

Chapter 7, Problem 4

NanoNano: Option to Abandon with a Barrier

Input Data

Present value of future cash flows	\$200	million
Volatility	45%	annual
Risk-free interest rate	5%	annual
Time to expiration	5	years
Salvage value	\$120	million
Barrier value	\$100	million
Time step	1	year(s)

Results

NPV	\$200
ROV	\$217
Value added	\$17

Calculated Parameters

Up factor (u)	1.568
Down factor (d)	0.638
Risk-neutral probability (p)	0.444

Asset Valuation Lattice

Time period	0	1	2	3	4	5
Valuation of underlying asset	\$200	\$314	\$492	\$771	\$1,210	\$1,898
		\$128	\$200	\$314	\$492	\$771
			\$81	\$128	\$200	\$314
				\$52	\$81	\$128
					\$33	\$52
						\$21

Option Valuation Lattice*

Time period	0	1	2	3	4	5
Valuation of abandonment option	\$217	\$319	\$492	\$771	\$1,210	\$1,898
		\$156	\$211	\$314	\$492	\$771
			\$126	\$148	\$200	\$314
				\$120	\$120	\$128
					\$120	\$120
						\$120

*Continue if green

Abandon if red

