

A NOTE ON EVENTS WITH LOW PROBABILITIES

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A low probability event occurring is often characterised by a follow-up comment “we got the probabilities wrong.” But this is not necessarily the case. The low initial probability assessed by the decision-maker (DM) for the event in question may have resulted from the DM’s judgment that a number of unlikely lead-up conjunctions were necessary for this event to occur. And ALL of them holding was very unlikely but not impossible. After all, rank outsiders sometimes win in a horse race in spite of expert pre-race judgments by many bettors. Alternatively, the assessment could be a holistic judgment relative to all other possibilities. In either case, the probability arrived at is considered the DM’s degree of belief.

We have to assume that an assessed probability is “correct” in the eyes of the DM making it. Correctness may be impossible to evaluate. The Keynes comment “we simply do not know” would render correctness moot. The important point is that acknowledgment of an event’s possibility (however unlikely) should prompt decisions on what to do if it does in fact eventuate. This point was made by Mohamed El-Erian when the Lehman Bros. disorderly failure was allowed to happen by the Fed authorities in 2008. This was in contrast to the orderly liquidation of Long-Term Capital Management organised by the Fed in 1998. The Lehman decision roiled financial markets at the time.

Post-event comments on “correctness” may reflect the 20/20 hindsight phenomena. If the very unlikely does eventuate, any postmortem correction of faulty reasoning that mistakenly led to the low probability assessment initially would be a valuable by-product.

The illustrative probabilities for a 5-event problem below reveal some features of the “more likely” methodology of probability assessment. First note that using mid-points of the ranges with one calculation delivers probabilities that differ only at the third decimal place from those of the range procedure. Percentage probabilities are identical for both procedures in this case but may differ by 1% in general. The very unlikely event A uses a B/A range of 10 - 12 which may be arbitrary reflecting the assessment that something is 10 times better, worse etc. than something else (meaning a lot) without any real analysis. Equality of likelihood for events C and D requires the 1 – 1 range. And likelihood equality for these events implies B and D are compared as are C and E. That is, out-of-order pairwise comparisons are made and this could lead to a re-evaluation of the judgment that D and C have equal likelihood. Other out-of-order comparisons could help in deriving a final distribution. The ease and speed of spread sheet re-calculation makes trial and error a viable option for the DM. The methodology is very basic and very easy to use. This encourages DMs to think probabilistically.

ILLUSTRATIVE PROBABILITIES FOR PAIRWISE RANGE AND MID-POINT PROCEDURES

Ev	Pairwise Range		Probabilities						More Likely Values		
	Low	High	Low	High	Average	%	Mid-pt	%	Average	%	Mid-pt
A	1.00	1.00	0.014	0.007	0.011	1	0.010	1	Base	Base	Base
B	10.00	12.00	0.137	0.094	0.116	11	0.112	11	10.55	11.00	11.20
C	2.00	3.00	0.274	0.281	0.277	28	0.279	28	2.39	2.55	2.49
D	1.00	1.00	0.274	0.281	0.277	28	0.279	28	1.00	1.00	1.00
E	1.10	1.20	0.301	0.337	0.319	32	0.321	32	1.15	1.14	1.15
			1.000	1.000	1.000	100	1.001	100			