Corporate Investment Appraisal

Masters in Finance

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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%.