# The relationship between CDS and bond spreads

Understanding the drivers of basis between Credit Default Swaps (CDS) and bond spreads is important in correctly interpreting prices from each market. **Daniel Berman** from JPMorgan explains.

Growth in the credit derivative market means that the CDS has become crucial to corporates as they seek to understand the bond markets and monitor investor appetite for funding opportunities or buybacks. This review discusses the pricing methodology of the basic credit default swap, the equivalent spread measure for corporate bonds, considers how CDS and bond spreads relate to one another, and how CDS may on occasion drive bond spreads.

**COMPARING CDS AND BOND SPREADS** Credit spreads reflect the market's perception of credit risk. In any efficient market the return for taking a risk must equal the loss expected as a result of that risk. If this not the case, for instance, were the expected loss under a CDS contract to be lower than the spread paid for the protection, there would be a pure arbitrage opportunity. Given this efficiency axiom, we can calculate the expected loss under a contract directly from its market price.

Taking a practical example, if Sainsbury 5 year credit protection is trading at 100 bps mid-market, the loss expected under a 5 year CDS contract equals approximately the sum of the premia received over the contract's life, i.e. 500bps. Adjusting for positive interest rates and the time value of money, a more accurate present value calculation of these periodic payments gives us a 4.8% expected loss by going long on Sainsbury credit risk through a 5 year CDS contract.

This is in fact no different to the information contained in bond prices. However, as a typical fixed rate corporate Eurobond bundles interest rate together with credit risk, it takes a little further work to reach the same conclusions. Specifically, before using bond prices to derive expected loss, we must decide which bond spread metric by which to measure the portion of a bond's return due to credit risk. While traditionally US Dollar and Sterling corporate bond markets have relied upon the spread of a corporate bond over the reference government bond, increasingly investors use the swap curve as their risk free reference, and therefore measure a bond's credit spread as its spread over swaps. Still there are more choices – between the asset swap, z- and i-spread of a bond (i.e. over the zero coupon or interest bearing yield curves). Each uses a slightly different methodology to compute the credit risk premium over the risk-free rate.

## Executive summary

- **A credit default swap (CDS) is analogous to an insurance contract, with the buyer of credit protection paying a periodic fee in return for receiving compensation should the specified reference entity experience a credit event during the contract's life.**
- **Although CDS and bonds measure equivalent credit risk, there are many factors which can cause their prices to diverge. This difference between them is called 'basis', and is calculated by subtracting the bond spread from the matched maturity CDS spread.**
- **Credit specific factors such as documentation, convertible issuance and the market's expectation of debt buybacks, as well as macro factors such as liquidity differences and segmentation between markets, low bond market supply and structured credit flows can all exert different pressures on bond and CDS spreads.**
- **Basis can be either positive or negative. Depending on its causes, it may present a short-term relative value opportunity for investors, or alternatively be long lasting.**
- **Understanding these factors will improve the ability of corporates to synthesize information from CDS and bond markets as they interpret investor appetite.**

While the asset swap spread is the most common measure of a bond's credit risk, it suffers distortion when the bond price is significantly above or below par. In the current low interest rate environment, many corporate bonds currently trade significantly in excess of par. As a result, we use z-spread as it takes the bond's cash price into account. Although there are further technical differences between z- and CDS spreads, the market is comfortable using these measures as a basis for comparison.

**THE BASIS BETWEEN BONDS AND CDS** While z- and CDS spreads measure very similar credit risks, we frequently see them trade at different levels in the market for the same issuer and maturity. This differential is called "basis", and is calculated by subtracting the z-spread from the CDS spread. To the extent the credit risks reflected in each spread are very similar, they should represent a relative value trading opportunity. As we discuss below, we don't consider these as being pure arbitrage opportunities as there are real differences between bond and CDS instruments as means for taking or hedging credit risk.

Market convention is that we describe the basis as negative when CDS trades inside (tighter) than the bond spread for the same maturity. When there is a negative basis an investor who is able to trade both CDS and bonds can earn a near-riskless return by buying a bond and credit protection of the same maturity in equal notional amounts. This is a 'negative basis package'".

Conversely if the CDS spread is higher than the bond spread for the same maturity, an investor should prefer to sell credit protection rather than own the bond. We don't really consider the latter a tradable package as the inefficiencies of the repo market for corporate bonds can make it difficult and expensive to borrow bonds in order to be able to sell them short.

Significant negative basis opportunities are generally short-term (as they are an attractive package trade for many investors), and positive basis does not generally represent a pure arbitrage opportunity in the same way.

Basis in general is an important indicator of relative value between bond and CDS markets, and a key trade and profitability driver for investors. Implicitly, any investor whose remit allows investment in either bonds or CDS, is always either long or short basis, depending on the composition of their portfolio between bonds and CDS. From a corporate perspective, understanding investors' actions and credit appetite requires analysis of the relevant investment alternatives. As CDS moves centre stage, the drivers of the differential between it and more traditional corporate credit products become a key component in this equation.

Issuers, as much as investors, will need to understand the drivers of basis starting with those which are credit, bond or maturity specific, and moving onto others which influence the trading relationships seen across the market.

**BOND COVENANTS** CDS and bond documentation are similar but not identical. CDS is a commoditised instrument with little customisation dependent on the referenced credit, whereas bond terms and conditions are a function of issuance strategy, credit strength, investor demand and market timing. An obvious example of this is significant differences in negative pledge language for investment grade issuers, which can result in varying levels of credit risk between different bonds of the same issuer, despite each being labelled senior unsecured.

An investor who is long credit risk through CDS will gain comfort from outstanding bonds of the issuer which have strong negative pledge language. However, should these bonds be redeemed early, the CDS, along with other bonds containing less restrictive covenant language, will be exposed to greater credit risk. This uncertainty – the risk of change to both corporate and funding structures – increases with maturity.

Similarly, bonds can contain conditional investor puts or issuer calls. The risks for holders of credit risk through bonds and CDS in these circumstances can diverge. A topical example is Sainsbury's bonds which contain an investor put at par following a ratings downgrade in certain circumstances, including a change of control. As there is no equivalent language in Sainsbury's CDS (as it is a standard contract), we would expect, and do, observe that Sainsbury bonds trade expensively (i.e. a lower spread) compared to its CDS. Investors comparing Sainsbury's bonds and CDS as investment alternatives are giving value to the possibility that this put is exercisable. This characteristic of the bonds is an important driver of the basis. To make it more complicated, the value of the documentation differences between Sainsbury's bonds and CDS will likely vary over time, as it depends on a number of factors, including:

- Interest rates: as interest rates rally, fixed rate Sainsbury bonds will appreciate in value. This decreases the potential value of the put which is fixed at a cash price of par, rather than calculated as a spread over Gilts or swaps.
- Sainsbury's credit quality: as Sainsbury's credit improves, the likelihood of investors gaining the opportunity to exercise the par put decreases, thus reducing the value of this potential option.

Similarly, the relationship of step up/down bonds, whose coupon levels are dependent on ratings, to CDS will depend on the market's expectation of future coupon settings. For example, if investors expect a telecom credit to be upgraded, its step up/down bonds will trade relatively cheap to CDS, reflecting the expected reduction in coupon.

**RESTRUCTURING** While Bankruptcy and Failure to Pay are likely to have equal economic impact on bonds and CDS, the third Credit Event in European CDS contracts, Modified Modified Restructuring does not have an equivalent in standard bond or loan documentation. This gives CDS protection higher value as it can trigger a payout in circumstances where any one of the issuer's bonds and loans have been restructured.

**DEBT BUYBACKS** If a company repurchases outstanding bonds before maturity, for example through a formal tender process, holders normally receive a premium to the current market level as an incentive for selling their holdings. While all of the company's bonds and CDS levels will benefit from this action reducing total debt, holders of the bond being repurchased stand to gain most. As a CDS does not reference specific bonds, but rather a category of credit obligation, CDS prices are unlikely to benefit to the same extent as the buyback target, assuming that other debt of the company remains outstanding. This implies that if the market has a high expectation of specific bond buybacks, CDS should trade at a greater positive basis to these bonds, as bond holders position themselves for early redemption and a resulting windfall payment.

**LIQUIDITY AND MARKET SEGMENTATION** Although a credit investor can equally obtain long credit exposure by buying a funded product such as a corporate bond, or by selling credit protection on the same entity, they may have a preference for one of these options. A possible reason is that

**Fig 1.** Credit Derivative Basics

**Credit Default Swaps (CDS) are the basic building block of the credit derivatives market. They allow investors to isolate and transfer credit risk, with a protection buyer transferring credit exposure on a reference credit to a protection seller. In exchange for this credit risk transfer, the protection buyer pays the seller a periodic fee. If the credit experiences a Credit Event, the buyer receives a cash payout reflecting the loss experienced by holders of defaulted debt obligations of that credit. Credit Events are standardised definitions of events that constitute a default, and vary geographically.**

**We consider the credit risk taken by a protection seller as being equivalent to that of owning a similar maturity bond or loan, and conversely, the credit protection buyer's risk profile as being equivalent to an investor who has sold short a bond or loan of that credit. However, whereas a bond or loan is a funded instrument with principal payment and repayment at start and finish, a CDS is an unfunded contract, i.e. it is a swap. The credit risk that CDS references is not limited to a particular bond or loan, but common across many debt obligations of a specified credit.**

**A CDS is a bilateral contract, so it can be of any maturity, currency or size that the two parties wish to trade with one another, irrespective of the issuer's outstanding obligations. Trading bonds and CDS both involve almost identical credit risk, so we find that the premium paid for transferring credit risk through each is very similar.**

ISSUERS, AS MUCH AS INVESTORS, WILL NEED TO UNDERSTAND THE DRIVERS OF BASIS STARTING WITH THOSE WHICH ARE CREDIT, BOND OR MATURITY SPECIFIC, AND MOVING ONTO OTHERS WHICH INFLUENCE THE TRADING RELATIONSHIPS SEEN ACROSS THE MARKET.

**Fig 2.** Basis for European Corporate Bonds (bps)

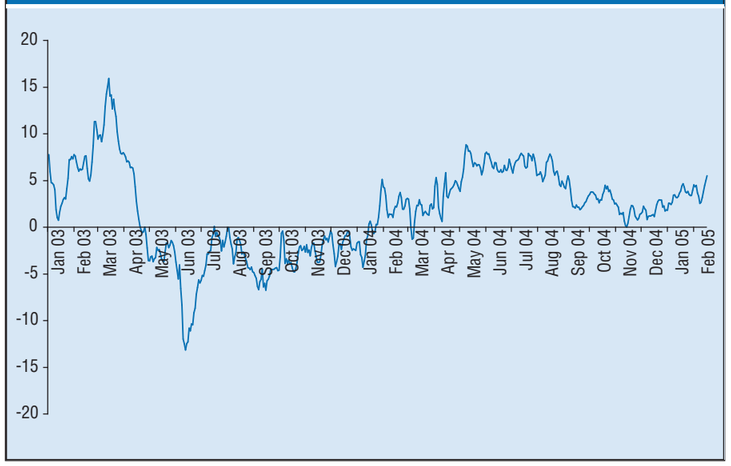


FIGURE 2 ILLUSTRATES THE POWER OF THESE MARKET-WIDE SUPPLY AND DEMAND FACTORS THROUGH THE AVERAGE BASIS OF ALMOST 300 EUROPEAN CORPORATE BONDS TO CDS SINCE 2003. THE NET EFFECT HAS BEEN BOTH POSITIVE AND NEGATIVE OVER THE PERIOD. BETWEEN JULY AND NOVEMBER 2004 STRONG STRUCTURED CREDIT FLOW PULLED CDS TIGHTER RELATIVE TO BOND SPREADS, REDUCING THE LEVEL OF POSITIVE BASIS.

their investment mandates do not allow them to transact derivative products. Were every investor indifferent between gaining credit exposure through bonds or CDS, the market would eliminate any arbitrage by selling corporate bonds and selling credit protection until the prices converged and the arbitrage eliminated, or vice versa. However, today this is not the case. Given that a significant percentage of the market is not yet using CDS, we can expect arbitrage opportunities to exist between the two for some time (although these should decrease as the market integration continues). Funds that cannot access CDS drag cash bonds tighter, but do not directly impact CDS spreads. When the positive basis becomes sufficiently large, we would expect trading desks and relative value long-short players who can use derivatives to take advantage.

However, as noted earlier, the inefficiency of the corporate bond repo market makes it difficult to extract value from positive basis except by taking a net long credit position, and therefore, in the absence of sufficient weight of investors selling CDS protection outright, positive basis differentials may be relatively long lasting. This efficiency impediment to the efficient clearing of credit risk across markets is likely to be a permanent driver of basis, as it is in equity markets where the stock-borrow cost has significant influence on cash and derivative prices.

An example of positive basis in the primary market is GECC's €1.25bn 7 year fixed rate bond issue in February of this year. While at that time 5yr GECC CDS was being quoted 22/24 bps and 7 years a few bps wider, the bond was priced at mid-swaps +11 bps. That means that European investors bought the new issue at least 11 bps through the CDS of the same maturity. Of the factors we have discussed, the best explanation for this is a combination of European investors' high cash balances, and scarcity of Triple-A corporate assets.

**CONVERTIBLES** The issuance of convertible bonds can also provide a good illustration of market segmentation. Many convertible accounts make investments decisions based on the implied valuation of the embedded equity option. To isolate this value, they often buy CDS protection to remove the credit risk. As they do so, the price of protection will increase. If, for the reasons discussed above, this does not induce sufficient bond holders to take advantage by switching out of tighter trading bonds and into a long credit position through CDS, a wider basis between bonds and CDS may be long lasting.

**LOW BOND MARKET SUPPLY** With corporate bond issuance having decreased significantly over the past 18 months, bonds have become an even more scarce commodity in the secondary markets. Managers of real money funds need to earn a total return on invested cash. This means they need to earn an interest rate return in addition to a credit premium. Thus, they will only sell credit protection if they can also find a high-rated asset yielding the swap rate. In the current market environment, without the ability to use derivatives, finding triple or even double-A assets to replicate the total return needed is very difficult.

**THE BID FOR STRUCTURED CREDIT** A supply-demand imbalance which has been exerting the opposite pressure on the conventional tendency for positive basis over the last 12 months is the "bid for structured credit". This term refers to the demand for leveraged credit product. This flow of funds is almost exclusively invested as a long credit position rather than also expressing short views. The strong flow of funds into this new asset class has been a key driver of the CDS market's rally, in that much of this structured credit product has been constructed using portfolios of single name CDS rather than corporate bonds. This can result in cash spreads lagging CDS following significant synthetic business flows.

The chart illustrates the power of these market-wide supply and demand factors through the average basis of almost 300 European corporate bonds to CDS since 2003. The net effect has been both positive and negative over the period. Between July and November 2004 strong structured credit flow pulled CDS tighter relative to bond spreads, reducing the level of positive basis. Since then the structured pipeline has disappointed, and consequently the basis has widened.

In increasingly integrated credit markets, CDS prices are a key indicator of risk appetite. Used by loan, bond and convertible market investors, they provide a single measure which is less prone to the technical distortions of each market. Understanding the factors driving basis is key to investors' relative value decisions, and to corporates' ability to synthesise information from the CDS and bond markets as they try to interpret investors' appetite and consequent funding or buyback opportunities.

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