$L = S_0 d^{m_0}$ $U = S_0 u^{n_0}$

$\tau = \min\{n \mid S_n \notin (L, U)\}$

$S_{n+1} \begin{cases} uS_n \\ dS_n = \frac{1}{u} S_n \end{cases}$ $L = S_0 u^{-m_0}$

$p \neq q$ $d = \frac{1}{u}$

Find "F" $F(S_{\tau \wedge n})$ is a martingale

$F(L) = 0$ $F(U) = 1$

$$\boxed{f(s) = p f(u \cdot s) + q f(d \cdot s)}$$

$S_{\tau \wedge n}(w) \in \{u^{-m_0} S_0, u^{-m_0+1} S_0, \dots, u^{n_0} S_0\}$

$L = S_0 d^{m_0} \quad U = S_0 u^{n_0}$

$\tau = \min\{ n \mid S_n \notin (L, U) \}$

$F(S_0 u^{n_0}) = 1$

$F(S_0 u^{n_0 - 1}) = p F(S_0 u^{n_0}) + q F(S_0 u^{n_0 - 2}) = A + B(S_0)^\alpha [p u^{n_0 \alpha} + q u^{(n_0 - 2)\alpha}]$

$F(S_0 u^{n_0 - 2}) = p F(S_0 u^{n_0 - 1}) + q F(S_0 u^{n_0 - 3})$

$\vdots$

$F(S_0 u^{-m_0 + 1}) = p F(S_0 u^{-m_0 + 2}) + q \cdot 0$

$\boxed{f(s) = p f(u \cdot s) + q \, f(d \cdot s)}$

$F(S_0 u^{-m_0}) = 0$

$f(x) = A + B x^\alpha$

$S_{\tau \wedge n}(\omega) \in \{ u^{-m_0} S_0, u^{-m_0 + 1} S_0 \ldots, u^{n_0} S_0 \}$

$0 = F(S_0 u^{-m_0}) = \underline{A} + \underline{B} (S_0 u^{-m_0})^{\underline{\alpha}}$

$r \in \{-m_0+1, \dots, n_0-1\}$

$$A + BS_0^\alpha u^{r\alpha} = f(S_0 u^r) = A + \beta S_0^\alpha [p u^{(r+1)\alpha} + q u^{(r-1)\alpha}]$$

$$\frac{u^{ra} = p u^{(r+1)a} + q u^{(r-1)a}}{u^{(r-1)\alpha}}$$

$=$

$f(y) = A + B y^\alpha$

$$u^\alpha = p u^{2\alpha} + q$$

$$px^2 - x + q = 0$$

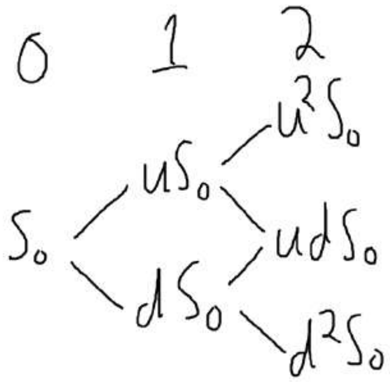
$u^a = X$

$$x = \frac{1 \pm \sqrt{\boxed{1-4pq}}}{2p} \quad {>0}$$

$$x = px^2 + q$$

u^α

$N=2$



$$S_2(H,T) = S_2(T,H)$$

$$V_2(H,T) \neq V_2(T,H)$$