QUESTION

Calculate the initial premium and the trading strategy for the asset/bond replicating portfolio for a European call option on the following data:

Strike \$50; Maturity 1 year, two intervals;
Continuously compounded annual risk-free rate 5%;
Volatility 25%; Current price \$50.

ANSWER

$k = 50$

$r = 0.05$

$$\left.\begin{array}{r} \sigma = 0.25 \\ s_0 = 50 \end{array}\right\} \text{main changes from question 2.}$$

$$U = e^{\left[\left(0.05-\frac{0.25^2}{2}\right)\times\frac{1}{2}+0.25\sqrt{\frac{1}{2}}\right]} = 1.20460$$

$$D = e^{\left[\left(0.05-\frac{0.25^2}{2}\right)-0.25\sqrt{\frac{1}{2}}\right]} = 0.84586$$

<u>Eurocall</u> Summary:

$C_0 = 5.818613$
$\phi_0 = 0.613431$
$\psi_0 = -24.8529$
$S_0 = 50$

$C_1^+ = 11.46474$
$\phi_1^+ = 1$
$\psi_1^+ = -48.7653$
$S_1^+ = 60.23$

$C_1^- = 0.461623$
$\phi_1^- = 0.062361$
$\psi_1^- = -2.1758$
$S_1^- = 42.293$

$C_2^+ = 22.55306$
$S_2^+ = 72.55306$

$C_2^0 = 0.946148$
$S_2^0 = 50.94615$

$C_2^- = 0$
$S_2^- = 35.77396$