

# Using expected loss to price credit risk: derivatives and factoring

14 Apr 2010

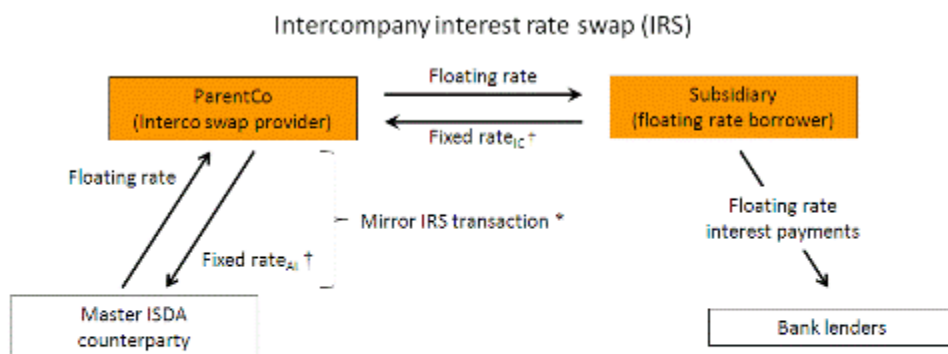
*Gordon Hands of CUFTanalytics examines two example cases, an interest rate swap and a factoring transaction, where expected loss (EL) is used to price the credit risk portion of the intercompany financial transaction.*

Some intercompany financial transactions, such as derivatives and factoring, cannot be priced in a reliable manner using comparable uncontrolled financial transactions. Arm's-length derivative transactions, such as interest rate swaps, currency swaps, forward rate agreements and so on, and (receivables) factoring transactions are priced, in part, by determining the market price for credit risk exposure (in the case of derivatives the credit risk exposure can be to one or to both of the participating parties).

The arm's-length credit risk component for these types of intercompany financial transactions can be determined using the concept of expected loss ( $EL = \text{probability of default (PD)} \times \text{loss given default (LGD)}$ ).

## Interest rate swap (IRS)

Consider a situation in which the subsidiary has an exposure to an increase in the interest rate on its third-party debt over the next five years which it would like to mitigate through an IRS with its parent company. The subsidiary enters into an IRS with its parent company (ParentCo) where by it pays a five-year fixed rate to and receives a floating rate from ParentCo.



\* To eliminate its interest rate risk, ParentCo would likely enter into a mirror IRS transaction under a master ISDA agreement with a third party financial services company.

† The fixed rate paid by the subsidiary to ParentCo (fixed rate<sub>e,C</sub>) will be greater than the fixed rate paid by ParentCo to its arm's length master ISDA counterparty (fixed rate<sub>e,A</sub>) due to the lower credit quality of the subsidiary.

What is the arm's-length charge for this intercompany derivative transaction? In this case what is the fixed interest rate that ParentCo should charge to its subsidiary?

Typically in an IRS the floating rate flows (for example, a three-month USD LIBOR) received by the subsidiary from ParentCo and paid by the subsidiary to the bank lenders are the same. Therefore the pricing exercise is to determine what the fixed rate should be such that the present value of the swap for both parties is equal on a credit risk adjusted basis.

The transfer pricing analysis is to determine the appropriate credit risk spreads (the expected loss) that should be added to the appropriate risk-free rate to determine the discount rates that are applied to the respective interest payment flows (both floating and fixed rate payments for the term of the swap). ParentCo is assuming a higher level of credit risk in the intercompany IRS transaction. Therefore, the discount rate applied to the fixed rate payments should reflect this higher level of credit risk. The subsidiary is also assuming credit risk of ParentCo but the credit risk is lower; therefore the discount rate for the floating rate interest payments is lower.

## Factoring

Whether it is a sale of a portfolio of trade-related receivables from one member of a multinational group to another (maybe as part of a business restructuring transaction) or factoring as a financing arrangement between related parties the determination of the factor (or discount) rate, in part, requires an estimate of the price of the credit risk related to the trade debtors.

Credit risk estimation models can be used to determine the forward-looking probability of default (PD) for each of the trade debtors. Combining PD with an estimate of the LGD on the trade receivable in the event of default by the trade debtor, gives an

estimate, or price, for the credit risk, which is expected loss. The factor rate (which depends on an assumption of days sales outstanding, or DSO) is calculated from the sum of the credit risk component, the time value of money and the price for any account receivable management services provided as part of the factoring arrangement.

Gordon Hands ([gordon.hands@CUFTanalytics.com](mailto:gordon.hands@CUFTanalytics.com)). For more information about CUFTanalytics and our services please visit our website at [www.CUFTanalytics.com](http://www.CUFTanalytics.com)