Introduction to Finance - II
Capital Budgeting 1 Quiz from 2018

Read the questions carefully. Don't make them harder than they are! Answer succinctly and precisely. Show all of your work.

Suppose that you are a financial analyst at Apple. Apple is developing a new Mac server, which it plans to introduce in 2 years. Each server will require one principal CPU chip. Dev Teluja, Apple's chief systems engineer, suggested to Apple's CFO, Luca Maestri, that Apple should manufacture the principal CPU chips for the new servers in-house rather than buying them from Intel and AMD (as it currently does). Luca has asked you for an opinion on whether Dev's proposal should be pursued. If Apple makes the chips in-house it would build a new plant in Salem, Oregon on a 60-acre site that Apple already owns. This land was just appraised at $175,000 per acre. According to Dev's engineers, building the new fabrication facility would take 2 years and require capital outlays of $75 million immediately, $100 million in one year, and $75 million in two years (upon completion). This project would be a 7-year MACRS asset under the IRS code. The relevant MACRS schedule is provided below.

Luca forecasts that Apple will sell 1 million servers in the first year of the plant's operation (i.e., Year 3), and that unit sales will decline by 3% per year over the next 10 years. AMD and Intel are willing to sell the chips to Apple for $375 apiece. Dev is confident that the new facility would be able to produce the same chips for $300 apiece. Dev says that the plant and equipment will have a salvage value of $5 million, and that the plant will require an inventory of components worth $30 million to stay in operation. Dev has previously worked at both Intel and AMD, and he is confident that the chips manufactured at Apple's proposed facility would meet the same quality standards as Intel and AMD.

Clarifying the time line, the project will not be operational until two years from now. So on an annual basis the first operating savings and depreciation start in Year 3. The project will operate through Year 12, and be terminated at the end of Year 12.

Apple has a beta of 1.1, and a capital structure with 88% equity and 12% debt. It is in a 25% statutory tax rate. Its 30-year bonds currently sell at a 60 basis point spread over the 30-year US Treasury Bond. The yield to maturity on the 30-year US Treasury Bond is 4.5%. The equity market risk premium is 5%.

MACRS 7-year depreciation schedule

Year	Depreciation (%)
1	14.29
2	24.49
3	17.49
4	12.49
5	8.93
6	8.92
7	8.93
8	4.46

1. **(15 points)** What is the appropriate discount rate used to evaluate the present value of this project – What is the value, what is it called, why do we use it?

2. **(13 points)** What are all of the relevant cash flows to evaluate this project at Time 0? What is the present value of these cash flows?

3. **(13 points)** What are all of the relevant cash flows to evaluate this project at Year 2? What is the present value of these cash flows?

4. **(13 points)** What are all of the relevant cash flows to evaluate this project at Year 3? What is the present value of these cash flows?

5. **(13 points)** What are all of the relevant cash flows to evaluate this project at Year 4? What is the present value of these cash flows?

6. **(13 points)** What are all of the relevant cash flows to evaluate this project at Year 12? What is the present value of these cash flows?

7. **(10 points)** The NPV of this project is $56 million. What does that mean–should Apple invest in the chip manufacturing plant?

8. **(10 points)** Is the price at which Apple sells the new servers relevant to answering Luca's question? Explain.