



Equity Warrant Definition and Pricing Guide



FinPricing



Equity Warrant

Summary

- Equity Warrant Introduction
- The Use of Equity Warrants
- Equity Warrant Payoffs
- Valuation
- Valuation Model Assumption
- A Real World Example



Equity Warrant

Equity Warrant Introduction

- An equity warrant gives the holder the right to purchase shares at a fixed price from a firm. It is an option on the common stock of a firm issued by the same firm.
- Warrants are in many ways similar to call options, but a few key differences distinguish them.
- Warrants tend to have longer durations than do exchange-traded call options.
- They are traded over the counter more often than on an exchange.
- Investors cannot write warrants like they can options.
- Warrants do not pay dividends or come with voting rights.
- When warrants are exercised, the company typically issues new shares at the exercise price to fill the order, resulting dilution of the share value.



Equity Warrant

The Use of Equity Warrants

- Investors are attracted to warrants as a means of leveraging their positions in a security.
- Warrants provide investors a way to hedge risk or speculate. They can also be used to exploiting arbitrage opportunities.
- Warrants are frequently attached to bonds or preferred stock as a sweetener, which can be used to enhance the yield of the bond and make them more attractive to potential buyers.
- Most commonly issued warrants are often detachable, meaning that they can be separated from the bond and sold on the secondary market.
- Wedded warrants are not detachable. The investor must surrender the bond or preferred stock in order to exercise it.
- Naked Warrants are issued on their own.



Equity Warrant

Warrant Payoff

- If there were n shares outstanding and m warrants exercised, the dilution factor corresponding to the percentage of the firm value that is represented by the warrants is given by

$$\alpha = m / (m + n)$$

- The payoff of the warrant at T is given by

$$payoff = \frac{m}{m + n} \max(A - K, 0)$$

where

$A = V/m$ the asset price

V the firm value



Equity Warrant

Warrant Valuation

- Warrants can be valued by the Black-Scholes model, but some modifications must be made to the parameters.
- The price of a warrant under the diluted Black-Scholes model is given by

$$W = \frac{m}{m+n} (Ae^{-qT} \Phi(d_1) - Ke^{-rT} \Phi(d_2))$$

where

$$d_{1,2} = \frac{\ln\left(\frac{A}{K}\right) + (r - q \pm 0.5\sigma T)}{\sigma\sqrt{T}}$$

r the interest rate

q the dividend yield



Equity Warrant

Warrant Valuation (Cont)

- Strictly speaking, A is the asset price of the firm and σ is the volatility of the firm (not stock). Both of them are not observable.
- For simplicity, people may use stock price and stock volatility to replace the firm value A and the firm volatility σ above, although this simplification generally underestimates the warrant's price.



Equity Warrant

Valuation Model Assumption

- There are several assumptions in this simplified warrant mode.
- The price process of the stock follows a geometric Brownian motions.
- The stock provides a continuous dividend
- The risk-free interest rate is deterministic.
- The volatility is constant.
- The asset value per share is equal to the stock price.
- The volatility of the firm is equal to the volatility of the stock.



Equity Warrant

A Real World Example

| | |
|--------------------|-----------|
| Outstanding Shares | 109254024 |
| Underlying equity | BTX.A |
| Currency | USD |
| Strike | 4.55 |
| Maturity Date | 10/1/2018 |
| CallPut | Call |
| Exercise Type | European |
| Settlement Type | Physical |
| Position | 2038 |



Thank You

Reference:

<https://finpricing.com/lib/FiBond.html>