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The credit default swap basis: illustrating positive and negative basis arbitrage trades

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A basis exists in any market where cash and derivative forms of the same asset are traded. Given that the derivative represents the cash asset in underlying form, there is a close relationship between the two types, which manifests itself in the basis and its magnitude. Fluctuations in the basis give rise to arbitrage trading opportunities between the two forms of the asset. This has proved the case in a more recent market, that in credit derivatives.

In Choudhry (2001) we summarise the logic behind the no-arbitrage theory of pricing credit default swaps (CDS), which suggests that the premium of a CDS should be equal to an asset-swap (ASW) spread for the same reference name. There are a number of reasons why this is not the case, described in Choudhry (2004), and in practice a non-zero basis exists for all reference names in the credit markets. The existence of a non-zero basis implies potential arbitrage gains that can be made if trading in both the cash and derivatives markets simultaneously. In this paper we describe two such trades, one illustrating the positive basis trade and one the negative basis trade.

Positive basis trade

In a positive basis trade the CDS trades above the cash spread, which can be measured using the ASW spread or the z-spread.[1] The potential arbitrage trade is to sell the basis, that is, sell the cash bond and sell protection on the same reference name. We would do this if we expect the basis to converge or narrow.

To illustrate this we describe an example of a basis trade in France Telecom. The cash side of the trade is a EUR-denominated bond issued by France Telecom, the 3.625% 2015, rated A3/A- and which is trading on 8 December 2005 as follows:[2]

Bond	France Telecom 3.625% 2015
ISIN	FR0010245555
Maturity	14 October 2015
Price	97.52 – 97.62 clean
ASW	42.9 basis points
z-spread	45.2 bps
CDS price	62 – 72 bps (10-year CDS)
Repo rate	2.06 – 2.02 (Libor minus 35 bps)

The asset swap spreads can be seen in Figure 1 (they are slightly different to the levels quoted above because the screens were printed the next day and the market had moved). This is Bloomberg screen ASW for the bond. The basis for this bond is positive, as shown in Figure 2, which is Bloomberg screen CRVD.

[1] See Choudhry (2005) for a description of the different ways to measure the basis and an example of a z-spread calculation.

[2] Prices are taken from Bloomberg (bond and repo) and market makers (CDS).

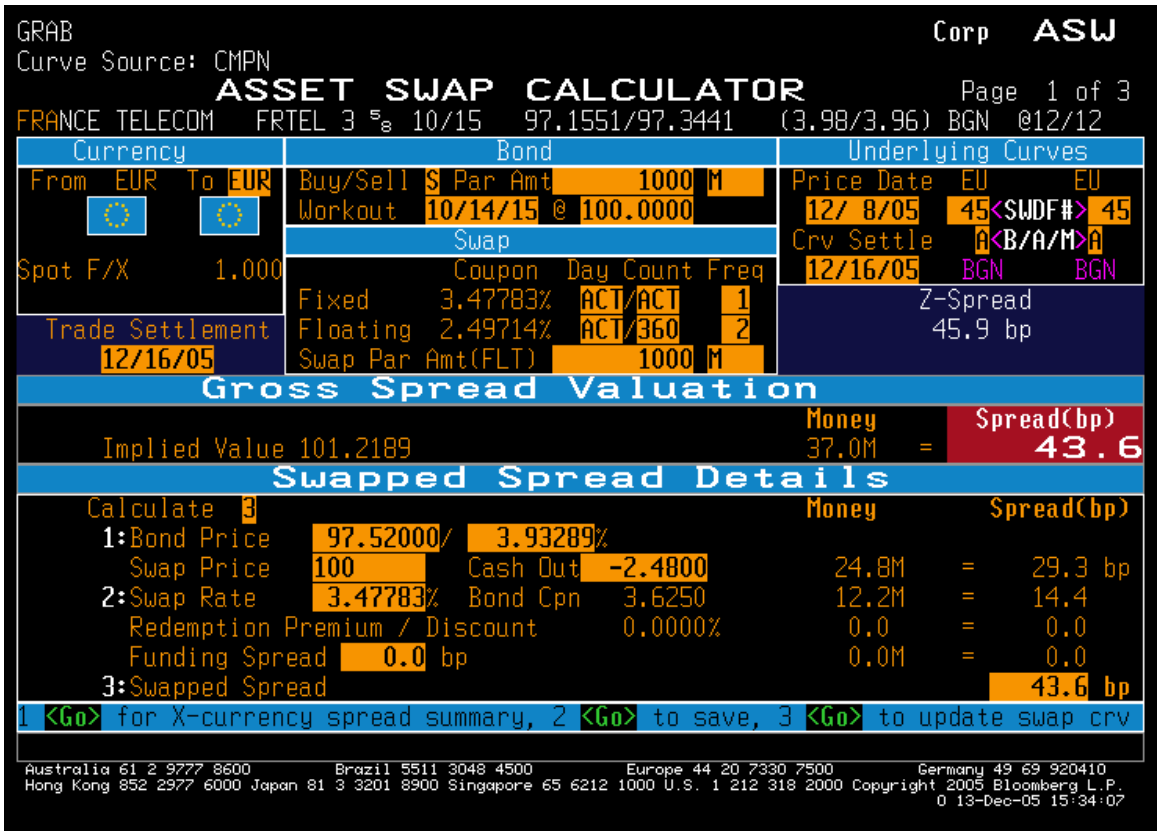

Figure 1 Asset-swap spread on screen ASW, France Telecom 3.625% 2015 bond, 9 December 2005

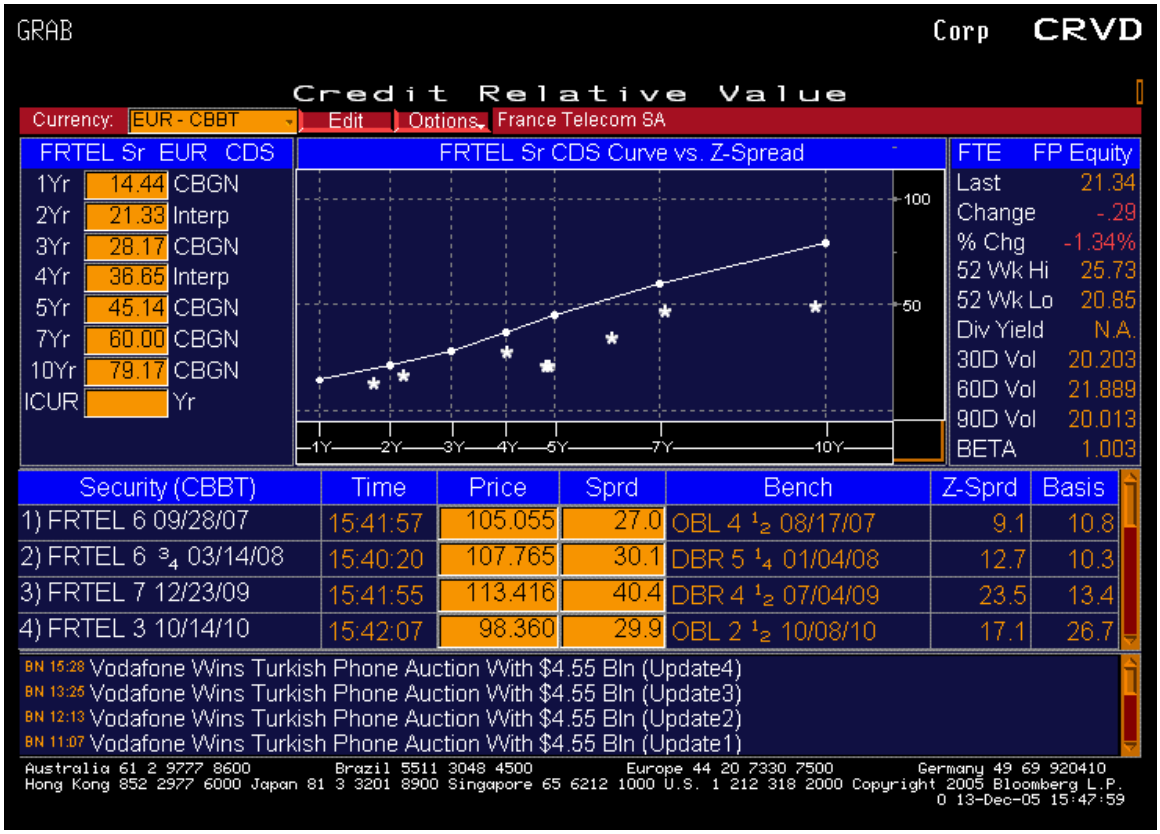

Figure 2 Cash-CDS basis for France Telecom, 9 December 2005

From the above we see that the basis is (62 – 45.2) or +16.8 basis points. If we have the view that the bond will underperform, or the basis will otherwise narrow and go towards zero and/or negative, we will sell the basis. We consider historical data on the basis during our analysis, as shown in Figure 3 which is from screen BQ and shows the one-year historical ASW against the five-year CDS spread.[3]

[3] Our view on where the basis is going may be based on any combination of factors; these can include speculation about future direction based on historical trade patterns, specific company intelligence such as expectations of a takeover or other buy-out, views on credit quality, and so on. We do not discuss the rationale behind the trades in this article, merely the trade mechanics!

Figure 3 One-year historical CDS-ASW spread, France Telecom, December 2005

The trade is put on in the following terms:

- Sell EUR 6 million nominal of the bond at 97.52 clean price, 98.1158 dirty price
- Sell protection EUR 7.5 million CDS at 62 bps

As we are shorting the bond we fund it in reverse repo, which is done at 2.02%, or Libor minus 35 bps.

The credit risk on the bond position is hedged using the CDS. The interest-rate risk ("DV01") is hedged using Bund futures contracts. The hedge calculation is a straightforward one and uses the ratio of the respective DV01 of the bond and futures contract; see Choudhry (2004b) for the hedge calculation mechanics.[4] From this we determine that we need to buy 52 lots of the Bund future to hedge the bond position.

The analysis is undertaken with reference to Libor, not absolute levels such as the yield-to-maturity. The cash flows are:

Sell bond:	pay 42.9 bps
Sell protection:	receive 62 bps

[4] The actual hedge calculation and spreadsheet illustration is given in Choudhry (2006b).

In addition the reverse repo position is 35 bps below Libor; this represents interest income foregone so we consider this spread a funding loss and we incorporate it into the funding calculation, that is, we also pay 35 bps. We ignore the futures position for funding purposes. This is a net carry of:

62 – (42.9 + 35)

or -15.9 basis points. In other words the net carry for this position is negative. We must expect to make a minimum greater than this in the trade itself to recover the negative carry.

Result

On 10 January 2006 we record the following prices for the France Tel bond and reference name:

Bond	France Telecom 3.625% 2015
Price	98.35 – 98.45
ASW	42.0 basis points
z-spread	43.8 bps
CDS price	61 – 65 bps

Spreads are shown at Figure 4.

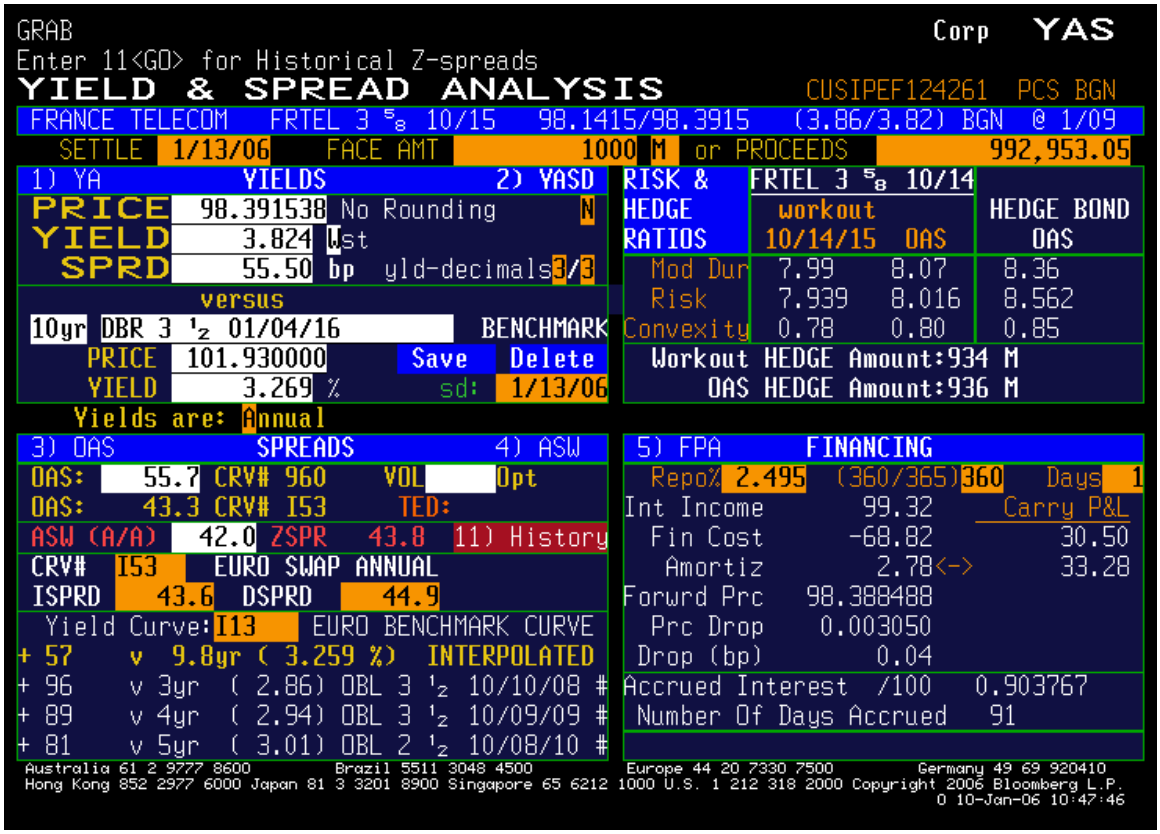

Figure 4 France Telecom bond YAS page for asset-swap and z-spreads, 10 January 2006

To unwind this position we would take the other side of the CDS quote, so the basis is now at (65 – 43.8) or 21.2 basis points. In other words it has not gone the way we expected but has widened. As we sold the basis, the position has lost money if we unwind it now. The decision to unwind would be based on the original trade strategy: if the trader's time horizon was six months or longer, then the decision may be made to continue holding the position. If the trader's time horizon was shorter, it is probably sensible to cut one's losses now. Note that this trade is running at negative net carry so it incurs a carry loss if maintained irrespective of where the basis is going.

Negative basis trade

A positive basis is the norm in credit markets. A negative basis is relatively rare to observe. In the event of a negative basis condition, the potential arbitrage is to buy the basis, that is, to buy the bond and buy protection on the same reference name. We illustrate such a trade here.

The bond identified here was observed as trading at a negative basis on 8 December 2005. It is the Degussa AG 5.125% of December 2013, which is a EUR-denominated bond rated Baa1 / BBB+. Its terms are as follows:

Bond	Degussa AG 5.125% 12/2013
ISIN	XS0181557454
Maturity	10 December 2013
Price	103.68
ASW	121.6
z-spread	122.7
CDS price	5 year: 75-80
	7 year: 95-105
	10 year: 113-123
	Interpolated 8-year offer: 111 bps
Repo rate	2.44 (Libor + 2)

These rates are seen in Figure 5, the ASW page for this bond, while the basis and basis history are seen at Figures 6 and 7 respectively. The basis is (111 – 122.7) or -11.7 basis points. We expect the basis to widen, that is, move from negative towards zero and then into positive territory. We therefore buy the bond, and buy protection on the Degussa name. The interest-rate hedge is put on in the same way as before; again, we weight the CDS notional amount to match the risk of the bond because the bond is trading away from par and so a greater amount of CDS notional is required.

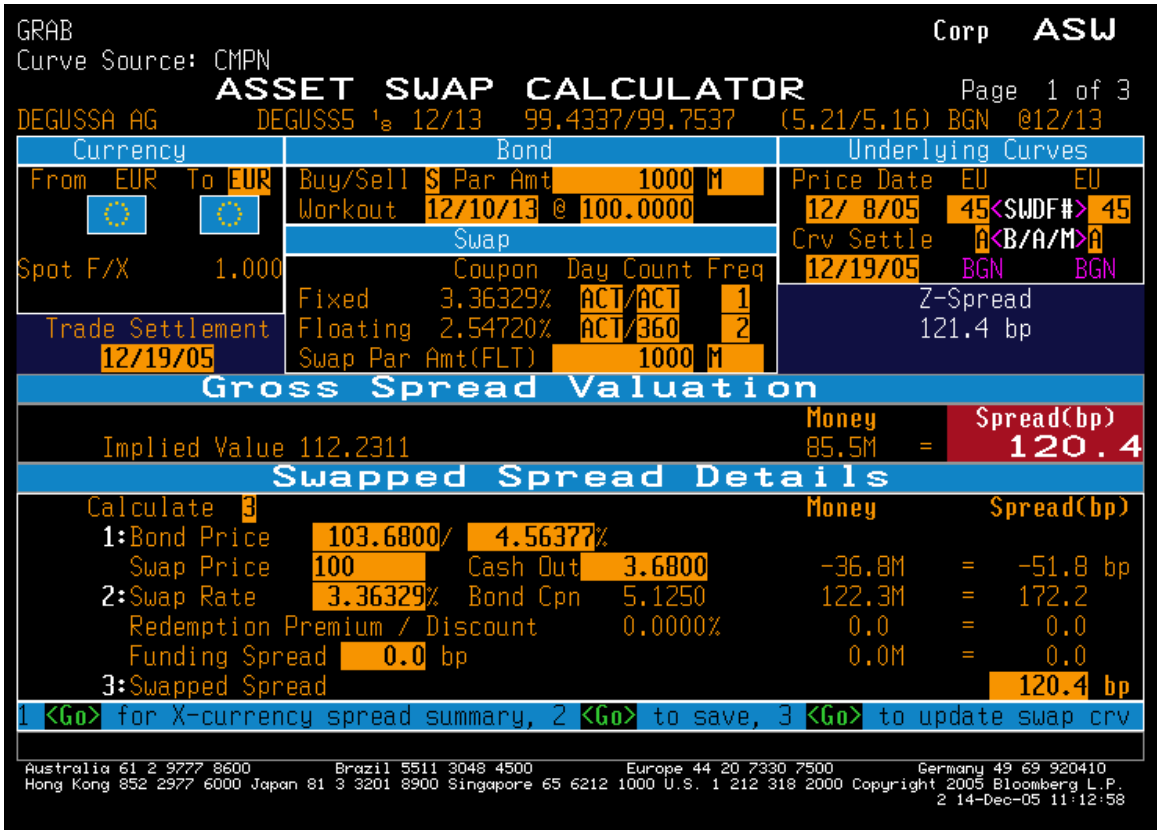

Figure 5 Degussa 5.125% 2013 bond, asset-swap page, 9 December 2005

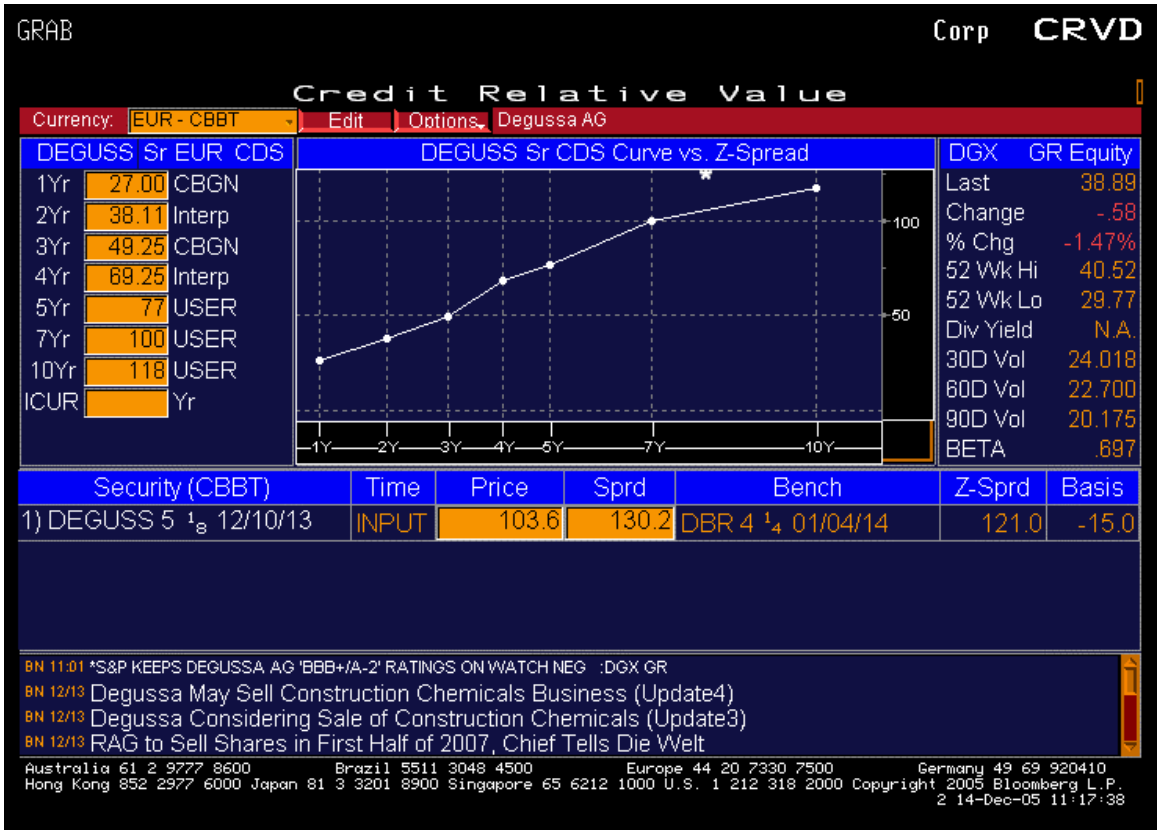

Figure 6 Cash-CDS basis, Degussa AG, 9 December 2005

Figure 7 One-year CDS-ASW spread, Degussa AG, 9 December 2005

The cash flows are as follows:

Buy bond	receive 121.6 bps
Buy protection	pay 111 bps
Repo	pay 2 bps

This is a net carry of +8.6 bps so this trade runs at a funding gain each day. We expect the basis to widen, at which point we will unwind the trade to extract our profit.

Result

On 10 January 2006 we record the following prices for the Degussa bond and reference name:

Bond	Degussa AG 5.125% 12/2013
Price	101.75
ASW	153.2 bps
z-spread	155.8 bps
CDS price	152 - 162

Spreads are shown at Figure 8.

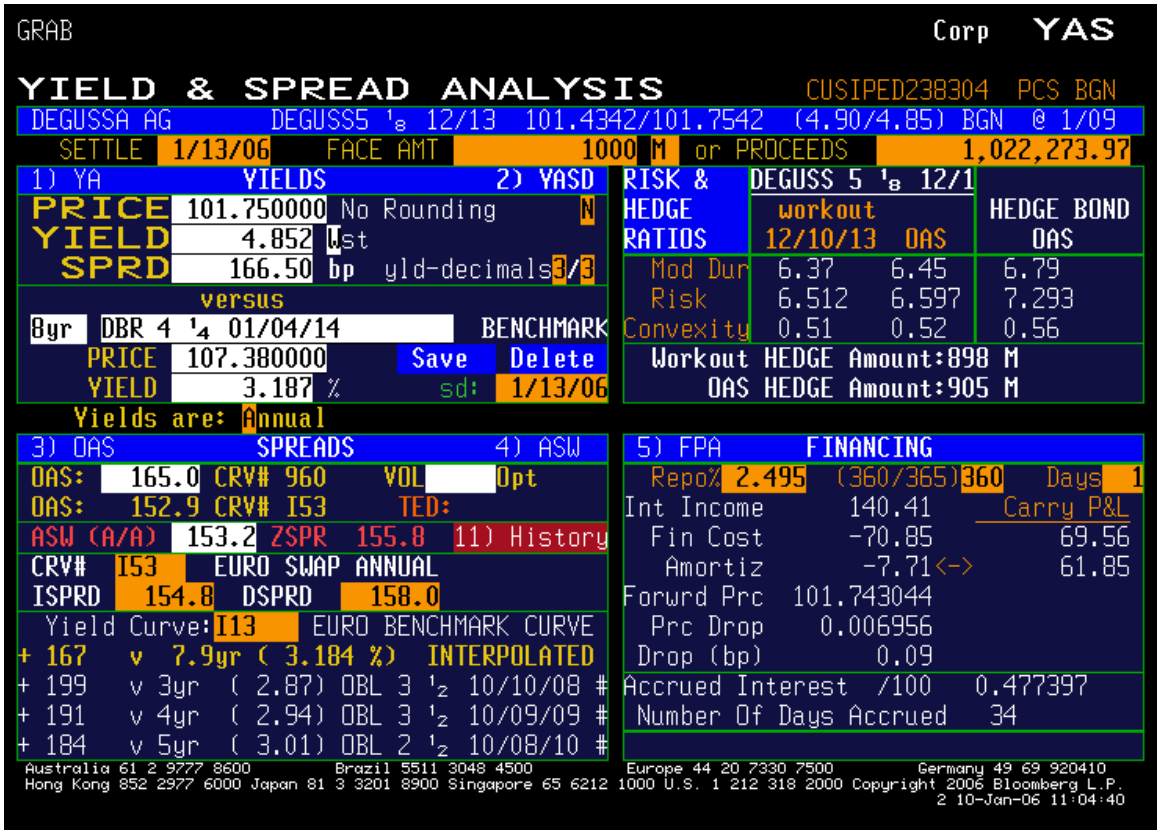

Figure 8 Asset-swap and z-spreads for Degussa bond, 10 December 2006

The basis is (152 – 155.8) or -3.8 basis points. The basis has tightened, as we expected, and is now in profit. The p&l is positive, and is (-11.7 – (-3.8)) or 7.9 basis points, together with the funding gain accrued each day. We can unwind the trade to take profit now or continue to run it, at a net positive carry, if we expect the basis to move further in the same direction and then into positive territory.

Notice how the gain itself it small, just a few basis points. Arbitrage basis trading in government bonds is often undertaken in very large size for precisely this reason, because the small potential gain means to make the trade worthwhile we have to deal in size. This is not always possible in corporate markets because of lower liquidity levels in the cash market.

Conclusion

The two trades we describe illustrate the mechanics for CDS basis trades, both positive and negative basis. We saw how an arbitrage gain can be made, at theoretically zero credit risk, be buying or selling the basis, provided our initial view is correct. Opportunities for basis trading are rare and often require good market intelligence on specific corporate names, which can be used to formulate views on these names. Hence an expertise in credit analysis is essential. In addition, liquidity levels in the cash Eurobond market can be low, depending on the name, and should therefore also be considered when formulating the trade idea.

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