Minicase Report

Eric Agency

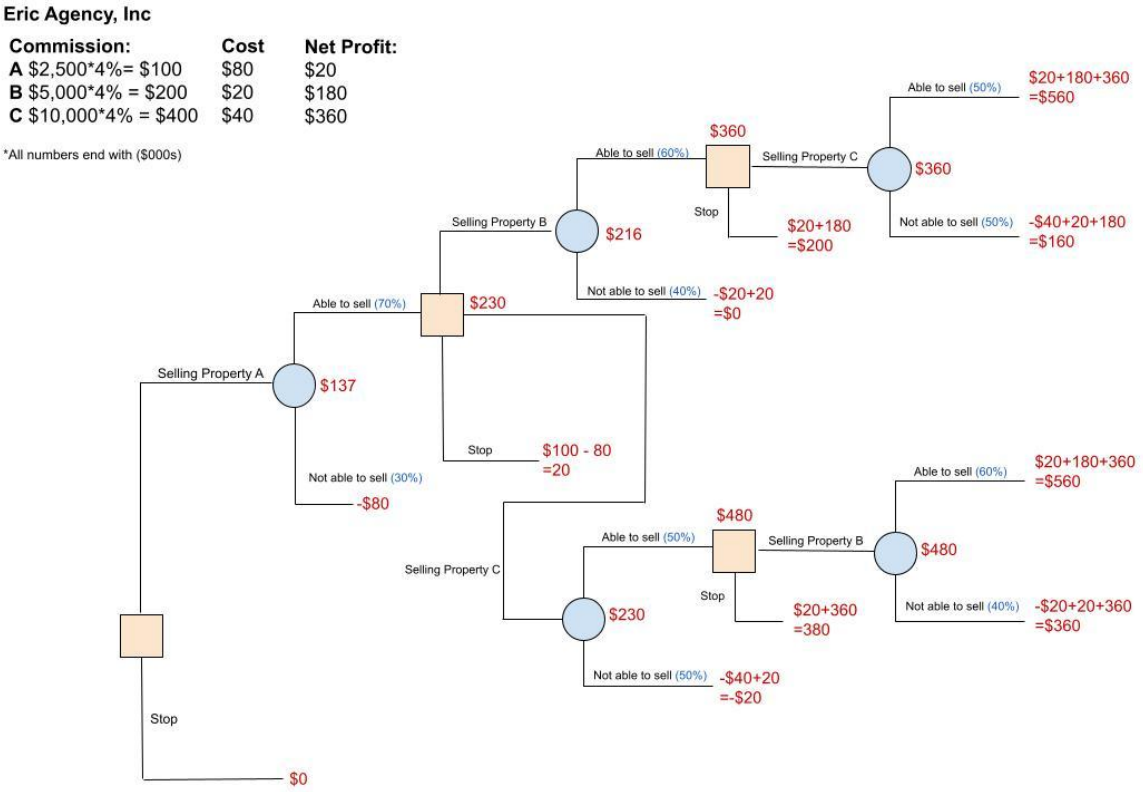
ISOM3900 - Decision Analytics

Introduction

Eric is struggling to respond to his client's requirement - Eric has to sell three properties, but he must sell property A first and he will be able to sell property B and C. Each sale consists of different profits and probability of successful sales. Decision Trees are excellent tools to help Eric to choose between several courses of action. They allow Eric to effectively lay out the options and investigate possible outcomes of choosing those options. They can help form a balanced picture of risks and rewards associated with each course of action. The first step in using a Decision Tree to evaluate a problem is to draw the decision tree.

Assignment

a) Draw a decision tree to find Eric's best choices.



Noted that the numbers in the following questions are end with ($000s).

b) Find the expected values of perfect information, respectively, about

i) whether A can be sold at the set price

With perfect information on the ability to sell property A at the set price, we know whether we are able to sell property A successfully within a month before we make any decision. The decision tree with perfect information is very similar to the decision tree without perfect information except that the event (circle point) now goes first before the decision point (in square) on selling property A or stop to sell property A. While we only have perfect information about whether A can be sold at the set price but not any perfect information regarding property B and C, the later part of the decision tree are about the same to the one in part (a) that we make decisions on selling property B or C before an event happens.

Refer to Appendix - Figure 1.

Expected value of perfect information about whether A can be sold at the set price:
$161 - 137
= $24

ii) whether B can be sold at the set price

Similar to the above question, with perfect information about whether B can be sold at the set price, we know whether we are able to sell property B successfully within a month before we make any decision. In this decision tree, the event of the ability to sell property B (circle point) now goes first before the decision point (in square) on selling property A or stop to sell property A and any other decision points. In this case, our decision point still starts from whether to sell property A or not because we must sell A before we can sell B or C. Although this time the decisions are indifferent as before, the decision tree actually developed into two different branches of the same decision point. After that, we have the same event as before, whether we are able to sell property A or not, and the same decision point on selling B or selling C or stop selling as in previous questions, but again, they are developing in the two branches until they go through all the decision points and events accordingly.

Refer to Appendix - Figure 2.

Expected value of perfect information about whether B can be sold at the set price:
$177.6 - 137
= $40.6

iii) whether C can be sold at the set price.

Similar to the above question, with perfect information about whether C can be sold at the set price, we know whether we are able to sell property C successfully within a month before we make any decision. In this decision tree, the event of the ability to sell property C (circle point) now goes first before the decision point (in square) on selling property A or stop to sell property A and any other decision points. In this case, our decision point still starts from whether to sell property A or not because we must sell A before we can sell B or C. Although this time the decisions are indifferent as before, the decision tree actually developed into two different branches of the same decision point. After that, we have the same event as before, whether we are able to sell property A or not, and the same decision point on selling B or selling C or stop selling as in previous questions, but again, they are developing in the two branches until they go through all the decision points and events accordingly.

Refer to Appendix - Figure 3.

Expected value of perfect information about whether C can be sold at the set price:
$186 - 137
= $49

Appendix

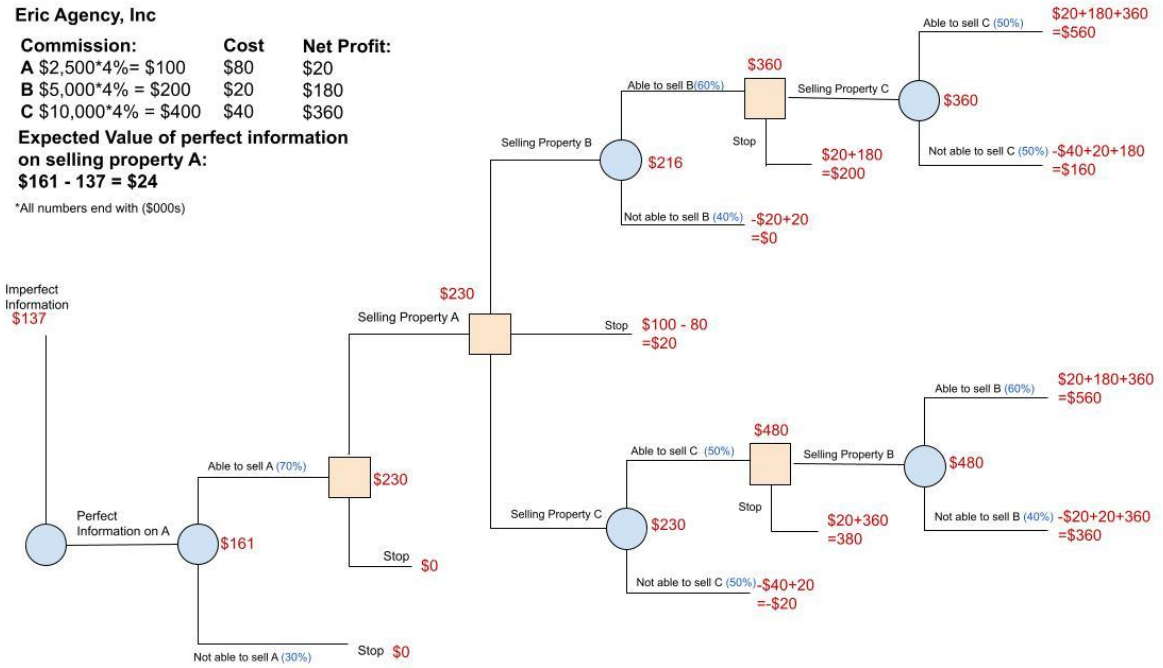


Figure 1 - Perfect information on A

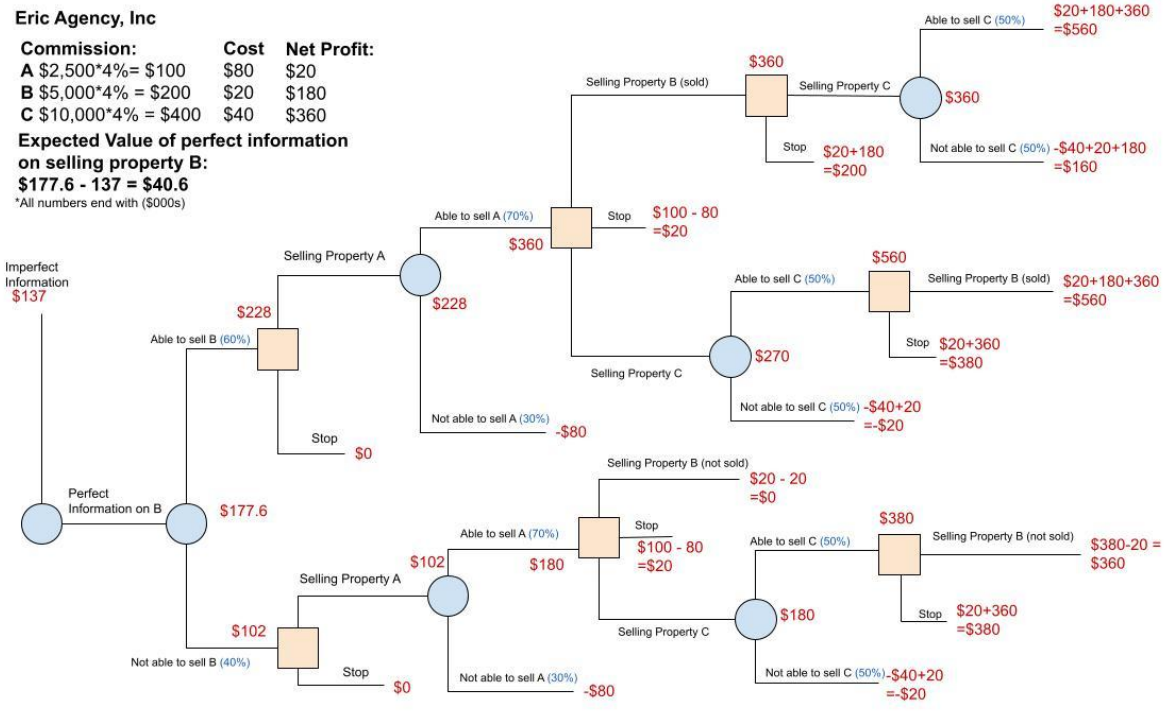


Figure 2 - Perfect information on B

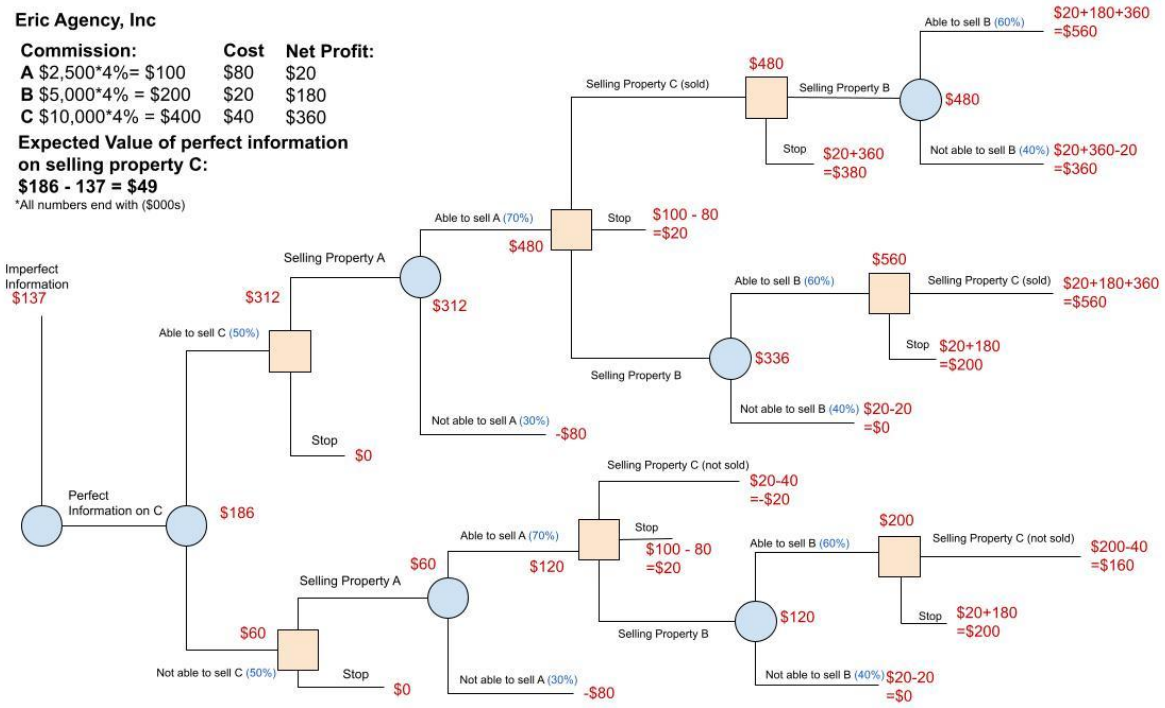


Figure 3 - Perfect information on C