

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





How is Valuation of a "Sick Company" done?

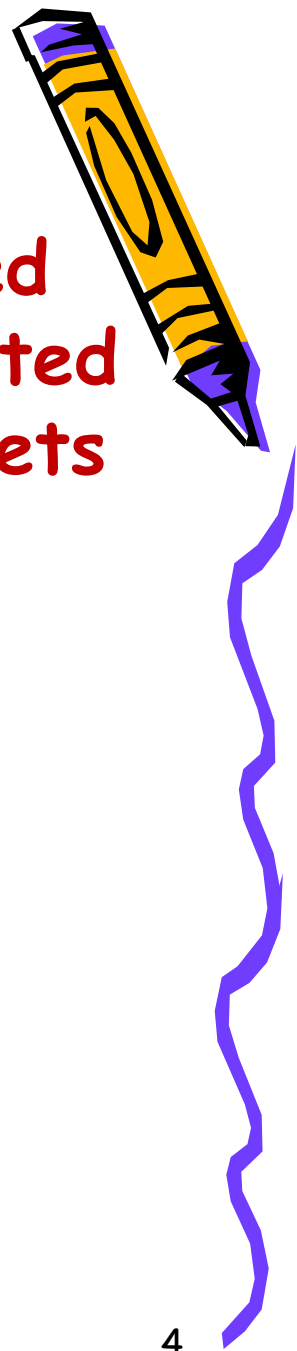


How do we decide on land value (price to pay)?

◆ 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

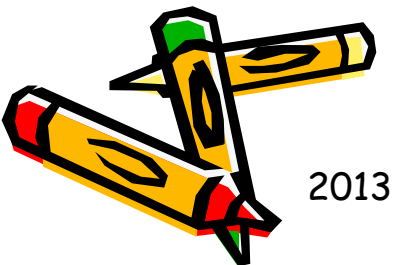
Initial Cash Invested

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											



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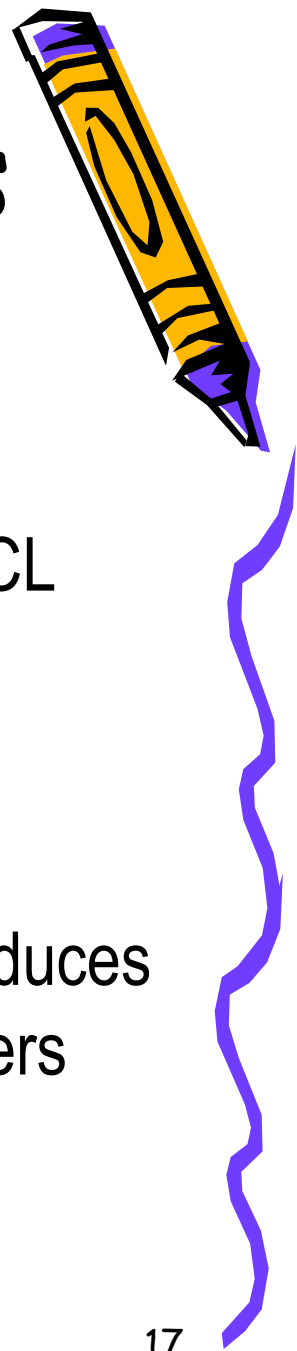


FIRM VALUE

- ◆ 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)

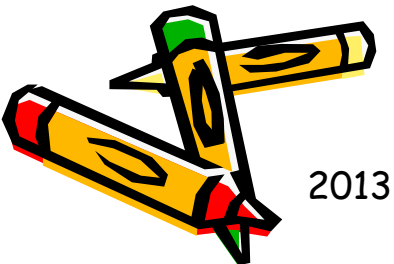
- Allows the firm to delay undertaking a project (reduces uncertainty via new information) - Power Producers



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;



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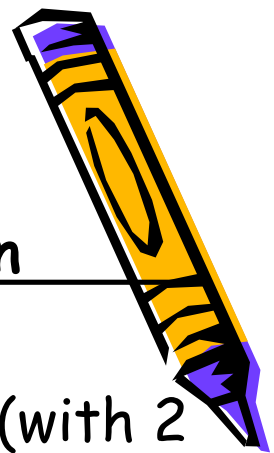
Valuing Natural Resource Options: Inputs

- (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

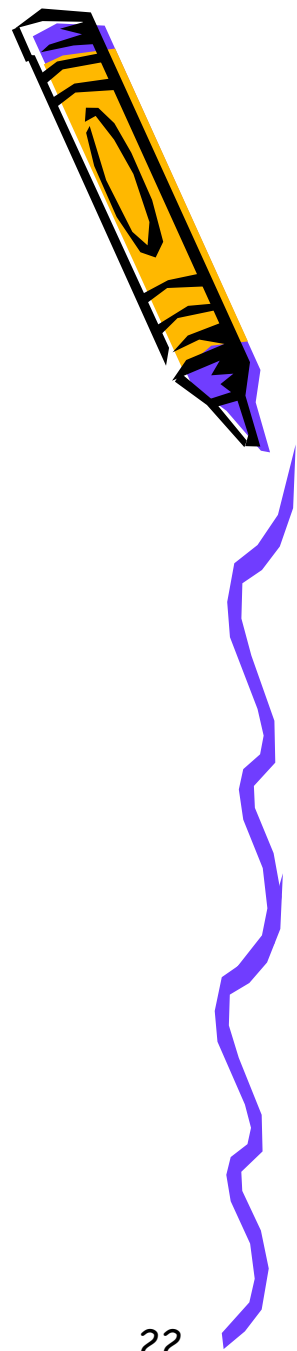
- ◆ Estimated inventory of 1 million tonnes. | Capacity output rate: 50,000 tonnes per year | Price of coal is expected to grow 3% a year | Firm owns rights to this mine for 20 years | Cost of opening the mine is Rs 1 crore | Average production cost is Rs 250 per tonne | Production cost is expected to 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

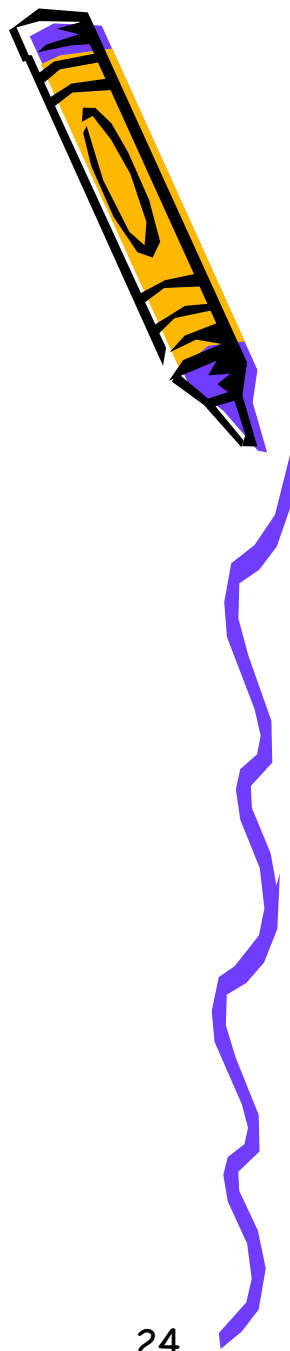
- (a) Pricing of land
- (b) Stretching the payments and sharing the upside
- (c) Acquiting of coal mines (in bidding)
- (d) Limiting the downside by creating put options (such as, making two phases of the power plant project)





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