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John Hollas and Gordon Hands of CUFTanalytics.com in Calgary, Canada, discuss determining the arm's-length interest rate on intercompany loans and the arm's-length fee on intragroup loan guarantees.

Intercompany Financial Transactions: Selecting Comparable Data


By John C. Hollas and Gordon Hands

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In selecting a transfer pricing method under Organization for Economic Cooperation and Development guidelines, taxpayers must consider the appropriateness of the method in view of several factors: the nature of the controlled transaction, determined in particular through a functional analysis; the availability of reasonably reliable information—in particular on uncontrolled comparables; and the degree of comparability of controlled and uncontrolled transactions, including the reliability of comparability adjustments that may be needed to eliminate differences between them.

In choosing a method for determining the arm's-length interest rate on an intercompany loan, or the arm's-length guarantee fee on an intragroup loan guarantee, much care should be taken when considering the availability, type, and quality of data that will be relied on. The two main sources of information for this inquiry are corporate bond data (yields and spreads), and corporate loan data (lending margins). [1]

[1] Other sources exist, but they are beyond the scope of this article. Examples include the data on credit default swaps, which has been used to price credit risk in intercompany financial transactions, and safe havens such as various applicable federal rates in the United States and the "rule of thumb" (the ultimate parent's weighted cost of debt) as proposed by the Australian Taxation Office.

After a thorough analysis, the authors have concluded that the most reliable information to use in determining the arm's-length price for intercompany financial transactions is the corporate loan data from the primary loan market.

Corporate Bond Data

There are two sources of corporate bond data: primary market data and secondary market data.

Primary market data consists of new corporate bond issues, including other types of fixed-income securities, such as medium-term note issuances. Depending on market conditions, this type of data is not readily available and is usually concentrated in higher credit quality issuers. The problem, from a transfer pricing perspective, is the lack of sufficient available data to use from the primary bond market on a regular basis.

The second source of corporate bond data is the secondary bond market. This data consists of daily yields-to-maturity for corporate bonds traded on that day with specific credit rating categories and is readily available. For example, it is possible to obtain sufficient data on the yield for a five-year BBB+ bond or any other maturity and credit rating category on a daily basis and then average the daily data over any time period.

But is the average corporate bond yield data sufficiently reliable to use for transfer pricing purposes?

Consider the daily corporate [2] bond yields for June 2009 (21 business days) for both the BBB- (Baa3) and BB+ (Ba1) ratings, which go from investment-grade to non-investment-grade even though the difference between them is only one notch. After deducting the same-day one-year Treasury bill yield from the daily bond yield, the median and interquartile statistics for the bond yield spreads were calculated. The results are presented in the following table: [3]

[2] The data includes only bonds issued by U.S. industrials and does not include financials such as banks and finance companies.

[3] The table is constructed from the June 2009 daily closing yields for all "one year to maturity" corporate bonds of the specific credit rating. The data is sourced from Bloomberg: the one-year Baa3 code is C0101Y and the one-year Ba1 code is C5061Y.

	BBB-	**BB+**
Max	4.43%	5.82%
Upper Q	4.35%	5.44%
Median	4.26%	5.10%
Lower Q	4.02%	4.96%
Min	3.73%	4.63%

Did the credit risk of the issuers of these bonds differ that significantly during the month? All of the bonds were of the same credit rating, so if they have the same credit risk, why do the yields differ? There are two general answers. First, the credit rating is not always an accurate reflection of the current credit risk perceived by the secondary bond market participants. Second, the yield for a specific bond depends on supply and demand factors or relative liquidity of the bond. Consequently, does corporate bond data from the secondary bond market meet the comparability standards set by the OECD's transfer pricing guidelines to achieve an arm's-length result?

Corporate bond yields and yield spreads are impacted by more than just the level of credit risk associated with the credit rating category of the bond. There are significant comparability differences, in particular in liquidity risk and other non-credit risk related factors, [4] that could impact the yield or yield spread and would need to be adjusted reliably and quantifiably to meet the arm's-length principle. In the authors' experience there is no consensus on how to make comparability adjustments for liquidly and other non-credit-related factors to the bond data. Now, the question is: Why is data from the secondary corporate bond market still being used to price a primary market loan transaction

when it is difficult—if not impossible—to make comparability adjustments?

[4] This is commonly referred to as the "credit spread puzzle" in academic literature. For an overview, *see* the Economic Letter issued by the Federal Reserve Board of San Francisco: Christensen, Jens, "The Corporate Bond Credit Spread Puzzle," FRBSF Economic Letter, No. 2008-10, 3/14/08.

Another comparability factor, in determining an arm's-length price for any type of intercompany transaction, is the level of market. Without reliable and quantifiable comparability adjustments, it is not appropriate to compare transactions occurring at the wholesale level of the market to those occurring in the retail market for purposes of determining the arm's-length price. Why, then, is it appropriate to compare data from the secondary bond market to an intercompany loan transaction that essentially is in the primary loan market?

Corporate bond yields in the secondary bond market are driven mainly by three risk factors:

- interest rate risk—the relative change in market interest rates;
- credit risk—a change in the credit quality of the specific bond issue or corporate issuer being traded; and
- liquidity risk—the relative supply of, and demand for, this type of corporate bond—or corporate bonds in general—by investors in the secondary bond market.

Changes in Market Interest Rates

Corporate bonds, as well as other fixed-income securities, usually are issued with a fixed interest rate or coupon. An investor purchasing corporate bonds in the secondary bond market would be concerned about changes in the market interest rate relative to the corporate bond's fixed coupon rate. The resale price of a corporate bond will move in the opposite direction of a change in market interest rates, which includes in the market interest rate the investor's expectation of future inflation rate or inflation risk. However, the impact on the resale price of the bond due to interest rate change will depend on the length of the remaining maturity of the corporate bond. Generally, the longer the remaining maturity of the bond, the greater the interest rate risk, as illustrated in the concept of a yield curve. A normal yield curve would be upward sloping with a significant difference in yield between short-term bonds and long-term bonds, holding the credit quality constant.

There are other related issues, such as the reinvestment risk. Some corporate bonds will have call features in which a bond can be redeemed at a specified price or ratio by the issuer prior to the bond's maturity date. Thus, if interest rates decline sufficiently, the issuer may exercise the call option and refinance the bond at a lower interest rate. While this is an attractive and valuable feature for the issuer, it makes the bond issue less desirable for the investor. So, the investor will demand a higher yield to hold this bond. For most corporate bonds with call features, data is available on the option-adjusted spread allowing for a reliable comparability adjustment.

Changes in Bond Credit Quality or Credit Risk

Clearly, a perceived change in the credit quality of the corporate bond would result in a change in the bond yield (and yield spread). But this is more than just a change in the external credit rating of a specific corporate bond. It is the bond investor's perception of a change in the credit quality of the corporate bond issuer or the specific bond issue, as measured by the expected default rate, that would result in a change in the bond yield.

Corporate bond yield data is tracked by the credit rating categories of the bond. Even if the credit rating has not changed—notwithstanding any credit watch signals given by the credit rating agency—the bond investor's perception of the credit quality of the bond issuer may have changed such that the bond investor does not consider the credit rating to be an accurate reflection of the bond's

credit quality and the bond investor's perception of the credit quality of the bond would be reflected in the bond yield but not necessarily the credit rating. Therefore, the secondary corporate bond yield data based on credit rating categories may not be an accurate reflection of the yields for bonds by credit rating category. In other words, this may not be an "apples to apples" comparison. This problem with the data also makes it difficult to conclude that the observed differences in the yield spreads between corporate bonds with the same maturities but with different credit ratings is due entirely to the differences in credit quality.

Perhaps a better way to organize the data would be to find a proxy for the bond investor's expected default rates for corporate bonds at the time of the resale or secondary bond market transaction. One such credit risk measure is the one-year forward-looking probability of default. Since this data is publicly available on a daily basis for corporate bond issuers, it would be a more accurate way to organize the data and reflect the change in credit quality.

Liquidity Risk: Supply and Demand Factors

Generally, it is possible to observe the presence of an illiquid market for certain corporate bonds by the magnitude of the difference between what an investor would be willing to purchase the bond for and what the holder of the bond would be willing to sell the bond for. The wider the spread between bid and offer, the more illiquid the market for that bond.

Overall, the corporate bond or secondary market is relatively liquid, at least for investment-grade issues (despite being somewhat illiquid compared with the market for government debt securities). However, sometimes specific corporate bonds or credit quality categories (say, non-investment-grade) of bonds are in limited demand by investors and are relatively illiquid. The liquidity risk impact is observable in the sharp increase in the yield and yield spread for corporate bonds at the bottom category of investment grade (BBB-/Baa3) and non-investment grade (equal to or less than BB+/Ba1) bonds.

Continuing with the example of corporate bond yield spreads in June 2009, the difference in the yield spreads fluctuated by as much as 117bp (see the following table). Could this difference be attributed to the higher credit risk of the non-investment-grade bonds (BB+) compared to the investment-grade bonds (BBB-)? Or could this yield spread difference be due to the relative liquidity of investment-grade bonds compared to non-investment-grade bonds?

	BBB- / BB+ Difference
Max	1.69%
Upper Q	1.62%
Median	0.80%
Lower Q	0.69%
Min	0.52%

In the previous example for BBB- rated bonds for June 2009, there also is an unexplained fluctuation in the yield spread of 70bp. In addition to the previously mentioned data collection problem that is based on using credit ratings, one other likely reason for yield spread fluctuation is daily changes in supply and demand factors that result in a change in the liquidity premium being sought by investors in the secondary bond market for BBB- rated corporate bonds. The secondary bond market is relatively more illiquid for non-investment-grade corporate bonds. So, it is not surprising to observe an even greater difference in the yield spread for the BB+ rated bonds (119bp).

Liquidity risk in corporate bonds is at the heart of the credit spread puzzle, [5] which has been examined by academics and finance professionals for decades. [6] The puzzle is that the observed credit or yield spreads—the actual corporate bond yield less the default-free rate—for corporate bonds is much higher than the implied credit risk based on the probability of default and loss given default (LGD)

analysis used by credit risk management professionals in financial institutions and industry.

[5] Amata, J.D., and Remolana, E.M., "The Credit Spread Puzzle," *BIS Quarterly Review*, 12/5/03, pp. 51-63.

[6] Altman, E.I., "Measuring Corporate Bond Mortality and Performance," *Journal of Finance*, 44 (1989), pp. 902-22.

Based on Moody's 2009 corporate default and recovery rate report, the expected credit loss rate for the whole letter Baa credit rating (BBB in Standard & Poor's rating scale) is 0.480 percent, or about 48bp. However, in June 2009 the observed average yield spread on an option adjusted spread basis for a Baa3 rated corporate bond was 466bp. That is almost 10 times the estimated credit risk. This is the credit spread puzzle.

Most attempts to explain the credit spread puzzle have focused on the liquidity risk premium a bond investor would require to own this asset class as an investment. But liquidity risk is not the whole story. Without fully understanding the factors that have a major impact on the corporate bond yields and yield spreads, there is no starting point for making reliable comparability adjustments.

Refer to the Appendix for a review of selected academic literature on the credit spread puzzle.

Corporate Loan Data

In the past decade or so, the secondary loan market has evolved and matured. Theoretically, the purpose of this market is to facilitate a risk mitigation strategy by lenders or banks. Lenders would continue to be active in the corporate loan origination market. However, they would be able to sell the loan or a portion of it to other market participants if the lenders are overexposed to that particular corporate borrower, the industry or economy, or the country or geography. The problems with using this secondary loan market data are similar to the problems with using data from the secondary bond market. The transactions occurring between banks or financial institutions are motivated by other factors, including the credit quality of the underlying loan, in determining the yield on the resale of the corporate loan. So, to use this type of data in pricing intercompany financial transactions the differences would need to be adjusted for in a reliable manner. The question is, can this be done?

Next, consider the characteristics of the primary corporate loan market, which originates loan transactions between a lender (usually a syndicate of banks or other types of financial institutions) and a corporate borrower. Typically, corporate loans are priced based on a reference rate—a published market rate that acts as a proxy for the lender's cost of funds, plus a lending margin—that provides a return to the lender for credit risk, non-interest expenses, and profit. The data on lending margins for corporate loans is available in publicly filed credit agreements with the Securities and Exchange Commission. The following table shows the number of comparable uncontrolled financial transactions (CUFTs) from the credit agreements (including all tranches with sufficient pricing data) filed by U.S. borrowers for 2004 through June 2009.

CUFT Agreements with U.S. Borrowers	Number
2004	4,521
2005	4,738
2006	4,753
2007	4,450
2008	2,515
January to June 2009	1,770

While obtaining similar data in other countries with less stringent filing requirements is more difficult, there are methods to adjust for differences in the pricing of credit risk embedded in the lending margins. Specifically, there can be a difference in the severity of the loan loss, should the borrower default, due to differences in bankruptcy or other legislation in various countries. Therefore, the

differences in the LGD are a basis for quantifying and making a comparability adjustment to the U.S. data for the use of that data for related-party borrowers in other countries.

As discussed above, unlike corporate bond spreads, credit spreads (or lending margins) on corporate loans focus primarily on the credit risk component as opposed to secondary bond market factors (such as liquidity risk) that are not characteristics of an intercompany loan. To illustrate this point, the authors searched for yield data on 10-year corporate bonds (rated B3/B-) from the secondary bond market in pricing an intercompany loan transaction to a U.S. related-party borrower in December 2008. The result was a range of observed bond yields on an option-adjusted-spread basis between 15.25 percent and 17.22 percent. The authors then searched for comparable loan transactions—such as credit agreements filed with the SEC—in the primary corporate loan market and determined an arm's-length range of interest rates at 6.6 percent to 8.2 percent, with a median of 8 percent. The higher yields on corporate bonds are required to compensate investors for increased liquidity risk and the investors' perception of potentially higher default rates on corporate bonds in the next year or so.

Conclusion

In the authors' opinion, the use of corporate bond data from the secondary bond market does not meet the arm's-length standard unless comparability adjustments can be made for the major differences (such as liquidity risk) in a reliable manner. Therefore the most reliable data to apply the transfer pricing method, with comparability adjustments for execution date, asset class, tenor, industry and geography), [7] is the corporate loan data from the primary loan market.

[7] *See* "Comparability Adjustments: Finding an Arm's-Length Interest Rate," 18 *Transfer Pricing Report* 525, 9/24/09.

Appendix: Review of Selected Literature on the Credit Spread Puzzle

Amato & Remolana (2003) noted that spreads on corporate bonds tend to be many times wider than what would be implied by expected default losses alone. These spreads are the difference between yields on corporate debt subject to default risk and government bonds free of such risk. While credit spreads are often understood as the compensation for credit risk, it has been difficult to explain the precise relationship between spreads and such risk. For example, in 1997–2003 the average spread on BBB- rated corporate bonds with three to five years to maturity was about 170bp at annual rates. Yet, during the same period, the average yearly loss from default amounted to only 20bp. In this case, the spread was more than eight times the expected loss from default. The wide gap between spreads and expected default losses is what the authors call the credit spread puzzle. In this article, the authors argue that the answer to the credit spread puzzle might lie in the difficulty of diversifying default risk. Most studies to date have implicitly assumed that investors can diversify away the unexpected losses in a corporate bond portfolio. However, the nature of default risk is such that the distribution of returns on corporate bonds is highly negatively skewed. Such skewing would require an extraordinarily large portfolio to achieve full diversification. Evidence from the market for collateralized debt obligations (CDOs) indicates that in practice such large portfolios are unattainable and thus unexpected losses are unavoidable. Hence, the authors argue that spreads are so wide because they are pricing undiversified credit risk.

Amato, J.D. & Remolana, E.M., "The Credit Spread Puzzle," *BIS Quarterly Review*, 12/5/03.

Collin-Dufresne, Goldstein & Helwege (2003) focused on "contagion" risk, whereby the default of one firm affects the market's perception of the risk in other firms. One example is the default of Enron, which raised concern about the quality of accounting and auditing across the market. Such risk cannot be diversified away and the evidence suggests that this may account for a significant part of the credit spread—for example, up to 20bp. Collin-Dufresne et al. suggested that the size of the contagion risk premium may relate to a "flight-to-liquidity" effect, as per Longstaff (see below), rather than a reflection of future default risk.

Collin-Dufresne, P., Goldstein, R.S., and Helwege, J., "Is Credit Event Risk Priced? Modeling Contagion

via the Updating of Beliefs," Working Paper, Carnegie Mellon University, 2003.

Dionne, Gauthier, Hammami, Maurice & Simonato (2004) extended the model of Elton, Gruber, Agrawal, and Mann (see below) to allow for the small-sample bias in the historic data. They found that the expected default rates explain a much higher proportion of the credit spread. For example, 37 percent compared to 17.8 percent in Elton et al. for A- rated bonds and 76 percent compared to 34 percent for BBB- rated bonds.

Dionne, G., Gauthier, G., Hammami, K., Maurice, M., and Simonato, J.G., "Default Risk on Corporate Yield Spreads," Working Paper, HEC Montreal, 2004.

Driessen (2005) analyzed the spread on BBB- rated corporate bonds and identified six components:

- systematic risk (both expected defaults and beta effect)—33 percent;
- default-jump premium—24 percent;
- firm-specific factors—4 percent;
- negative correlation of interest rate risk—9 percent;
- corporate tax effects—33 percent; and
- liquidity premium—13 percent.

Driessen, J., "Is Default Event Risk Priced in Corporate Bonds?" *Review of Financial Studies*, 2005.

Elton, Gruber, Agrawal & Mann (2001) explain the spread between rates on corporate and government bonds, showing that expected default accounts for a surprisingly small fraction of the premium in corporate rates over treasuries. While state taxes explain a substantial portion of the difference, the remaining portion of the spread is closely related to factors commonly accepted as explaining risk premiums for common stocks. Both the time series and cross-sectional tests support the existence of a risk premium on corporate bonds.

Elton, E.J., Gruber, M.J., Agrawal, D., and Mann, C., "Explaining the Rate Spread on Corporate Bonds," *The Journal of Finance*, Vol. LVI, No. 1, 2001.

Huang & Huang (2003) obtained a lower estimate than Elton et al. of the portion of the credit spread that can be explained by credit risk. Huang & Huang surveyed structural credit models and concluded that only between 20 percent and 30 percent of the credit spread can be explained by credit risk for investment-grade corporate bonds, although the proportion is much higher for high-yield junk bonds.

Huang, J. and Huang M., "How Much of the Corporate-Treasury Yield Spread Is Due to Credit Risk?" Working Paper, Stamford University, 2003.

Hull, Preduscu & White (2003) observed that historical default rate statistics typically cover only the period since 1970. So, market participants may allow for the risk of more extreme events occurring than observed in this relatively short period. Hull et al. also suggested there may be an agency effect because portfolio managers are not incentivized to seek maximally diversified portfolios, particularly if this reduces expected returns.

Hull, J.C., Predescu, M., and White, A., "Bond Prices, Default Probabilities and Risk Premiums," Working Paper, University of Toronto, 2003.

Longstaff (2004) compared the prices of U.S. Treasury bonds to those issued by REFCORP, a U.S. Government agency, which are effectively guaranteed by the U.S. Treasury but are less liquid. Longstaff found significant evidence of a "flight to liquidity" effect, whereby U.S. Treasuries command a premium, particularly in times of uncertainty in financial markets such as the Russian default in

1998. The annual "flight to liquidity" premium averages around 10bp, but has risen to as high as 50bp.

Longstaff, F., "The Flight-to-Liquidity Premium in U.S. Treasury Bond Prices," *Journal of Business*, Vol. 77, 2004.

Longstaff, Mithal & Neis (2005) focused on evidence from the credit default swap (CDS) market to quantify the credit risk premium. They concluded that the credit default related component of the credit spread accounted for 51 percent of the spread relative to U.S. government bonds for AAA/AA-rated corporate bonds, 56 percent for A- rated corporate bonds, 71 percent for BBB- rated corporate bonds, and 83 percent for BB- rated corporate bonds. If the spread is measured relative to CDS, then the credit default related component accounts for close to 100 percent of the spread. Longstaff, Mithal & Neis found lower estimates for the impact of tax than Elton et al., reflecting the fact that some marginal corporate bond investors may be tax-exempt. They found that the residual non-default related component is related to macroeconomic measures of liquidity, as per Longstaff's flight-to-liquidity effect, with bond-specific illiquidity measures important in accounting for differences between yields on corporate bonds.

Longstaff, F., Mithal, S., and Neis, E., "Corporate Yield Spreads: Default Risk or Liquidity? New Evidence from the Credit-Default Swap Market," *Journal of Finance*, 2005.

Li, Shi & Wu (2005) estimated the liquidity effect for corporate bonds, using a liquidity risk factor based on data for liquid versus illiquid U.S. Treasury bonds. Their results showed a significant liquidity premium that explains 25 percent of the spread for investment-grade bonds and 30 percent to 40 percent for speculative (non-investment) grade bonds. Li, Shi, and Wu have not analyzed credit risk premiums, in contrast to most of the above authors, who started with the credit risk premium and then analyzed only the residual spread for any liquidity effects. Li, Shi, and Wu's "liquidity premium" may therefore overlap with the "risk premium" found by other researchers.

Li, H., Shi, J., and Wu, C., "Estimating Liquidity Premium of Corporate Bonds Using the Spread Information in On- and Off-the Run Treasury Securities," Working Paper, 2005.

Perraudin & Taylor (2003) extended the Elton et al. model to examine liquidity effects. Perraudin and Taylor find spread differences of 10bp to 28bp due to liquidity effects between relatively liquid and illiquid high quality (A to AAA) corporate bonds. However, this is a relative effect between different corporate bonds and does not explain the credit risk puzzle for liquid corporate bonds.

Perraudine, W.R.M., and Taylor, A.P., "Liquidity and Bond Market Spreads," Bank of England, 2003.

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