

The second lottery series is designed based on the choice in the first lottery series. The series is of the form below, however, the exact values for X depends on the observed value of π(0.25)/π(0.75) obtained from the first series.



S.No.	0.25	0.75	0.25	0.75
1	0	100	100	0
3	0	100	X	0
4	0	100	X	0
5	0	100	X	0
6	0	100	X	0
7	0	100	X	0
8	0	100	X	0
9	0	100	X	0
10	0	100	X	0
11	0	100	X	0

The missing entries in the above series come from the following table depending on the value of π(0.25)/π(0.75) obtained from Series 1, by looking at the corresponding column.

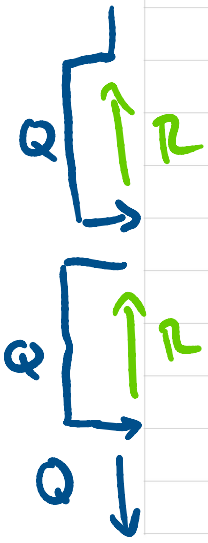
π(0.25)/π(0.75) →	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1
σ↓								
1.4	118	130	145	165	195	240	325	550
1.3	119	133	150	175	210	260	365	650
1.2	121	136	155	180	220	280	400	750
1.1	123	140	160	190	235	310	440	900
1	126	145	170	210	260	350	550	1100
0.9	130	150	180	225	290	400	650	1500
0.8	135	160	190	250	350	500	800	2000
0.7	140	170	210	300	400	650	1200	3200
0.6	150	190	250	350	500	850	2000	5000
0.5	165	220	300	450	750	1200	3200	DS

π(0.25)/π(0.75) →	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1
0.4	200	270	400	700	1200	3200	DS	-
0.3	250	400	600	1200	3200	DS	-	-

Series 2 therefore then lets us estimate σ. And σ will necessarily lie between 0.3 and 1.4 in steps of 0.1.

The third lottery series

We now have estimated σ and π(0.25)/π(0.75). We will now obtain π(0.75) and then we can therefore estimate δ and γ. We again adopt a hierarchical approach. The third lottery series is of the form below, however, the exact values for X depends on the estimate of σ from the previous series.



S.No.	1	0.25	0.75
1	100	20	100
2	100	20	X
3	100	20	X
4	100	20	X
5	100	20	X
6	100	20	X
7	100	20	X
8	100	20	X
9	100	20	X
10	100	20	X
11	100	20	X

σ →	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	1.1	1.2	1.3	1.4
π(0.75) ↓												
0.8	140	140	135	135	130	125	125	125	125	120	120	120
0.74	165	155	150	145	140	140	135	135	130	130	125	125
0.68	190	175	170	160	155	150	145	145	140	140	135	135

σ →	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	1.1	1.2	1.3	1.4
0.62	220	200	190	180	170	165	160	155	150	150	145	140
0.56	265	240	220	210	195	185	175	170	165	160	155	150
0.5	330	290	270	240	225	210	200	190	180	175	170	165
0.44	450	360	330	290	275	245	230	215	205	200	185	180
0.38	600	500	420	360	320	290	270	250	235	220	210	200
0.32	900	750	550	470	410	360	330	300	275	260	240	235
0.26	1500	1200	800	620	520	470	420	370	335	300	300	270
0.2	DS	DS	DS	DS	DS	DS	DS	DS	DS	DS	DS	DS

So, for example if σ were estimated to be 0.6 from Series 2, then the lottery series 3 would be :

S.No.	1	0.25	0.75
1	100	20	100
2	100	20	135
3	100	20	145
4	100	20	160
5	100	20	180
6	100	20	210
7	100	20	240
8	100	20	290
9	100	20	360
10	100	20	470
11	100	20	620

Therefore, from the switching point of the third series, we obtain π(0.75). Now that we have π(0.75) and π(0.25)/π(0.75) from the first series, we have an estimate of π(0.25). And, this will let us estimate δ and γ which we can obtain by using Excel Solver.

Finer Loss Aversion Lotteries (Steps of 0.25)

0.75	0.25	0.75	0.25	λ
-80	10	-100	10	No one switches
-80	10	-100	X	

i. r = 0.8

σ →		0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	1.1	1.2	1.3	1.4
λ↓													
0.25	1	11	11	12	12	13	14	15	16	17	19	20	22
0.5	2	12	13	14	15	17	18	20	22	24	27	29	32
0.75	3	14	15	17	18	20	23	25	28	31	34	38	41
1	4	16	18	20	22	25	28	31	35	38	42	46	49
1.25	5	18	20	23	26	29	33	37	41	45	49	53	57
1.5	6	20	23	26	30	34	38	42	47	52	56	60	64
1.75	7	22	26	29	34	38	43	48	53	58	63	67	71
2	8	25	29	33	38	43	49	54	60	65	69	74	78
2.25	9	28	32	37	43	48	54	60	66	71	76	80	84
2.5	10	30	36	41	47	54	60	66	72	77	82	87	91
2.75	11	34	39	46	52	59	66	72	78	84	89	93	97
3	12	37	43	50	57	65	72	78	85	90	95	99	103
3.25	13	40	47	55	63	71	78	85	91	96	101	105	109
3.5	14	44	52	60	68	76	84	91	97	102	107	111	114
3.75	15	48	56	65	74	82	90	97	103	109	113	117	120
4	16	52	61	71	80	89	97	103	110	115	119	123	125
4.25	17	57	66	76	86	95	103	110	116	121	125	128	131
4.5	18	61	72	82	92	101	109	116	122	127	131	134	136
4.75	19	66	77	88	99	108	116	123	128	133	136	139	141
5	20	71	83	95	105	115	123	129	135	139	142	145	147