Rate Relationships

Spot Rate S_n – Interest Rate of an n-year zero-coupon bond

One-Year Forward Rate f_{n-1} – interest rate (implied by spot rates) for extending a loan from $t=n-1$ to $t=n$.

Zero Coupon n-Year Bond Price $P(0,n)$ – price today of a zero-coupon bond maturing at 1 exactly n years from today.

Relationships:

$$S_1 \equiv f_0 \qquad P(0,1) = \frac{1}{(1+S_1)}$$

$$(1+S_{n-1})^{n-1}(1+f_{n-1}) = (1+S_n)^n$$

$$(1+S_n)^n = (1+f_0)(1+f_1)\cdots(1+f_{n-1})$$

$$P(0,n) = \frac{1}{(1+S_n)^n}$$

$$(1+f_{n-1}) = \frac{P(0,n-1)}{P(0,n)}$$