Fin 470: Insurance and Risk Management

Section 2 Time: 60 mins Mark: 40

A company plans to come up with either of three possible products (A, B & C). Each of these products have a simple set of outcomes, success (S), success but immediately imitated (I) and failure (F). The probabilities of each of the outcomes for each of the product are given by the following table:

|  |  |  |  |
| --- | --- | --- | --- |
| Product Type | A | B | C |
| S | 0.3 | 0.4 | 0.35 |
| I | 0.2 | 0.3 | 0.35 |
| F | 0.5 | 0.3 | 0.3 |

And the revenue from each of these products for each of the state are as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| Product Type | A | B | C |
| S | 100 | 120 | 90 |
| I | 80 | 60 | 70 |
| F | 60 | 30 | 60 |

The cost of all the three products are more or less in the similar. They all depend on one raw material, X, which has an uncertain possible set of costs in the future. The cost possibilities are:

|  |  |
| --- | --- |
| Possible Cost | Probability |
| 70 | 15% |
| 60 | 30% |
| 50 | 30% |
| 40 | 25% |

The above data were collected to help the company come to an idea of average profit for coming out with each of A, B and C, and also get an idea of the how the profit is spread out, i.e, how extreme the values can go, based on top hat simulation runs. But knowing the average profit and its spread is just half the job.

The next job is coming to the decision of making a product. And that depends on the stability of the economy as well. Although it’s very hard to predict the economy, the company formed an estimation that there are three possibilities – good, neutral and bad. The possibility of the economy being good in the future is 25%, and being neutral is 45%. The company can also go to a policy analysis firm who can tell you whether the forecasts of the future looks optimistic or pessimistic. But going to the policy maker will definitely cost them money. So the policy making firm has given them estimates, and from there they figure out that if the probability of the optimistic forecast given that the economy turns out to be good was 0.6, the probability of optimistic forecast given that the economy turns out to be neutral is 0.4, and the probability of optimistic future given that the economy turns out to be bad is 0.2.

The outcomes (profit) of each of the three types of products will also vary based on the future economic condition. But since the products are pretty similar to each other, the company assumes a similar effect of the economic condition on the profits of A, B and C. If the economy is good, the average profit (obtained from the simulation) gets multiplied by 1.5. If the economy is neutral, the profits get multiplied by 1, and if the economy is bad, the profits get multiplied by 0.5. For example, lets say if the average outcome of A is *p*, then outcome from A if the economy is good is 1.5*p*, if the economy is neutral then 1*p*, and if the economy is bad then 0.5*p*.

Finally, the cost of getting the services of the policy organization will cost \_\_

**Q1. Run 10 simulations (starting from 96 and going right in the Random Number Table) each for the S, I and F scenarios and for the revenues and costs for A, B and C. Calculate the average profit of A, B and C, and also report the range for each of the products [Hint: Range = Highest Value – Lowest Value] Also, for setting up the RNAs, follow the order the tables were organized. (20 marks)**

**Q2. Should the company go for extra information from the policy analysis company? If yes, then what will be their decision? If no, then what will be their decision? (15 marks)**

**Q3. If the company did go to policy analysts, being risk averse, what will be their decision? (3 marks)**

**Q4. Look at the range that you have obtained in the Q1. Does the information on range affect your decision on the choice of the product? How so? (2 marks)**