

Chapter 8, Problem 5

Anti-Fossil Fuels: Rainbow Options

Input Data

Present value of future cash flows	\$250	million
Volatility1	20%	annual
Volatility2	30%	annual
Risk-free rate of return	5%	continuous
Time to expiration	2	years
Time step	1	year(s)
Strike price (Investment cost)	\$300	million

Results

NPV	-\$50
ROV	\$59
Value added	\$109

Calculated Parameters

Up factor (u_1)	1.221
Down factor (d_1)	0.819
Risk-neutral probability (p_1)	0.577
$1-p_1$	0.423
Up factor (u_2)	1.350
Down factor (d_2)	0.741
Risk-neutral probability (p_2)	0.510
$1-p_2$	0.490

Asset Valuation Lattice

Time period	0	1	2
Valuation of underlying asset			\$680
			\$373
			\$456
		\$412	\$250
			\$373
			\$205



			\$250
		\$226	\$137
	\$250		\$456
			\$250
			\$305
		\$276	\$168
			\$250
			\$137
			\$168
		\$152	\$92



Option Valuation Lattice

Time period	0	1	2
Valuation of option			\$380
			\$73
			\$156
		\$158	\$0
			\$73
			\$0
			\$0
		\$20	\$0
	\$59		\$156
			\$0
			\$5
		\$45	\$0
			\$0
			\$0
			\$0
		\$0	\$0

