Asset Backed Senior Note Valuation

We consider a securitization deal, which allows the holder to purchase co-ownership interests in a revolving pool of credit card receivables. To fund the acquisition of the interests in the revolving pool, the trust issued Asset-Backed Notes, in a number of different series. A share of future collections of credit charge receivables, to which the trust is entitled, is used to pay the interest and the principal of the notes.

At this time the deal has entered its liquidation period, during which all allocable collections remaining after the payment of interest are used to repay the principal. For this reason, only the portion of the model relevant to the liquidation period

The valuation is updated from time to time to account for changes in certain parameters, most notably the liquidation (prepayment) rate and the pool balance.

Some spot checks were performed on certain formulae (notably the discount factors) and sensitivity to certain parameters was examined by observing the results of the computations as the input parameters varied.

The valuation makes the assumption that the future values of these parameters will be unchanged until the final payment date. Subsequently, the calculator performs a deterministic computation consisting of calculating the future cashflows in the waterfall and discounting them.

The following notation will be used throughout the text: the contents of the cell in row i of column A in the spreadsheet will be denoted by A(i), and similarly for other columns. Lower-case letters will be used for all other constants.

The price p of equation (3) is the sum of monthly discounted cashflows, each cashflow consisting of the principal payment, AG, and the interest payment, AF - see equation (4). The discount factors are computed on the assumption of a flat interest rate term structure. Given the yield value entered by the user, the monthly compounded yield-to-maturity (YTM) is computed according to the formula

$$y_m = \left(1 + \frac{y}{2}\right)^{1/6} - 1. \qquad (1)$$

You can find more details on yield calculation at https://finpricing.com/lib/FiZeroBond.html

The discount factors are determined according to

$$d_i = \frac{(1 + y_m)^{i-1}}{(1 + y_m)^{t_1}} \qquad (2)$$

where i is the index of the cashflow, and t1 is the term to the first cashflow, equal to the fraction whose numerator is the actual number of days between the first cashflow date and the settlement date, and whose denominator is the actual number of days in the month of the settlement date.

We first focus on the principal payment, which is the pro-rated entire senior principal payment Z. This last amount is the allocated collection amount U, less the aggregate (senior and subordinate) interest V.

Both the aggregate interest and the allocated collection amount depend on the remaining aggregate (senior and subordinated) principal X. Each month during the liquidation period the aggregate principal is reduced by the senior principal payment Z, unless it falls below a certain

amount, which will trigger the cleanup prepurchase option, so that the entire remaining principal is paid off immediately (not shown in the formulae for simplicity).

The aggregate interest applies the weighted coupon rate to the aggregate principal, while the interest payment AF applies the senior coupon rate to the (pro-rata) remaining senior principal. The formulas guarantee that the principal payment never exceeds the remaining principal.

The remaining pro-rata senior principal AF and the remaining senior principal AA are reduced each month by the corresponding principal payments. The formula defines the collections allocated. The collections consist of the principal portion and the interest portion.

Comparing the factor T with the terms of the offering memorandum, one observes that the term 1.0535as/m reflects the enhancement amount of 5.35%, which is the basic enhancement amount as described in the offering memorandum. The formulae described are generally in agreement with the terms defined in the offering memorandum, however, the adjustments of the basic enhancement percentage described in the memorandum does not appear in the formula.

$$p = \sum_i \mathbf{AH}(i) d_i \ \text{(price)} \tag{3}$$

$$\mathbf{AH}(i) = \mathbf{AF}(i) + \mathbf{AG}(i) \ \text{(pro-rata cashflow)} \tag{4}$$

$$\mathbf{AF}(i) = y_s \mathbf{AI}(i-1)(\mathbf{M}(i) - \mathbf{M}(i-1))/365 \ \text{(pro-rata interest payment)} \tag{5}$$

$$\mathbf{AI}(i) = \mathbf{AI}(i-1) - \mathbf{AG}(i), \ \mathbf{AI}(1) = v\rho_s \ \text{(pro-rata remaining senior principal)} \tag{6}$$

$$\mathbf{AG}(i) = \min\left\{\mathbf{AI}(i-1), \mathbf{Z}(i)\frac{v}{a_s}\right\}, \ \mathbf{AG}(1) = 0 \ \text{(pro-rata principal payment)} \tag{7}$$

In addition to the price, the model estimates the expected final payment date, that is, the date when the entire invested amount (principal) is repaid.

We consider the modification to the enhancement percentage as described by the terms of the offering memorandum and its potential effect on the price calculation. We also examine the extent to which the liquidation rate may affect the price of the notes.