

Question 1

You will accept the offer if the price suggested is lower than the PV of the Cash Flows you will get from buying the house. Those Cash Flows are the rents after the lease expired and the cost of the lease you will not have to pay anymore.

The rents you stand to incrementally receive by buying the house are all the rents from the year 11 onwards. So, since you just received a yearly rent of \$20,000 and they are growing at a 5% growth rate, the Present Value of those rents is

$$\frac{20,000 * (1.05)^{11}}{0.1 - 0.05} \frac{1}{(1.1)^{10}} = 263,763.9$$

On top of that you will have the next ten lease payments. The present value of those payments is

$$1,000A_{10\%}^{10} = 6,144.6$$

So the present value of you are buying is 269,908.5 which is less than the price being asked. You should not buy.

Question 2

In the first part, you simply make the expected value and standard deviation of the combination of a risky asset and a risk free asset. The expected return will be

$$0.6 * 15\% + 0.4 * 6\% = 11.4\%$$

The standard deviation will be

$$0.6 * 30\% = 18\%$$

In the second part of the question there is a typo. The standard deviation of Advanced Medicals is 40% and not 35%

Determining the proportions of the two is made through the expected return of the portfolio. Since,

$$15\% = w * 20\% + (1 - w) * 5\%,$$

The weight of Advanced Medicals is 2/3 and Backward Industries 1/3. The dollar amount on each firm is that proportion times the money put in the whole portfolio. That amount is 60%*2million=1.2million. So, in Advanced Medicals you have 800,000 and in Backward Industries you have 400,000

For the Correlation coefficient we need to use the Variance of the Portfolio. So,

$$30 * 30 = \left(\frac{2}{3}\right)^2 40 * 40 + \left(\frac{1}{3}\right)^2 16 * 16 + 2 * \frac{1}{3} * \frac{2}{3} \rho * 40 * 16.$$

It follows that the correlation is 0.56

In the last part of the question, you just need to discover the weights needed to have a standard deviation of 25%. The weight is 5/6 for the stock portfolio. This means you need to invest 1.667 million in it. So, you require buying 0.467million of the stock portfolio and selling the same amount of Treasury Bills.

Question 3

In the first part you just need to calculate the WACC. The Equity value of the firm is 550 million (the price of the stock times the number of shares)

$$WACC = \frac{550}{750} * 12\% + \frac{200}{750} * 7\% * (1 - 0.35) = 10.013\%$$

In order to answer the second part, you must know what will be the cash flow when the firm pays no taxes and by what rate you should discount it. For the latter, we saw that when the firm pays no taxes the WACC becomes equal to the cost of equity when there is no debt.

Therefore we will use the MM Proposition II to find that number

$$12\% = R_0 + \frac{200}{550} (1 - 0.35)(R_0 - 7\%)$$

And the rate is 11.04%.

To get the cash flow, we just need to use the following relationship between before tax cash flow and after tax cash flow

$$\textit{Before Tax} * (1 - \textit{tax rate}) = \textit{After Tax}$$

We will start by the after tax Cash flow. The value of the firm is 750million. The discount rate is 10.013%. So,

$$750 = \frac{\textit{After tax Cash Flow}}{0.10013}$$

The after tax Cash Flow is 75.1 million. So, the Before Tax cash flow is 115.54 million.

So, the Value of the firm if it moves to Mikonos will be the present value of the Cash Flow discounted at 11.04%. So,

$$\frac{115.54}{0.1104} = 1,046.56$$

The value of Debt will be still 200 million but the value of equity will be 846.56 million. With 10 million shares, the price will be 84.66.

For the last part, you needed the value of the beta of the Assets or the information of the SML. Assume the Beta do Assets is 1.5. With this we can compare the beta of the equity in the two situations

$$\beta_{US} = 1.5 \left(1 + \frac{200}{550} (1 - 0.35) \right) = 1.85$$

$$\beta_{Greece} = 1.5 \left(1 + \frac{200}{846.56} \right) = 1.85$$

The equity will not become less risky. The systematic risk will not change.

Question 4

In this model you are supposed to use the APV method. The discount rate will be 12%. The complicated part in the question is to calculate the Tax Shield form Debt. The usual formula cannot be used because the Debt is not perpetual. On top of that is not a Bond, it is an Annuity.

So, the first step is to figure out the Annuity Payments

$$300,000 = CA_{8\%}^2$$

So, the payments will be 168,230 in the two years. The next step is to know how much of those are interest payments. In the first payment, the Debt is still 300,000. So, the interest is 8% of this, ie, 24,000. So, 144,230 of the Debt will be paid with the first payment. So, this means that for the second year you only owe 155,770. So, the interest of that is 12,460.

So, the PV of the project is

$$-1,000,000 + \frac{600,000}{1.12} + \frac{700,000}{(1.12)^2} + 0.30 * \left(\frac{24,000}{1.08} + \frac{12,460}{(1.08)^2} \right) = 103,621$$

Question 5

The answer to the first part is No. We saw in lecture that maximizing firm value and equity value is exactly the same. So, a project that has positive Net Present Value to the Equity part of the Firm will also have a positive Net Present Value to the firm as a whole.

To solve the question, you will need the cost of equity and the Levered Cash Flow. For the cost of equity you will use the MM Proposition II. You have the Capital Structure (Debt/Equity=1/5), the Cost of equity with no Debt (10%) and the cost of Debt (8%). So,

$$R_S = 10\% + \frac{1}{5}(1 - 0.35)(10\% - 8\%) = 10.26\%$$

The Levered Cash will be the after tax value of the Earnings Before interest and taxes minus the Interest payments. This value is 702,000.

So, the Present Value is

$$-20,000,000 + \frac{702,000}{0.1026} = -13,158,000$$