

# Wrong-way CVA done right

The financial crisis in 2007–2008 has led to more accurate pricing of wrong-way credit valuation adjustment

Credit valuation adjustment (CVA) has been at the forefront of many discussions since the 2007–2008 financial crisis as a result of losses taken by major market participants due to counterparty defaults on derivatives. Basel III will introduce changes that are expected to significantly increase the capital charge on uncollateralised exposures, and regulators are pushing mandatory clearing of derivatives to mitigate counterparty risk. As a result, banks have sharpened their CVA pricing and modelling infrastructure, and most have dedicated traders dynamically hedging their CVA for what it really is: a (very) complex exotic risk.

## Wrong-way risk

Earlier CVA models assumed no correlation between the counterparty default and the value of the derivative. This has proven to be a dangerous assumption. A bank buying US dollar forwards from an emerging market (EM) exporter against the EM currency is a good example of wrong-way risk. The credit spread of the counterparty would likely increase if that currency depreciated or if the counterparty exposure increased. Below we discuss how correlation and gap risk, especially when wrong way, can impact CVA books.

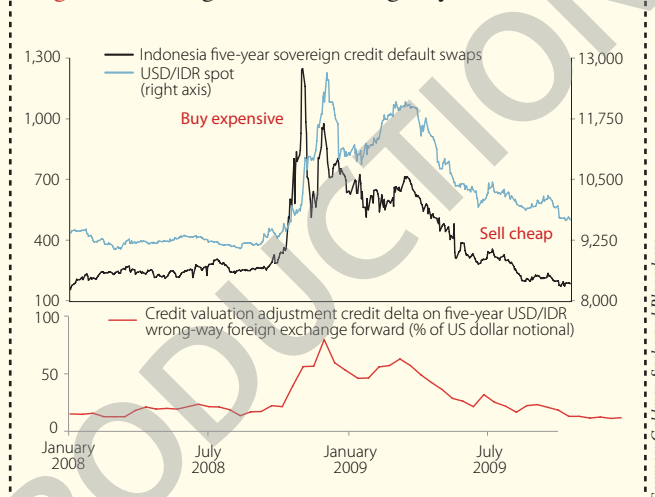
## Cross gamma hurts

Banks learned the hard way that they were short cross gamma. As EM currencies depreciated and credit exposures ballooned, they were forced to buy credit protection that had become very expensive. Later on, when EM currencies appreciated back, they had to sell back their credit protection at much tighter spreads as the market had normalised. Figure 1 illustrates this phenomenon with USD/IDR and Indonesia sovereign credit default swaps (CDSs) as an example. It is also worth pointing out that, even in less stressed scenarios, CVA desks should be realising some losses from rebalancing credit and foreign exchange hedges due to the negative cross gamma.

## Realised counterparty defaults hurt

Wrong-way correlation not only has a mark-to-market impact on CVA, but it also affects realised defaults. Many banks experienced much higher rates of default on trades with wrong-way risk than on those without. At a time when counterparties owed large amounts on these derivatives, they were under financial stress and had difficulty meeting their obligations. This effect is compounded by CVA desks being largely unable to hedge their jump-to-default risk, as it is not possible to trade single-name CDSs referencing the vast majority of their derivative counterparties. Instead, many CVA desks are proxy hedging their risk with index CDSs, sovereign CDSs or single-name CDSs referencing similar credits.

Figure 1. Cross gamma and wrong way



Sources: Goldman Sachs and Bloomberg

## Gap hurts

When defaults took place during the financial crisis, many were accompanied by large intra-day moves in the markets – gaps. Most banks did not charge CVA on fully collateralised derivatives, but counterparty defaults coinciding with intra-day gaps left them with losses. In cases where market underliers and counterparty defaults are not correlated, these intra-day moves are not biased and the derivative net present value (NPV) is as likely to move more in-the-money as it is to move less in-the-money for the dealer, due to the intra-day moves. Where there is wrong-way risk, however, this is not the case – the derivative NPV is more likely to move more in-the-money for the dealer due to intra-day moves upon a counterparty default. Expected credit losses from gap risks are thus even higher for wrong-way trades than they would otherwise be.

There has clearly been a re-pricing of CVA and wrong-way CVA since the crisis, driven by actual losses on cross gamma, gap risk and defaults, as well as by regulatory focus. Pricing wrong-way CVA correctly and dynamically hedging it as an exotic derivative risk has become more widespread, though we still see a non-negligible portion of trades priced with little to no CVA and wrong-way adjustments.

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