THE OPTIONS TO EXPAND AND ABANDON: VALUATION IMPLICATIONS

Problem 1

a. Net present value of the project = $ 30 - $ 40 = - $ 10 million

b. Inputs

S = Present Value of Net Revenues =			$ 30 million
K = Cost of televising the Olympics =			$ 40 million
t = Time until Olympics =			2 years
r = Riskless rate =			5%
Variance in value =			0.09
y = Cost of delay =			0
d1=	-0.2302	N(d1) =	0.4090
d2 =	-0.6545	N(d2) =	0.2564

Value of the Rights = 30 (0.409) - 40 exp (-0.05)(2) (.2564) = 2.99

c. Probability that rights will be profitable = 0.2564 - 0.4090

Problem 2

a.

S = Expected reinvestment needs as percent of firm value = 10%

K = Reinvestment needs that can be met without excess debt capacity = 6%

T = 1 year

Standard deviation in reinvestment needs = 0.30

The option pricing value with these inputs is 4.32%. If we assume that the current excess returns (18% - 12%) continue in perpetuity, the value of flexibility is

Value of flexibility (on an annual basis) = 4.32% * .06/.12 = 2.16%

b.

Based upon part a, would you recommend that Skates use its excess debt capacity?

The value of flexibility exceeds what the firm would save by moving to its optimal (only 1%). The firm should not use its excess debt capacity.

Problem 3

Value of abandonment option

S = PV of cashflows from development = $ 900 million* 0.4 = $ 360 million

K = Abandonment value = $ 300 million

T = 5 years

Riskless rate = 5%

Standard deviation = 40%

Value of abandonment option = $ 63.51 million

The net present value of this project to Disney is -$ 40 million.

Net present value = -400 + 360 = -40 million

The value of the abandonment option is greater than the negative net present value. I would advice Disney to make the investment.

If you were the developer, you would need to make a net present value equal to at least $63.51 million to cover the cost of the abandonment option.

PV of cash flows to developer = (63.51) + .6 (1000) = $ 663.51 million

Problem 4

For the expansion potential to have option value, Quality Wireless has to have exclusive rights to expand.

Net present value of initial investment = - $ 200 million

S = PV of cashflows from expansion (currently) = ?

K = $2500 million

T = 5 years

Standard deviation in firm value = 25%

Riskless rate = 5%

Setting up the option value = $ 200 million and solving for S, we get

S = $ 1511 million

(Sorry. The only way to get there is by trial and error. An approximate answer would have been sufficient)

Problem 5

Net present value of initial investment = -750 + 85 (PV of annuity, 10 years, 12%)

= - $269.73 million

Value of expansion option

S = 150 (PV of annuity, 12%, 15 years) = $1,021.63 million

K = Cost of expansion = $ 2,000 million

Riskless rate = 6.5%

Standard deviation in value = 40%

Life of the option = 10 years

Value of expansion option = $ 477.28 million