



THE ANGLO PLATINUM PREFERENCES SHARES MODELLED AS CONVERTIBLE BONDS

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Convertible bonds can be thought of as normal corporate bonds with embedded options, which enable the holder to exchange the bond asset for the issuer's stock.

A recent issue in the South African market has been the preference shares of Anglo Platinum [1]. These are denoted as preference shares, but nevertheless can be modelled as convertible bonds.

The preference shares receive a dividend every six months at a rate of 6.38% per annum for every dividend period from 31 May 2004 to 31 May 2009. This is actually a coupon on the equivalent convertible bond. However, because they are deemed to be dividends on preference shares, they will be subject to a different tax treatment than bond coupons. Note that when in general valuing bond coupons the valuation is performed on the pre-tax amount under the implicit assumption that tax is still to be deducted. In this case, if we assume that tax is not to be deducted, then the dividends should be grossed up for tax so that 'in model' tax is deducted. For example, if we assume a 30% tax rate then the

dividends should be adjusted to 9.114% so that after a principled tax deduction they are restored to a rate of 6.38%.

The value of the preference shares will be highly dependent on the tax treatment they receive, which may differ on a case by case basis, and may be subject to legal risk with possible changes in South African tax law.

The preference shares are convertible into ordinary shares, at the election of the holder, for a five-year period from 31 May 2004 to the day prior to the so-called final conversion date 31 May 2009. The conversion ratio is determined as a function of the four-day volume weighted average price per ordinary share up to and including the business day prior to Friday, 21 May 2004. As of writing this value is not known, until such time as it is known, one can use an appropriate average forward share value in place of this average.

Until 21 May 2004 the pricing of the bond is subject to a material risk that the realised average spot price may be materially different to the current forward estimate.

There are no puts, and no calls, either soft or hard, until 31 May 2009. After that date, the holder loses all conversion rights, and the preference shares become callable corporate bonds. The bonds can be called on any coupon date (semi-annually as before) at par. The coupons are no longer fixed, they are floating, at 72.5% of the prime rate per annum. Last, but not least, the bond is a perpetual bond.

We can model the prime rate as a function of the JIBAR rate and hence as a function of the yield curve using a co-integration technique discussed in [2]. Such models have a very high R^2 regression coefficient (93% in the cited reference) and satisfy the requisite hypothesis tests on the residuals such as the Durbin-Watson test for using a co-integration equation. Thus, we have a callable perpetual corporate bond with a modelled floating coupon rate, and we can price this by using, for example, the Ho-Lee interest rate model [3].

We use 31 May 2009 as the termination date in the convertible bond model, and use the above price as the terminal redemption value. Thus, our model for

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valuing the Anglo Platinum preference shares proceeds in two steps: we value as of 31 May 2009 the callable corporate bond, using applicable forward rates and volatilities. We then use that value/date as the terminal redemption value/date in the convertible bond model.

REFERENCES

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