MINI CASE AND SOLUTION

Mini Case: Allied Products

Allied products Inc., has recently won approval from the Federal Aviation Administration (FAA) for its Enhanced Ground Proximity Warning System (GPWS). This system is designed to give airline pilot's additional warning of approaching ground danger and thus help prevent crashes. Allied Products has spent $10 million in research and development the past four years developing GPWS. The GPWS will be put on the market beginning this year and Allied Products expects it to stay on the market for a total of five years.

As a financial analyst specializing in the aerospace industry for USC Pension & Investment Inc., you are asked by your managing partner, Mr. Adam Smith, to evaluate the potential of this new GPWS project.

Initially, Allied Products will need to acquire $42 million in production equipment to make the GPWS. The equipment is expected to have a seven-year useful life. This equipment can be sold for $12 million at the end of the five years. Allied Products intends to sell two different versions of the GPWS:

1. *New GPWS*—intended for installation in new aircraft. The selling price is $70,000 per system and the variable cost of production is $50,000 per system (assume cash flows occur at year-end).
2. *Upgrade GPWS*—intended for installation on existing aircraft with an older version and ground proximity radar in place. The selling price of the upgrade system is $35,000 per system and the variable cost to produce it is $22,000 per system.

Allied products intends to raise prices at the same rate as inflation. Variable costs will also increase with inflation. In addition, the GPWS project will also incur $3 million in marketing and general administration costs the first year (expected to increase at the same rate as inflation)

Allied products corporate tax rate is 40%. Assume that the equity beta is 1.2. A five-year U.S. Treasury Bond as a rate of 6.20 percent and the S & P 500 recent year's historical average excess return (i.e., the market return less the treasury bond rate) is 8.3%. Annual Inflation is expected to remain constant at 3%. Further, suppose Allied Products cost of debt is 6.2% and (although somewhat unrealistic) its debt-to-equity ratio is 50% and will remain at 50% for at least five years.

Commercial Aircraft Market

The state of the economy has a major impact on the airplane manufacturing industry. Airline industry analysts have the following production expectations, depending on the annual state of the economy for the next five years:

State of Economy	Probability of State	New Aircraft (year 1)	Annual Growth
Strong growth	.15	350	.15
Moderate growth	.45	250	.10
Mild recession	.30	150	.06
Severe recession	.10	50	.03

While probabilities of each state of the economy will not change during the next five years, airplane production for each category will increase, as shown in Table, each year after year 1. The FAA requires that these planes have new ground proximity warning systems, of which there are a number of manufacturers besides Allied Products.

Allied products estimates that there are approximately 12,500 existing aircraft that comprise the market for its GPWS Upgrade package. Due to FAA regulations, all existing aircraft will be required to get an upgraded ground proximity warning system within the next five years, again, not necessarily from Allied Products. Allied products believes that upgrades of the existing aircraft fleet will be spread evenly over the five years (the time value of money would suggest manufacturers defer purchasing upgrades until the fifth year; however, consumer demand for the additional safety will induce earlier upgrades).

Allied products uses the MACRS depreciation schedule (seven-year property class). The immediate initial working capital requirement is $2 million thereafter the net working capital requirement would be 5% of sales.

Allied products has a number of competitors both in the new GPWS and upgrade GPWS markets but expects to dominate the market with a 45% share.

1. Use the CAPM to determine the appropriate discount rate for this product.
2. Use computer spreadsheets such as Excel to analyze the project.
3. Will the GPWS project improve the wealth of Allied Product's shareholders?