What is the Value of a Railway Ticket (if black marketing is permitted)?

How is Valuation of a "Sick Company" done?

How do we decide on land value (price to pay)?

- Illustration: **Value a Firm with an unused asset i.e., Land (say, a sick company listed on the stock market – with no other assets worth talking about)**
- Land Price Rs 100 crores
- Outstanding Debt Rs 80 crores
- Life of the Option 10 years
- Standard Deviation 40%
- Riskless rate 10%
- Value of the call option 75.94

- **Illustration:** **Value a Firm with an unused asset i.e., Land (say, a sick company listed on the stock market – with no other assets worth talking about)**
- Land Price Rs 50 crores
- Outstanding Debt Rs 80 crores
- Life of the Option 10 years
- Standard Deviation 40%
- Riskless rate 10%
- Value of the call option 29.86

- **Illustration:** **Value a Firm with Land (say, a sick company listed on the stock market – with no other assets worth talking about)**
- **New Project by our Real Estate Company (Topic: Lenders Vs Equityholders)**
- Negative NPV Project … & also more Volatile
- Land Price Rs 98 crores
- Outstanding Debt Rs 80 crores
- Life of the Option 10 years
- Standard Deviation 50%
- Riskless rate 10%
- Value of the call option 77.03

How is Valuation of a "Power Sector Company" with 2-Phase done?

Traditional Approach to Valuation - Illustration

Green field project ~ ingredients

Initial Cash Invested

Project Cash Flows

say, a Green field power project

Year	0	1	2	3	4	5	6	7	8	9	10	11	Total
Invested	-1100	-200	-1300	-300	-100								-3000
Operations		100	200	300	350	350	350	350	350	350	350	350	
Terminal Value												4550	
FCF	-1100	-100	-1100	0	250	350	350	350	350	350	350	4900	
IRR	14.5%												
Land Value	3%	-90											

FIRM VALUE

- Present Value of Future Cash Flows from Existing Projects, *plus*
- *NPV of all future projects, plus*
  - In other words, if DHL announces a Rs 700 crores NPV project then its value should go up by that amount (i.e., share prices).
- *Plus*, Real Options in all the above projects

Managerial Real Options

Expand (or Contract)

- Allows the firm to expand (contract) production if conditions become favorable (unfavorable) - GACL

Abandon

- Allows the project to be terminated early - Enron

Postpone (timing option)

- Allows the firm to delay undertaking a project (reduces uncertainty via new information) - Power Producers

Example of Natural Resources Valuation

✓ONGC would bid based on …

✓ The timing option in an offshore project (oil exploration field - a) not to develop; b) develop the reserve immediately; and c) postpone development and thus extend exploration phase;

Valuing Natural Resource Options: Inputs

(a) Available reserves of the resource

(b) Estimated cost of developing the resource

(c) Time to expiration of the option

(d) Variance in value of the underlying asset

(e) Operating cash flow on underlying asset

(f) Periodical Leakages (if any)

- **Illustration: A Coal mine in Meghalaya**
- Estimated inventory of 1 million tonnes. | Capacity output rate: 50,000 tonnes per year | Price of coal is expected to grow 3% a year | Firm owns rights to this mine for 20 years | Cost of opening the mine is Rs 1 crore | Average production cost is Rs 250 per tonne | Production cost is expected to grow by 5% | Riskless interest rate 9% | Standard Deviation in Coal Price 16% | Current market price of coal Rs 375 per tonne
- Value of the underlying asset is Present value of expected coal sales Rs. 211 m
- Exercise Price is Cost of opening the mine + present value of the cost of producing coal Rs. 174 m
- Dividend yield is loss in production for each year of delay 5%
- Value of the coal mine as a call option Rs. 51.73 m
- If you use capital budgeting then value is Rs. 37.24 m

- **Illustration: A Oil Reserve in Krishna-Godavari Basin**
- Estimated Oil Reserve is 50 million barrels
- Present Value of the development cost $12 per barrel (with 2 years of development lag)
- Firm owns rights to exploit the reserve 20 years
- Cost (Marginal value) per barrel of oil is $12 per barrel
- Riskless rate 8%
- Standard Deviation in Oil Prices 9%
- Dividend yield 5%
- S $544 and X $600
- call option value $97 million

- **Illustration: Project to develop land for commercial purpose**
- Value of the underlying land Rs 500 crore
- Present value of cost of developing land Rs 400 crores
- Time to expire 25 years
- Standard Deviation of land prices 20%
- Riskless rate 7%
- Dividend Yield 4%
- Call value Rs 155 crores

Use of Real Options in this traditional Power Plant project for

(a) Pricing of land

(b) Stretching the payments and sharing the upside

(c) Acquiting of coal mines (in bidding)

(d) Limiting the downside by creating put options (such as, making two phases of the power plant project)

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