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Setting the optimal make-whole call premium

Eric A. Powers & Sudipto Sarkar

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Abstract

With a make-whole call, the call price is calculated as the maximum of the par value and the present value of the bond's remaining payments discounted at the prevailing risk-free rate plus a pre-specified spread known as the make-whole premium. The commonly accepted thumb rule in the investment banking community is to set the make-whole premium at 15% of the at-issue credit spread. Using a standard structural model, we calculate the optimal make-whole call premium, i.e. the make-whole premium that maximizes the ex-ante firm value subject to managers following a second-best call policy that maximizes the ex-post equity value. For reasonable parameterizations, optimal make-whole premiums are relatively close to 15% of the model-generated credit spread. Thus, the 15% thumb rule provides surprisingly good guidance for setting make-whole call premiums.

Keywords:

call provision make-whole structural model fixed income

JEL Classification::

G13 G12 G10

Notes

[1] The risk-free rate component is referred to as the Adjusted Treasury Rate. For bonds issued in the US, it is set in one of two ways. Either it is the yield-to-maturity (based on an average of primary dealer quote prices) for the closest maturity US Treasury, or it is a linearly interpolated value based on surrounding maturity Constant Maturity Treasury yields as published in the Federal Reserve's weekly statistical H.15 release. The bond's indenture will specify which method will be used.

[2] Our emphasis is exclusively on publicly issued, US dollar denominated corporate debt. This style of call provision with a floating call price, however, is also prevalent elsewhere. The call provision first seems to have been employed in privately issued debt in the early 1980s (Kahan and Tuckman, 1993; Kwan and Carleton, 1995). Make-whole call provisions have been present (under the name 'Canada Call' or 'Doomsday Call') in publicly issued Canadian corporate bonds since 1987 (Kaplan, 1998; Jacoby and Stangeland, 2004). The first publicly issued US corporate bond that we can identify with a make-whole call provision is the one issued by Harvard University in 1992.

[3] Setting the call price schedule of a fixed-price call provision is also highly influenced by a thumb rule. As noted by Fischer et al.(1989), the first call price of a fixed-price callable bond is typically equal to the issue price plus the annual coupon payment. Subsequent call prices step down to par value in a linear fashion. There is some variability in the length of initial call protection as well as the speed at which the call price steps down to par.

[4] Powers and Tsyplakov (2008) provide a model for valuing make-whole call provisions. However, they treat the make-whole call premium as exogenous. Mann and Powers (2004) identify factors that seem to influence make-whole premiums, but provide no guidance on how to optimally set them.

[5] These screens also identify 3678 noncallable bonds and 4885 bonds with fixed price call provision. There are also 1435 hybrid bonds with make-whole call provisions for the first one-third or one-half of the bond's life and fixed-price call provisions for the remaining life. The make-whole call provision for these hybrids seems to be an alternative method of reducing refunding risk for investors. Finally, there are 726 bonds with make-whole call provisions that are either initially call-protected or where the call provision expires at least one coupon period prior to bond maturity. Many callable-convertible bonds are now make-whole callable-convertible.

[6] We replace as missing 16 yield-to-maturity observations that appear to be improperly entered and which are more than 10% away from the value given by the yield approximation formula of Henderson (1907). In calculating credit spreads, we use a linear interpolation whenever the maturity period of the bond is in between the available CMT maturities.

[7] Sarkar (2001) uses a similar model to calculate the optimal call price for a bond with a fixed-price call provision.

[8] In general, a fixed-price callable bond will be called and replaced when the yield on new debt is low enough. This can happen if risk-free interest rates have fallen and/or the firm's default risk has fallen. Therefore, it might seem necessary to include both the interest rate risk (i.e. stochastic interest rates) and default risk in our model. Because of the manner in which a make-whole call price floats, however, it is clear that calls will not occur just because risk-free interest rates fall (Jacoby and Stangeland, 2004). Hence, the interest rate risk is effectively irrelevant and assuming a constant risk-free interest rate is appropriate for our analysis.

[9] This is a common assumption in the corporate bond literature, e.g. Fischer et al. (1989), Mauer (1993), Leland (1994), etc. With long-maturity bonds, the return of principle has a negligible value and can be ignored (Leland, 1994). Analytically, infinite maturity permits time-independent valuation formulas and optimal policies, which keeps the analysis tractable. Given infinite maturity, the sole purpose of F is to translate the coupon rate c into a dollar denominated cash flow.

[10] We assume there are no time consistency complications associated with the default trigger. In both the first-best and second-best scenarios, we assume that the default trigger V_D is driven by limited liability – managers default when equity value is zero. Note, however, that the default trigger depends on the coupon rate of the bond, which

in turn depends on the call trigger. Thus, the actual default trigger values in the first-best and second-best scenarios can be different.

[11] We know that the payoff to equityholders (new proceeds – call price + tax benefit – floatation costs) when the call option is exercised must be positive. However, we cannot rule out the possibility that parameters exist where the second best call policy would result in a wealth transfer from equityholders to bondholders (i.e. new proceeds – call price<0). This is possible if the net inflows from outsiders are large enough.

[12] Expected bankruptcy cost is indirectly affected by changes in p due to the effect on coupon rate of the par bond. This, however, is a secondary effect.

[13] The tax benefit and floatation cost associated with recapitalization are the fourth and fifth terms in Equation 19 – they are $\tau F(c/(r+p)-1)$ and $(1-\tau)\beta D_N V_C$, respectively. The tax benefit decreases with p but does not depend on V_C. Because V_C is negatively related to p, however, floatation cost is also negatively related to p. When p is small, V_C is very sensitive to p. For example, in our base case, for p = 0, 0.02% and 0.04%, V_C = 2313.9, 1863.9 and 1575.8. V_C, however, is much less sensitive to variation in p when p is larger. For example, when p = 0.26%, 0.28% and 0.30%, V_C = 663.2, 634.6, 608.8. Thus, for reasonable parameter values, floatation cost declines more rapidly than tax benefit when p is small, while the relationship is reversed when p is larger.

[14] When estimating σ, we set x to the weighted average maturity of the issuing firm's publicly traded debt.

[15] There were significant changes in personal tax rates in the United States during the time period of our sample. The top personal income tax rate was 39.6% from 1993 to 2000, 39.1% for 2001, 38.6% for 2002 and 35% since 2003. The top long-term capital gains tax rate was 28% from 1993 to 1996, 20% from 1997 to 2002 and 15% since 2003. Prior to 2003, dividends were taxed as personal income. However, subsequent to the Jobs and Growth Tax Relief and Reconciliation Act of 2003 (JGTRAA), dividends are taxed at the same rate as capital gains. While corporations expend significant resources lobbying for tax breaks, the top marginal tax rate for corporations has remained constant at 35%.

[16] The value of g = 0.25 used by Graham (2000) can ultimately be traced back to Bailey (1969). Due to data limitations, Bailey was forced to estimate g using aggregate data on recognized capital gains and estimated capital appreciation. Ikovic et al. (2005),

however, are able to use much more detailed individual investment account data (the same discount brokerage data originally used by Odean (1998) and subsequently used by many other researchers).

[17] The unique behaviour of the optimal make-whole premium to credit spread ratio as the tax rate parameter is varied is an artifact of our modelling assumptions for V. When τ is increased, the unlevered firm value V remains constant rather than decreasing (as it would in the real world) due to the increased tax burden. Levered firm value, however, increases due to the increase in tax shield benefits. Thus, the leverage ratio falls and credit spread decreases accordingly. The higher tax rate makes calling the bond more attractive because of the bigger tax write-off generated by the call premium. When these two effects are combined together, they explain why the optimal make-whole premium and credit spread are negatively correlated as tax rate is varied. Given the artificial nature of this particular relationship, limited attention should be given to it.

[18] Because the refunding cost β does not affect default risk directly, credit spread is relatively insensitive to variation in β. This partly explains why the ratio of make-whole premium to credit spread varies significantly more if β is varied than if any other parameter is varied. In addition, the range of β values displayed in the exhibit is wide compared to the range of the other parameters – the largest β value is three times the smallest β value.

[19] The Rent Way note was called in November 2006 when Rent-A-Center bought out Rent Way. The calculated call price was 117.351. The note, however, was trading between 103 and 105 prior to rumors of the takeover. The note was loaded with restrictive covenants. Presumably, this is what motivated Rent-A-Center to pay such a substantial premium (Brown and Powers (2012) for a detailed analysis of early retirements of make-whole callable bonds.)