

DS-D50 COURSE PROJECT

The assigned course project is to take a case that you analyzed in a previous Kellogg class, and to re-analyze it using some of the methods of this course. Ideally, this should be a case for which you previously did some quantitative analysis in a spreadsheet. From the perspective of this course, you should recognize that your previous analysis estimated some quantities about which the decision-makers in the case would actually have had substantial uncertainty. In your new analysis, you should acknowledge this uncertainty by modeling these quantities as random variables. The magnitude of the uncertainty about these quantities (as measured by their standard deviations or quartile points, for example), the relationships of dependence (or independence) among these random variables, and the decision-maker's attitudes towards risk should be assessed in a way that seems reasonable and consistent with the information in the original case. Your probability and utility assessments may make use of an imaginary interview with the decision-maker in the case.

You should print out a copy of your analytical spreadsheet, with all formulas listed. Your output should also include computations of appropriate certainty equivalents and statistical summaries (expected value, standard deviation, cumulative curves) of the distribution of profit (NPV) or any other important "bottom line" quantity. Where possible, you should say how your results could be used to compare different decision options that were faced by the decision-makers in your case. Finally, where the distributional assumptions of your model seem most questionable, you might try to repeat the analysis for one or more alternative models with different assumptions.

You should include a short summary of the case (where "short" means less than a page in length). You should tell me the title of the case and in what course you previously used it, and you should make sure that I can find a clear explanation of every quantity in your spreadsheet model.

The course project should be the joint work of 1, 2, or 3 students. Of course, you may choose a case which only some members of your group have studied before.

If you prefer, you may analyze a case that is based on a real situation which one of you knows from work, instead of an academic case. In the analysis of such a real work problem, if you use confidential data then you may alter it by multiplying all quantities by some constant (like 2 or 10) or by disguising the application.

You should try to select a topic by the middle of the term. I want to discuss each group's planned project with them by around the sixth week of the term.

In any situation, a decision analyst could make every quantity a random variable and could try to do sensitivity analysis on every distributional parameter, but such a task would be endless! To keep things simple, you should ask yourselves which are the quantities about which the decision-makers would have had the most substantial uncertainty, and these are the quantities that you should treat as random variables in your model.

Even in simple quantitative models, the problem of finding a strategy that would be "optimal" among all possible strategies can become extremely difficult. So I am only looking for a serious evaluation and comparison of two or three alternative strategies for the decision maker in the case. (Of course, one alternative strategy can always be "sell the business now for \$X."). The goal is just to do a thoughtful and careful quantitative analysis of some reasonable decision alternatives, taking some of the decision-maker's uncertainties into account.