



LISBON  
SCHOOL OF  
ECONOMICS &  
MANAGEMENT  
UNIVERSIDADE DE LISBOA

## Corporate Investment Appraisal

Masters in Finance

2017-2018

Fall Semester

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Problem Set 9:

Valuation of Warrants, Rights and Convertible Bonds

TO SOLVE IN CLASS

1. Company MS currently has 1 million shares outstanding, with a market capitalization of \$40 million. The company announces an issue of 1 million warrants at \$5 each. Each warrant gives its holder the right to buy 1 new share at a price of \$30 within the next 5 years. The company promises not to distribute dividends during this period. The volatility of the equity rate of return is 20% per year. The annual risk-free interest rate (continuous compounding) is 8%.
  - a. What is the market value of each warrant?
  - b. What is the share price immediately after the warrants issue?
  - c. Considering that the capital to raise is to be invested in a “zero NPV” project, what would be the fair price for the warrants at the time of their issuance?
  
2. Firm S is 100% equity financed and has 1 million shares outstanding, listed in the Stock exchange. The firm decides to raise new equity of €100 million via a rights issue. Firm S’s stock price immediately before the rights issue announcement is €100. The rights issue is structured under the following terms: (i) each current share is entitled to 1 right which can be converted into a fixed number of new shares at the end of 2 months, for a price of €50 per share. The offering is underwritten by an investment bank, Kappa, which charges an upfront fee of €10 million for the firm commitment option. Firm S will not pay dividends in the next two months. The annual volatility of the rate return of its assets is 40%.The riskless interest rate (continuous compounding) is 10% per annum.
  - a. Into how many shares is each right convertible?
  - b. At the time of the rights issue at what price will they be traded?
  - c. What is the share price after the rights issue?
  - d. How do you value the investment bank’s firm commitment fee?

3. Estimate the value of the following issue of convertible bonds of company AER, knowing that:

- The company is all-equity financed;
- It announces an issue of (european) convertible bonds, zero coupon, with a 5 year maturity, placed at nominal value;
- The face value is \$1,000 per bond;
- The number of bonds to issue is 150,000;
- The conversion price of these bonds is \$50 per share;
- AER currently has 50 million shares outstanding, which trade in the stock exchange;
- AER's stock price, immediately before the announcement of the convertibles issue, is \$35;
- The annualized volatility forecasted for AER's assets, after the bonds issue, is 30%;
- The risk-free interest rate (continuous, for 1 year) is 6.5%;
- The yield in a "standard" bond – without the feature of conversion – for a company in the same risk class would be 10%.