

Exchange Option pricing model (Margrabe)

created by Thijs van den Berg

$$C = S_1 e^{(Y_1 - r)t} N(d_1) - S_2 e^{(Y_2 - r)t} N(d_2)$$

$$d_1 = \frac{\ln S_1 / S_2 + (Y_1 - Y_2 + \frac{1}{2}\sigma^2)t}{\sigma\sqrt{t}}$$

$$d_2 = d_1 - \sigma\sqrt{t}$$

$$\sigma = \sqrt{\sigma_1^2 + \sigma_2^2 - 2\rho\sigma_1\sigma_2}$$

This option pricing model is known as the Margrabe model for exchange options. The exchange option allows the holder to exchange one asset for another at expiration.

Symbol list:

- C Price of the exchange option
- S_1 The value of the first underlying. This is the underlying to which you can exchange.
- S_2 The current underlying, this underlying can be exchanged into the other.
- Y_1, Y_2 Yields of the underlyings.
- σ_1, σ_2 Volatilities of the two underlyings.
- ρ Correlation between the two underlyings.
- t Time till expiration.