



HOW MUCH BASIS WIDENING IS ACCEPTABLE?

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Abstract Loosely speaking, a basis widening implies a mark-to-market loss of a negative basis position. But how can this effect be quantified? To provide a feel for the mechanics of such positions, we carry out a tiny case study for our fund XAIA Credit Basis on 4 June 2013. We conjecture that if the current average basis widens by 35.4 bps within one year, and no management actions are undertaken, the fund is expected to have a PnL of zero, i.e. the carry inflows of the portfolio are eaten up by the mark-to-market loss due to the basis widening. These results are obtained by the analysis described in the sequel.

The setup at $t = 0$ on 4 June 2013 We consider a generic basis position consisting of only one straight bond, and a tailor-made CDS insurance for it. The specifications for bond and CDS are chosen such that this position mimics the overall portfolio of the fund XAIA Credit Basis on 4 June 2013. More precisely, the following specifications have been made, which were obtained as average values over the whole portfolio: EUR bond with maturity 7 years, coupon rate of 4.2028%, a recovery rate assumption of 37.02%, and a Z-spread of 482.4 bps. The 7 year EUR CDS spread is 291.5 bps and we assume that the nominals of bond and CDS match. The negative basis, measured according to the rudimentary Z-spread method, is given by $482.4 \text{ bps} - 291.5 \text{ bps} = 190.9 \text{ bps}$. Notice that this value, computed for our generic basis position according to the rudimentary Z-spread method, lies slightly below the actual average basis in XAIA Credit Basis, which is 206.8 bps according to the method (HY) on 4 June 2013. This is due to (i) the crude approximation of the whole portfolio by one generic position and (ii) the fact that the rudimentary Z-spread method differs significantly from our preferred measurement approach (HY). Nevertheless, for this tiny case study we take the approximation for granted. For background regarding the different measurement techniques, the interested reader is referred to Bernhart, Mai (2012).

The setup at $t = 1$ after one year After one year, we take a second look at our generic basis position, assuming no management actions in between. What can happen? Loosely speaking, there are three scenarios.

- (a) *The negative basis remains constant.* The position is expected to earn about 190.9 bps, which equals the negative basis (=carry).
- (b) *The negative basis tightens.* The position experiences a mark-to-market gain, but the expected future carry decreases (i.e. expected earnings are shifted from the future into the present). In this case, depending on the size of the tightening, portfolio management has to consider closing the position to realize the gain.
- (c) *The negative basis widens.* The portfolio suffers a mark-to-market loss, but the expected future carry becomes more (i.e. expected earnings are shifted from the present into the future). In this case, portfolio management might consider to even enlarge the position, because it is now expected to earn an even higher negative basis in the future, so new investment (or re-investment of earned carry) into this position is more attractive than it was initially.

The major market risk in the negative basis position is that scenario (c) occurs and the interim mark-to-market loss is so big that it becomes unacceptable, forcing portfolio management to close the position with a loss. One quite conservative possibility to define acceptability is to consider the position “acceptable” as long as the one-year PnL is at least non-negative. In this situation, a quantitative question is: how much can the basis widen so that the one-year PnL of the position is still non-negative? This question is answered in the subsequent analysis.

We are interested in how a basis widening affects the portfolio PnL. To this end, we assume that interest rates and CDS remain unchanged, but the bond’s credit risk increases. In our example, this implies a basis widening, and the portfolio suffers a loss.

The sensitivity of the one-year portfolio PnL with respect to the basis widening is visualized in Figure 1 below. If the basis widens from 190.9 bps to 226.3 bps (scenario (c)), then the one-year portfolio PnL is flat (i.e. the mark-to-market loss has eaten up the carry inflows). The bond position (including the coupon earnings) earns only about 3.5%, implying that the bond value drops. If the basis remains unchanged at a level of 190.9 bps (scenario (a)), the bond position earns about 5.5%. Adjusted by the CDS costs this implies a total portfolio PnL of 1.9%, which approximately equals the constant negative basis of 190.9 bps.

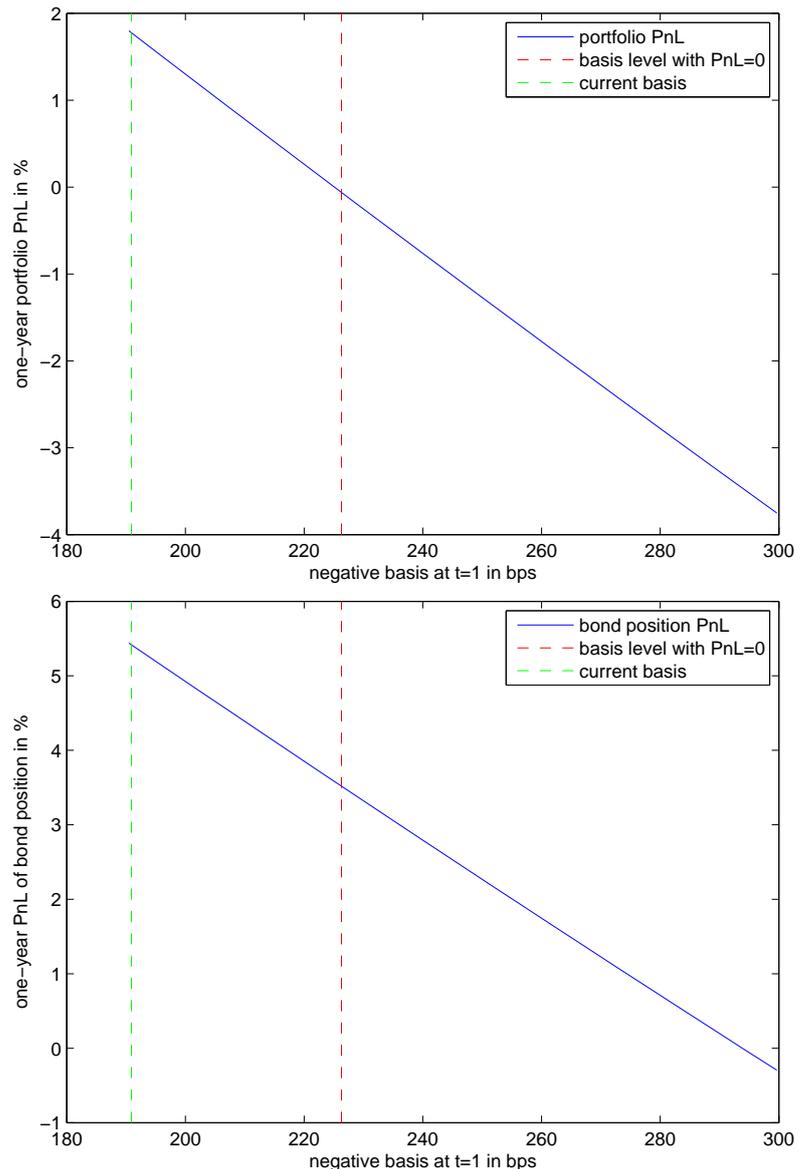


Fig. 1: Sensitivity of the one-year portfolio PnL with respect to a basis widening.

References G. Bernhart and J.-F. Mai, Negative basis measurement: finding the holy scale, *XAIA homepage article* (2012).