



Finance 1

Final Exam Directions

[Finance 1 Final Exam Directions.pdf]

[This case study takes some verbiage to set up. The actual questions are few and straight forward. The work to arrive at various answers is not taxing. The long setup text is needful.]

Background

Apteryx Airlines has an older Boeing 737-300 jet that needs its D-Check shortly. The airline is considering purchasing a newer, but used replacement which has already had its D-Check recently.

The US Federal Aviation Administration (FAA) requires four levels of quality checks for a commercial airplane to keep its Certificate of Airworthiness (COA). The A-Checks and the B-Checks are done frequently, usually at the gate or at a local hanger. The C-Check can take 6000 hours of maintenance time and is done about every two years. The D-Check is done about every five years and requires a complete review of the plane. This includes removal of exterior paint to inspect the integrity of the fuselage. A D-Check takes two months and up to 50,000 work hours. It is very expensive. (In reality, the timeframes in this paragraph are approximations to simplify this exercise. The real-world timeframes are based on the number of cycles (take-offs and landings) and hours in the air. For the more correct information, see *Wikipedia, Aircraft Maintenance Checks.*)

Format

This exercise uses the three timeline format. Option A, then Option B, then the difference (Row 49). It is based on a five year analysis, because the next D-Check would be in five years.

Valuation Tool

For the exercises in BBO Finance 1, you have used the flawed payback method to get an answer to the various exercises. For this final exam, we will not use payback. Instead, simply inspect the total cash flows over the five years between the two options to determine an answer. The lowest cost wins. That is found in Cell L49. Don't get confused. Both options are negative. The "least negative" option wins.

For the record, using total cash is also a flawed method. It does not include the time value of money. That will be fixed in BBO Finance 2. BBO Finance 1 is about getting the cash flows right. The valuation of those cash flows is Finance 2.

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Scenario 1

Apteryx Airlines has a choice to (Option A) do the D-Check for two months and put the current 737 back into service for an additional five years -- or -- to sell its older 737-300 and buy a replacement. This is a classic case study of “fix or replace”.

Examine the Assumptions and the Cash Flows for each option. Note Cells F15 is automatically populated from answering Question 2. Also note, Cell F28 has a pull-down menu. It is initially blank. You will select the correct answer in Question 3 and then change the answer in Question 6.

Note in the Assumptions that there are two types of loads that accountants put onto direct labor at Apteryx Airlines: Payroll Load and Administrative and General (A&G) Load. You must determine which, if any, of these loads are relevant to this problem.

The payroll load represents the cash the company has to “pony up” each month for pension, social security, and healthcare. More hours worked, more payroll load to pay, in addition to the direct salary to the employee.

The A&G load represents the salaries of management, rents and leases, and other fixed expenses that get allocated to the work done, so they can be depreciated when the work is for a capital project.

For Option A: Note there is a line for A/B-Checks and another line for A/B/C-Checks. Odd years have only A/B Checks. Even years have all three, A/B/C-Checks. The D-Check is at T=0 (now). Note there is a negative cash flow for the lost profit while the D-Check is being performed. In this exercise, the time frame is five years. For Option A, Apteryx Airlines plans to sell the older plane in five years.

For Option B: Note there are six cash flows and the airline will sell the newer plane in five years. This is a principle that will be discussed in detail in BBO Finance 2. They really don't have to sell it, the time frames just need to be equal. Also note, the required cost for the A, B, & C-Checks are 20% less for this newer plane, compared to the older plane. This math is done for you in Rows 42 and 43.

Scenario 2

After beginning the D-Check, the maintenance people find stress corrosion cracking in a component of the older 737. \$3 million has been spent so far on the D-Check. Only \$700,000 remains to complete the check. The cost of a new component (and its installation) is \$1 million.

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Installing it will not delay the D-Check completion. Assume the sales price is not affected if the airline chooses to sell the older plane now.

Should they proceed and complete the D-Check or just sell the plane and buy a replacement? You will answer that in Question 7 below.

Assignment

Go the *Finance 1 Final Exam.xlsx*. There is only one worksheet “F1 Final Exam”. There are eleven questions.

The general assignment is to complete the cash flows for two scenarios and answer the eleven questions. The last four questions are general questions from the course, and do not refer to this “fix or replace” exercise.

Assignment for Scenario 1:

1. Answer Questions 1 through 5.
2. For Question 2 (Cell G55):
 - a. You need to determine from the discussion above (in red font) which if any of the two accounting loads are relevant to this valuation.
 - b. Then, determine the relevant *Hourly Rate (Loaded)* which automatically flows to Cell F15. Calculate this on scratch paper or alternatively you can use Cell J15 and use a formula.
 - c. Then use the pull-down menu in Cell G55 to select your answer.
3. For Question 3 (Cell G57):
 - a. Determine the cash flow for Cell F28. It is the *Hourly Rate (loaded)* times *D-Check Required Hours*. Use scratch paper if necessary. Don't forget the minus sign.
 - b. Then select one answer from the pull-down menu in Cell G57.

Assignment for Scenario 2:

1. Answer Question 6: Determine the future cash flow (at T=0) for the D-Check if the airline decides to install the component and finish the D-Check. This math could be done in your head from the first paragraph in Scenario 2 above. Use the pull-down menu and select your answer.
2. Answer Question 7 by inspecting Cell L49.

General Questions:

1. Answer Questions 8 through 11.
2. Refer to the course material as necessary.

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Completing the Final Exam and Altruism

Return to BizBasicsOnline.com Final Exam and enter your answers from the spreadsheet. You will need a 70% or better score to receive the certificate of completion.

The Biz Bucks Guy, in a rare moment of altruism and humanity, has provided the answers to the first seven questions through the Instant Feedback cells. You should have no problem getting the correct answers for them in the course software. This means to get 70% on this final exam, you will need to get only one of the general questions correct. Good luck anyway. These seven answers have been provided to help with the learning experience. Loads, Sunk Costs, and Opportunity Costs have many nuances and questions can be a challenge to newbies.

For the record, don't think this charity is a trend for other exams in BBO.