cHoltLaury

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Questions

- How could competitive affect choices in the Holt and Laury (2002) gambles?

Conclusions

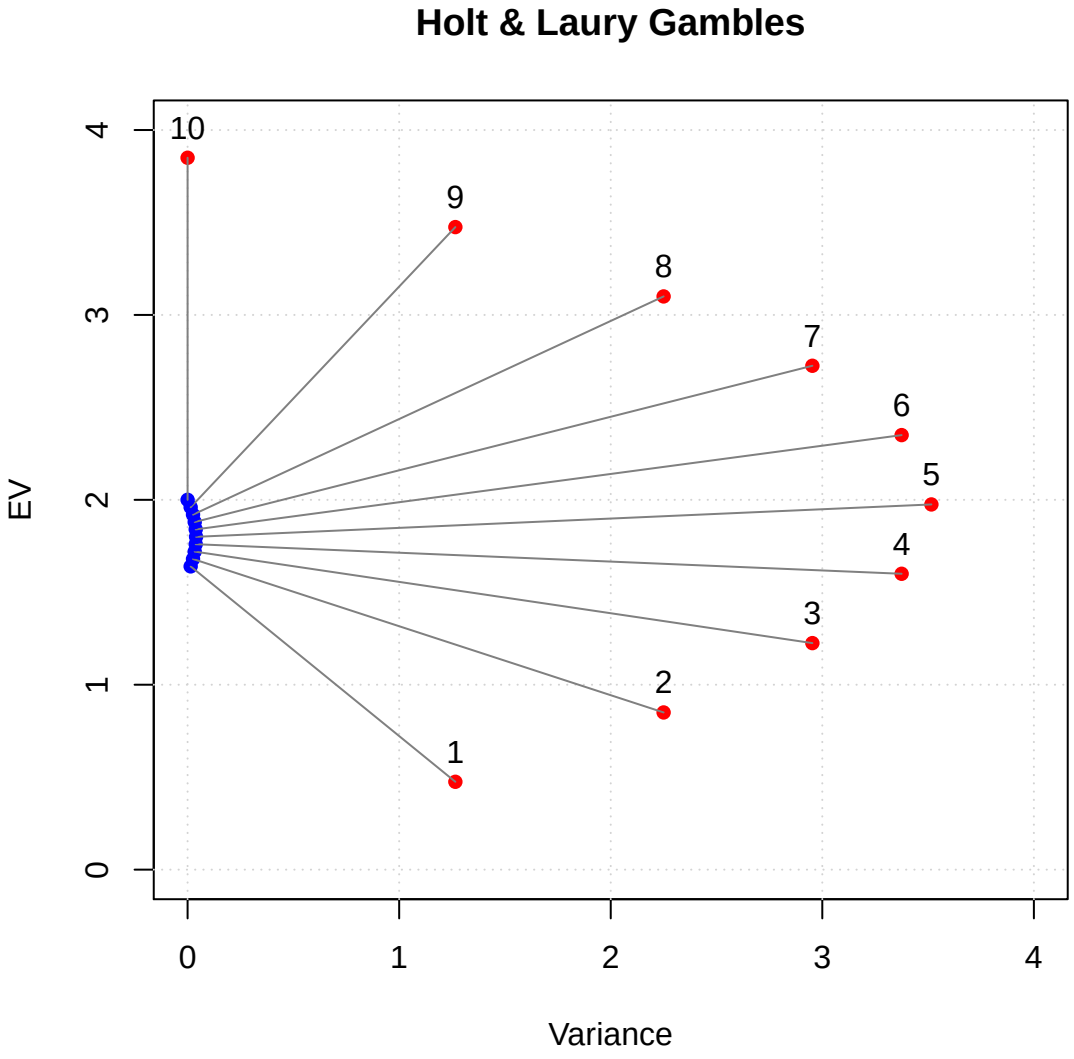
- For each gamble pair, the option with the highest EV is *always* the option with the highest probability of winning. This is independent of the variance of options.
- In other words, whether you're competing with someone or not, it is always better to choose the high EV option. In gambles 1-4 this will be the safe option. In gambles 5-10, this will be the risky option.

Holt and Laury Gambles

Here are the 10 gambles from Holt & Laury (2002)

index	a.x	a.px	a.y	a.py	b.x	b.px	b.y	b.py	a.ev	b.ev	a.var	b.var	ev.diff	high.ev.option
1	2	0.1	1.6	0.9	3.85	0.1	0.1	0.9	1.64	0.475	0.014	1.266	1.165	a
2	2	0.2	1.6	0.8	3.85	0.2	0.1	0.8	1.68	0.850	0.026	2.250	0.830	a
3	2	0.3	1.6	0.7	3.85	0.3	0.1	0.7	1.72	1.225	0.034	2.953	0.495	a
4	2	0.4	1.6	0.6	3.85	0.4	0.1	0.6	1.76	1.600	0.038	3.375	0.160	a
5	2	0.5	1.6	0.5	3.85	0.5	0.1	0.5	1.80	1.975	0.040	3.516	-0.175	b
6	2	0.6	1.6	0.4	3.85	0.6	0.1	0.4	1.84	2.350	0.038	3.375	-0.510	b
7	2	0.7	1.6	0.3	3.85	0.7	0.1	0.3	1.88	2.725	0.034	2.953	-0.845	b
8	2	0.8	1.6	0.2	3.85	0.8	0.1	0.2	1.92	3.100	0.026	2.250	-1.180	b
9	2	0.9	1.6	0.1	3.85	0.9	0.1	0.1	1.96	3.475	0.014	1.266	-1.515	b
10	2	1.0	1.6	0.0	3.85	1.0	0.1	0.0	2.00	3.850	0.000	0.000	-1.850	b

Here are the gambles represented in a coordinate space:



Introducing competition

For each gamble pair, I calculated the probability that gamble A would beat gamble B given a one shot game. For example, for pair 4, the probability that gamble A (the safe gamble) wins is $.40 \times 0.6 + 0.60 \times 0.60 = 0.60$. Here are the results

index	ev.diff	high.ev.option	p.a.wins
1	1.165	a	0.9
2	0.830	a	0.8
3	0.495	a	0.7
4	0.160	a	0.6
5	-0.175	b	0.5
6	-0.510	b	0.4
7	-0.845	b	0.3
8	-1.180	b	0.2
9	-1.515	b	0.1
10	-1.850	b	0.0

- Interestingly, it looks like the high EV gamble is always the gamble with the higher probability of

winning. For pairs 1 through 4, the safe gamble is both the high EV gamble and the gamble with the highest probability of winning. For pairs 5 through 10, the risky gamble is both the high EV gamble and the gamble with the highest probability of winning.