DECISION MAKING

Decision making, three types of knowledge with respect to outcomes are usually distinguished:

1. *Certainty:* Complete and accurate knowledge of outcome of each alternative. There is only one outcome for each alternative.

2. *Risk:* Multiple possible outcomes of each alternative

can be identified and a probability of occurrence can be attached to each.

3. *Uncertainty:* Multiple outcomes for each alternative can be identified but there is no knowledge of the probability to be attached to each.

Taking Decisions Under Certainty

If the outcomes are known and the values of the outcomes are

certain, the task of the decision maker is to compute the optimal alternative or outcome with some optimization criterion in mind.

As an example: if the optimization criterion is least cost and you are considering two different brands of a product, which appear to be equal in value to you, one costing 20% less than the other, then, all other things being

equal, you will choose the less expensive brand.

However, decision making under certainty is rare because all other things are rarely equal.

Linear programming is one of the techniques for finding an optimal solution under certainty. Linear programming problems normally need computations with the help of a computer.

Taking Decisions Under Risk

The making of decisions under risk, when only the probabilities of various outcomes are known, is similar to certainty.

Instead of optimizing the outcomes, the general rule is to optimize the expected outcome.

As an example: if you are faced with a choice between two actions one offering a

1% probability of a gain of $10000 and the other a 50% probability of a gain of $400, you as a rational decision maker will choose the second alternative because it has the higher expected value of $200 as against $100 from the first alternative.

Taking Decisions Under Uncertainty

Decisions under uncertainty (outcomes known but not the probabilities) must be

handled differently because, without probabilities, the optimization criteria cannot be applied.

Some estimated probabilities are assigned to the outcomes and the decision making is done as if it is decision making under risk.