

Chapter 7, Problem 7

VCR International: Option to Contract

Input Parameters

Present value of future cash flows	\$400	million
Volatility	30%	annual
Risk-free rate of return	5%	annual
Time to expiration	5	years
Contraction factor	0.25	
Time step	1	year(s)
Savings of contraction	\$200	million

Results

NPV	\$400
ROV	\$413
Value added	\$13

Calculated Parameters

Up factor (u)	1.350
Down factor (d)	0.741
Risk-neutral probability (p)	0.510

Asset Valuation Lattice

Time period	0	1	2	3	4	5
Valuation of underlying asset	\$400	\$540	\$729	\$984	\$1,328	\$1,793
		\$296	\$400	\$540	\$729	\$984
			\$220	\$296	\$400	\$540
				\$163	\$220	\$296
					\$120	\$163
						\$89

Option Valuation Lattice

Time period	0	1	2	3	4	5
Valuation of contraction option	\$413	\$544	\$729	\$984	\$1,328	\$1,793
		\$321	\$408	\$540	\$729	\$984
			\$264	\$313	\$400	\$540
				\$241	\$256	\$296
					\$230	\$241
						\$222

