Queens College, CUNY, Department of Computer Science

**Computational Finance**

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Instructor: Dr. Sateesh Mane



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# 11 Lecture 11

## Warrants

- Up to now we has assumed that all options are traded on exchanges, or else they are private deals (OTC = over the counter).
- There is another important class of options on stocks, called **warrants.**
- Warrants are **call options written by a company on its own stock.**

### 11.1 Warrants

- **Warrants** are call options written by a company on its own stock.
- Many respected experts use the term "warrant" synonymously with a call option.
- When warrants are exercised, the company issues **new shares** to deliver to the warrant holders. Hence warrants are a way for a company to issue new shares of stock to investors.
- Note that the issue of the new shares **dilutes the equity** of the existing shareholders.
  1. This means that after the new shares are issued, the existing shareholders will own a *smaller fraction of the shares of the company.*
  2. For example, if a company has 100 million shares and issues warrants for 10 million new shares, then after the new shares are issued, the existing shareholders will own a fraction $100/110 \simeq 90.91\%$ of the new total shares of the company.
- Unlike exchange traded options, the number of warrants is fixed, by the number of new shares the company plans to issue.
- Warrants can have non-standard expirations and strikes, i.e. expiration dates and strike prices which are not equal to those listed on the options exchanges.
- Exchange-listed options typically have expirations of one year or less.
- The expiration terms of warrants can be much longer, possibly several years.
- Obviously warrants are backed up by the company itself and *not* by an options exchange or clearing house.
- Warrants are valued using the same option pricing formulas that are employed for exchange-listed options.
- Warrants are simply a particular type of call options.

## 11.2 Puts

- Warrants are always call options.
- Investors can buy new shares of the company.
- What about the issue of *put options* by a company on its own stock?
- The issue of put options by a company on its own stock is forbidden by law.
- Put options become more valuable as the stock price decreases. Hence put options written by a company on its own stock leads to an unstable situation where it is profitable for the company to drive *down* the price of its own stock.
- In rare circumstances companies can obtain legal permission for a limited issue of puts on their own shares.
  This is rare but not impossible.
- In that respect, one cannot formulate put-call parity for warrants, because the required puts do not exist.

## 11.3 Exchangeables

- Can a company write call options on the shares of ***another company?***
- Yes, this is not forbidden by law.
- If company A is planning to take over company B, company A can write call options on the ahares of company B.
- For example if company A needs extra money to expedite the takeover process, company A might issued **exchangeables**, which allow allows investors to acquire ownership of shares of company B.