Problem Set 3

Financial Decision Making in a Business Context

1.Real Estate International - Agency Costs of Debt

Real Estate International is a firm whose only asset is a plot of vacant land and whose only liability is 18 million euros of debt (face value) due in one year. If left vacant, the land will be worth 10 million euros (for sure) in 1 year. Alternatively, the company may develop the land at an upfront cost of 16 million euros, in which case the developed land will be worth 35 million (for sure) in one year. The risk-free interest rate is 10% and there are no taxes.

a. If the firm chooses not to develop the land, what is the value of the equity today? And the value of the debt?
b. What is the NPV of developing the land?
c. Can the firm fund the 16 million cost of developing the land by raising new equity?
d. Can the firm fund the 16 million cost of developing the land by raising new one-year debt, junior to the existing debt (i.e., with an lower level of seniority)?
e. Can the firm fund the 16 million cost of developing the land by raising new one-year debt, *pari passu* with existing debt (i.e., with an equal level of seniority)? If your answer is positive, indicate what would be the face value of the new debt (due in one year); indicate as well what would happen to the market value of the existing debt.
f. Can the firm fund the 16 million cost of developing the land by raising new one-year debt, senior to existing debt?)? If your answer is positive, indicate what would be the face value of the new debt (due in one year); indicate as well what would happen to the market value of the existing debt.
g. If management act on behalf of the equityholders, do they have an incentive to develop the land by issuing *pari passu* debt? And what about senior debt?

2.SunBeam – Agency Costs of Debt

SunBeam is a technology startup which is choosing its research strategy. There are three possible strategies to choose from, each one producing a single cash payoff one year from today, according to the table below:

Strategy	Payoff	Probability
Strategy A	75 million euros	100%
Strategy B	140 million euros	50%
	0	50%
Strategy C	300 million euros	10%
	40 million euros	90%

Notes: ignores taxes and discounting

a. If the company is unlevered what research strategy should SunBeam choose? What is the value of the unlevered firm?

Suppose that the firm has 20 million of one-year debt (face value).

b. Which is the research strategy favored by stockholders? What is the strategy favored by debtholders?
c. If managers act on behalf of equityholders, what is the value of the value of the equity today? And the value of the debt today?

Rework your answers to questions b. and c. for the following alternative levels of debt:

- 40 million of one-year debt (face value);
- 110 million of one-year debt (face value).

d. Which of the three levels of debt considered generates higher financial distress costs?

3.Citron Corp – Debt Trap

Citron Corp has the following balance sheet in market value:

Unlevered assets	100	Debt	50
PV(Costs of financial distress)	-20	Equity	30

The firm's debt is due in 1 year and has a face value of 90. For simplicity, assume that there are no taxes in the economy and the risk-free rate is zero.

Financial distress is currently having a major negative impact on firm value. As the CEO, you would like to eliminate the PV(Costs of financial distress) to enhance the value of the firm. To achieve that goal you may either buy back the debt or capitalize the firm to lower the debt's credit risk. However, since you have been hired by the shareholders you will do whatever maximizes shareholder wealth
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1. Should you sell existing assets and extinguish the outstanding debt?
2. Should you raise new equity and extinguish the outstanding debt?
3. Should you raise new equity and keep the proceeds in the balance-sheet (NPV=0) as to make the outstanding debt default-free? Assume that with an extra 50 held in the balance sheet in marketable securities the outstanding debt becomes default free.
4. What is the only way to escape the debt trap?