Session 6B: Post Class Test Solutions

1. e. Estimate distributions for the input variables that affect your output variable the most, i.e., when they change, the output variable changes a lot, and where you feel the most uncertainty about the value of the variable in the future.
2.
    a. Collect data on variables across time and across companies to get a sense of what the distribution looks like in terms of not just expected value but also in terms of symmetry and extreme values.
    b. If I cannot get historical or cross-sectional data, I would use common sense tests to get distributional fit and parameters. Some variables are bounded, and those bounds can give you a sense of whether a symmetric or skewed distribution will work best.
    c. If a variable is discrete, I would try to find a discrete distribution that fits (like the binomial) or even enter the distribution (outcomes and probabilities) directly.
3. ,
    a. If I have data across time or across companies on the two variables, I would look at whether there is correlation. Thus, if I believe that margins are higher when revenue growth is higher, I could look at the correlation between past growth and margins, with historical data, or correlation between growth and margins across companies to make a judgment.
    b. If a correlation exists, you can incorporate that correlation into your simulation.
    c. If two variables are positively correlated, and you ignore that correlation, you will be underestimating the output variable, when the input variables take extreme values. Thus, if growth is much higher than expected, ignoring the fact that margins are likely to be higher than expected, which is going to be the case when there is positive correlation, will lead you to under estimate value.
4. .
    a. The food delivery market is bounded in both directions, with an upper limit and a lower limit on value. The market share has an expected value of 40%, but you are far more likely to see big surprises on the downside and fewer on the upside (because the market share is high to begin with). On margins, the expected value is 30%, and you believe that surprises will be symmetric, as much on the upside and as on the downside.
    b. In those states of the world, where Zomato gets an even more dominant market share than expected (40%), it is also likely to have more pricing power, and earn higher margins. Because the two variables are positively correlated, Zomato's value per share will be higher in the higher market share outcomes and lower in the lower marker share outcomes. Ignoring this correlation will miss this effect.
5.
    a. I would take the project. The NPV is positive. The fact that I could be wrong 30% of the time is not a reason to reject it, since that would be double counting risk (because the NPV was based upon a risk-adjusted discount rate). The only exceptions are if I have more lucrative projects to invest in, than I have capital, and I could find an even higher NPV project, or one with a similar NPV and not as much down side or if I have debt or other fixed costs to cover, and the worst outcomes for this project could put my firm at risk.

b. I could focus on the variables that are causing the NPV to shift, and try to reduce their variability. For instance, if it is input cost variability that is the prime reason for the shifts in NPV, I would look for ways to lock in the price for the long term (even if it means paying more for the resource).