TUTORIAL ASSESSMENT TASK 2 – VALUATION OF A CORPORATE BOND ISSUE BY QBE INSURANCE GROUP LIMITED

On April 2nd 2010, QBE Insurance Group Limited completed an issue of non-zero coupon bonds to raise $500 million to fund the acquisition of a number of general insurance businesses in the United States. Each of the bonds issued had a $1,000 par value, a fixed 5.60% per annum (bond equivalent) coupon rate with coupon interest paid quarterly, and a 10-year maturity term. On the date of issue of these corporate bonds, a 6.00% per annum (bond equivalent) yield was demanded by investors in the market to purchase the QBE Insurance Group Limited bonds.

1) Based on the above information, determine the market price of one bond on the issue date. (3 marks)

Relevant valuation information:
- Number of quarterly periods (N) = 10 years × 4 = 40 periods
- Quarterly yield (I/Y) = 6.00% / 4 = 1.50%
- Quarterly coupon interest payment (PMT) = ($1,000 × 0.056) / 4 = $14.00
- Par value (FV) = $1,000

The value of one bond on the issue date can be determined as:

$$B_0 = \$14.00\left[\frac{1-1/(1.0150)^{40}}{0.0150}\right] + \frac{\$1,000}{(1.0150)^{40}} = \$418.8218 + \$551.2623 = \$970.0841$$

Exact value calculated using the Texas Instruments BAII Plus calculator = $970.0842

2) Explain whether the quarterly payments from the bonds would be higher or lower if they had an amortising par value payment structure (similar to a mortgage security) rather than the bullet maturity repayment structure that was employed with the bonds. (2 marks)

The quarterly payments would be higher under an amortising payment structure as they would include interest payments as well as a principal repayment component, as the amortising payment structure involves repayment of the par value over the life of the security. This can also be shown mathematically by calculating the required quarterly amortising payment:

$$Payment = \$1,000 \Big/ \left[\frac{1-1/(1.0150)^{40}}{0.0150}\right] = \$33.4271$$

3) On April 2nd 2012 (two years after the initial issue date), QBE Insurance Group Limited released an announcement to the market indicating that future company insurance margins and resulting profitability will be lower due to a greater expected frequency of natural disasters. If this news resulted in the market's required return on the QBE Insurance Group Limited bonds increasing to 6.40% per annum, what should the traded price of the bonds have been in the market on April 2nd 2012? (3 marks)

The required changes to the valuation are:
- Number of quarterly periods (N) = 8 years × 4 = 32 periods
- Quarterly yield (I/Y) = 6.40% / 4 = 1.60%

The price of the bond in the market on April 2nd 2012 should be:

$$B_0 = \$14.00\left[\frac{1-1/(1.0160)^{32}}{0.0160}\right] + \frac{\$1,000}{(1.0160)^{32}} = \$348.4867 + \$601.7296 = \$950.2163$$

Exact value calculated using the Texas Instruments BAII Plus calculator = $950.2162

4) Due to the short-term nature of the potential payouts associated with the insurance policies generally issued by QBE Insurance Group Limited, the company is a major investor in US Treasury securities. As a result, the bonds issued by QBE Insurance Group Limited have a coupon payment termination clause, whereby the corporate bonds will cease paying interest for the remaining maturity period if the 10-year US Treasury bond yield decreases below 2.00% per annum on any individual day. If the wider implications of the announcement described in part 3) led to a surge in demand for US Treasury securities due to their 'low-risk status' which lowered the 10-year US Treasury bond yield to 1.90% per annum and triggered this coupon payment termination clause on April 2nd 2012, what price would you have been prepared to pay to purchase the QBE Insurance Group Limited bonds on this date if your required return was 6.20% per annum? (2 marks)

Relevant information:
- Number of quarterly periods (N) = 32 periods
- Quarterly yield (I/Y) = 6.20% / 4 = 1.55%
- Quarterly coupon interest payment (PMT) = $0.00
- Par value (FV) = $1,000

$$B_0 = \frac{\$1,000}{(1.0155)^{32}} = \$611.2830$$

Exact value calculated using the Texas Instruments BAII Plus calculator = $611.2830