

Appendix D Summary of methodology used in the Prospect Theory part of the pilot study

1. Interviewees were presented with a combination of mixed, positive only, loss only and single outcome prospects, of the form $(x_1, p; x_2, 1-p)$. See Appendix B, Risk Bias Question.
2. Interviewees were requested to state what constituted large, medium and small scale projects in terms of the size of their company's operations. So the hospital group CEO for example stated that a large scale project would be USD50m, medium USD20m and small USD5m. The size of prospects shown in Appendix B Risk Bias Questionnaire were then notionally scaled up to reflect this size of project. E.g. the prospect involving Rand 500,000 was treated as USD50m. The USD based "scaled up" answers the interviewees gave were then "scaled down" appropriately to give a consistent set of answers across all companies of varying sizes, so that the answers were comparable.
3. The probability weighting functions were derived separately for positive and negative prospects. Positive prospects were taken to be those where the expected value, EV, was greater than 0, and vice versa for negative prospects. EV was taken to be $x_1 \cdot p + x_2 \cdot (1-p)$. In deriving the curves the prospects in Appendix B, Risk Bias Questionnaire, were used to derive the certainty equivalents EV; unlike K and T who used single outcome prospects only to derive certainty equivalents. This is due to the fact that businesses are rarely faced with a single outcome problem. (In reality, businesses are faced with uncertainty as the probability distributions are never known).
4. The probability weighting function, $\pi(p)$, was derived by setting $\pi(p)$ to be the probability which resulted in $x_1 \cdot \pi(p) + x_2 \cdot (1-\pi(p)) = EV$, the expected value. $\pi^+(p)$, $\pi^-(p)$ were separately derived for positive and negative prospects (based on whether the value of EV was positive or negative).
5. $\pi(p)$ was plotted against p . This was done separately for positive and negative EV's. In the pilot study the probability weighting function was regressed to the following functions for positive and negative prospects respectively:

$$w(p) = \frac{p^\alpha}{(p^\alpha + (1-p)^\alpha)^{\frac{1}{\alpha}}} \quad \text{for positive prospects,}$$

$$w(p) = \frac{p^\alpha}{(p^\alpha + (1-p)^\alpha)^{\frac{1}{\alpha}}} \quad \text{for negative prospects}$$

6. In the main study the data was regressed to a 3rd order polynomial, as in most cases there was little evidence of the S-shaped curve, except in the case of VGOLD, where for negative probabilities, the fit to the above curve in 5. produced a close fit.
7. The value weighting function was also derived using mixed prospects. The x axis was defined as the gain of the prospect, i.e. the EV based on the given probabilities as in 3. above. The value v(x) was defined as the value attached to the prospect by the interviewee. Plotting v(x) against x generated a near straight line through the origin. For the Pilot study, the K and T value function

$$v(x) = x^\alpha \text{ for } x \geq 0, -\lambda (-x)^\beta \text{ for } x < 0,$$

was fitted to the data, using non-linear regression. Parameters derived were $\alpha=.86$, $\beta=.96$ and $\lambda=1.08$, indicating very slight loss aversion. (K and T $\alpha=.61$, $\beta=.69$, $\lambda=2.25$).

8. For the main study a 3rd order polynomial was fitted to the data, providing a better fit than the value function curve proposed in 7. by K and T.