Assignment 3

Due: Tuesday, November 3, 2026 by 11:59 p.m. Central

1 Description

You are the manager of TAMU Inc, which produces widgets. The board asked that you take on one large project soon. Your staff has found two mutually exclusive projects for you to choose between: (*i*) Project New and (*ii*) Project Replace.

Project New is a new venture, where the firm will be going out of its usual line of business to compete in a new arena selling a new product. Project New will have no impact on the current operations of the firm. It is predicted that Project New will run for five years. The new product will be sold directly to consumers for $50. Variable costs and fixed costs to produce the product are expected to be $30 per unit and $30,000 per year, respectively. The number of units sold over the five years of this project are expected to be 5,000; 7,500; 12,000; 14,000; 15,000. To begin Project New the firm will have to spend $500,000 on new machinery, which machinery is classified as an industrial machine and depreciates as a 7-year MACRS asset. The market value of the machinery will be 25% of the purchase price at the end of year 5, at which point the machine will be sold. Finally, in order to accomplish this new project the firm will need an immediate infusion of $10,000 in net working capital, and will need to maintain net working capital of 5% of revenue each year. The net working capital will be recaptured at the end of year five.

Project Replace. The usual replacement of the machinery for the normal business operations of TAMU Inc is five years from today. In fact, the machinery currently in use has a current book value of $20,000 but a market value of only $10,000 if sold today. It is expected that in five years the machinery would be worthless. Also, the machinery can be depreciated by $4,000 annually for the next five years, for tax purposes. However, instead of just waiting for the usual replacement five years from now, TAMU Inc could replace the machinery today with new, short-term, high efficiency machines at a cost of $180,000. This new machinery would improve operations by reducing annual costs by $75,000. Additionally, this machinery can be classified as a 3-year asset, allowing it to be depreciated using 3-year MACRS. Like the old machinery, this new machinery will be worthless in five years, and then the usual replacement will take place.

For either Project New or Project Replace, assume that the projects will begin immediately; Year Zero will require capital expenditures and net working capital adjustments. Furthermore, TAMU Inc's tax rate is 34% and its cost of capital is 11%.

Each group will work together to study Project New and Project Replace. You will model both projects in Excel, answer the questions below, and make a determination of which project you will choose. Each group will produce two documents as deliverables to complete the assignment.

The objective of this assignment is to (*i*) practice calculating Free Cash Flow for future projects, (*ii*) practice applying the NPV Decision Rule, and (*iii*) practice and showcase clear writing skills.

2 MACRS Depreciation Schedule

Machinery	Year 1	Year 2	Year 3	Year 4	Year 5
New: 7-year MACRS	14.29%	24.49%	17.49%	12.49%	8.93%
Replace: 3-year MACRS	33.33%	44.45%	14.81%	7.41%	0.00%

3 Deliverables and Submission

Submit **two files**: an Excel workbook (`.xlsx`) and a PDF containing the board memo and appendix. Include your group identifier and members' names in both. One member should upload both files to Canvas and check that the submission is recorded. Contact the instructor if it does not appear correctly for your group. **Total: 10 points, 5 per deliverable.**

Excel Workbook (5 points)

The bulk of your work will be here. Use best practices to create an Excel file that you use to analyze Project New and Project Replace. The file should be easy for anyone from class—not only members of your group—to understand and use. Do not hard code answers; list assumptions/parameters and use formulas so that changing an input updates outputs automatically. Finally, you may use more than one sheet of the Excel file if necessary (*hint:* this is probably necessary).

Evaluation: Completeness (1.0), accuracy (3.0), structure and usability (0.5), and documentation/assumptions (0.5).

Further Guidance:
If you feel like you're missing a piece of information to correctly answer the question, do the following: slow down, look closely at the problem and examples, if you can't find the information you think you need, make an assumption, footnote it in the spreadsheet, and move on.

Board Briefing Memo (5 points)

Write as the manager informing the board of your decision. Explain the alternatives, state your recommendation, and support it with valuation and risk analysis. Include at least one small, labeled figure or table that helps the board assess your choice.

Evaluation: Clear decision and justification (2.0), use of analysis (1.0), clarity and professional writing (1.0), and an effective figure/table (1.0).

Further Guidance:
A short report means at most the front and the back of one sheet of paper (the appendix can be another sheet). The appendix is directed to me and other graders, not to the Board of Directors. For the report, use the questions below—the ones that you answer in the appendix—to guide some of what you write. For example, the board is going to be interested in sensitivity analysis.

4 Appendix (to submit with Memo)

1. List annual Free Cash Flow for Project New.
2. What is the Net Present Value of Project New?
3. For Project New, Net Present Value is most sensitive to 20% changes in which of the following parameters?
    - Sales Price.
    - Variable Costs.
    - Fixed Costs.
    - Cost of Capital.
4. For Project New, holding all other parameters constant, what is the break-even sales price?
5. List annual Free Cash Flow for Project Replace.
6. What is the Net Present Value of Project Replace?
7. For Project Replace, Net Present Value is most sensitive to 20% changes in which of the following parameters?
    - Cost Savings.
    - Cost of New Machine.
    - Cost of Capital.
8. For Project Replace, holding all other parameters constant, what is the break-even annual cost savings?
9. Since Project New includes entering a new line of business, the Board of Directors may consider it more risky than the usual course of business. What is the Net Present Value of Project New if the Board of Directors suggests a cost of capital of 15% for that project?

5 Grading Rubric: Assignment 3

Part A – Excel Workbook (5 points total)

Criteria	Points	Score	Comments
Completeness – both projects modeled; required cash-flow lines and calculations supporting all nine appendix answers	1.0		
Accuracy – values and formulas correct; no hard-coded results	3.0		
Structure and Usability – clear tabs, labels, links, and audit trail	0.5		
Documentation – assumptions listed or footnoted; clean formatting	0.5		
Excel Subtotal	**5.0**		

Part B – Board Briefing Memo (5 points total)

Criteria	Points	Score	Comments
Decision and Justification – explicit choice, tied to quantitative results	2.0		
Use of Analysis – draws on appendix answers and model outputs	1.0		
Clarity and Professional Writing – concise, structured, polished	1.0		
At Least One Small Figure/Table – effective, labeled, supports conclusion	1.0		
Memo Subtotal	**5.0**		

Overall Comments:

Total Score (out of 10): _____