

# Swiss Re's \$750m solvency trigger coco is much riskier than it seems

The new coco from Swiss Re pays 6.375% annually but the trigger is set in an unusual way. *Jan De Spiegeleer, Jan Dhaene and Wim Schoutens* look at the risk of investors losing out

**O**n 5 March 2013, Swiss Re placed a \$750 million contingent convertible (coco) note. The order book was more than seven times oversubscribed, confirming a trend that began a couple of months earlier.

Investors' search for yield is doubtless one of the drivers behind the increased issuance of this kind of hybrid debt since the start of 2013. In times of low interest rates and rising equity markets, high yield debt clearly gains in popularity, with both equity and bond investors tempted to invest.

This is the context in which we can examine the new kid on the block: Swiss Re's 11.5-year US dollar issue. The bond is callable after 6.5 years, after which its coupon resets to the initial spread over the prevailing five-year dollar mid-swap rate. The coco bond is paying an annual 6.375% coupon, but the investor suffers a full write-down of the face value (and outstanding coupons), in case of a trigger event. It's an interesting extension to the contingent convertible market, which is still in its infancy and which lacks standardisation.

## Bank regulators have power in financial cocos

In the past few years we have witnessed similar coco bonds issued by financial institutions with trigger events based on the issuer's common equity tier one ratio. Some of these contingent capital bonds absorb losses through a conversion into shares, others through a write-down of the face value similar to the Swiss Re coco.

Usually, the trigger has been linked to a weakness in a capital ratio. Most often this corresponds to a common equity tier one (CET1) ratio equal to 5% or 7%. In most cases this so-called accounting trigger is accompanied by a non-viability trigger. This is the stick in the hands of bank regulators; it gives them full discretion over forcing a trigger of the coco bonds. The regulator can push the loss absorption mechanism into action even when the financial institution's most recent common equity tier one ratio is above the specified trigger level.

Coco bonds have their roots in Basel III. However, the Swiss Re note is somewhat different. It is a response to the upcoming implementation of Solvency II.

The permanent write-off only occurs upon a breach of a predetermined solvency ratio, which has been set at 125% of the Swiss Solvency Test (SST). The SST is a risk-based capital standard for insurance companies in Switzerland and has been in use since 2006.

At the point of issuance, Swiss Re had a substantial buffer: it had an SST of 202%. The SST ratio is a function of available and required capital based on an economic valuation of assets and liabilities, with an integrated forward-looking assessment of underwriting, financial market and credit risk. So the SST ratio can fluctuate from one reporting date to another, and such fluctuations can be significant.

## Insurers hedge against natural disaster

This is not the first time that Swiss Re has stepped into hybrid territory to shore up its capital base. In March 2012, the insurer issued a similar sized hybrid bond. This bond was perpetual and non-callable for the first 6.5 years. The coupon was 8.25% until the first call date, with an SST trigger set at 100%. The loss absorption was embedded in the anatomy of the bond through a possible conversion into shares.

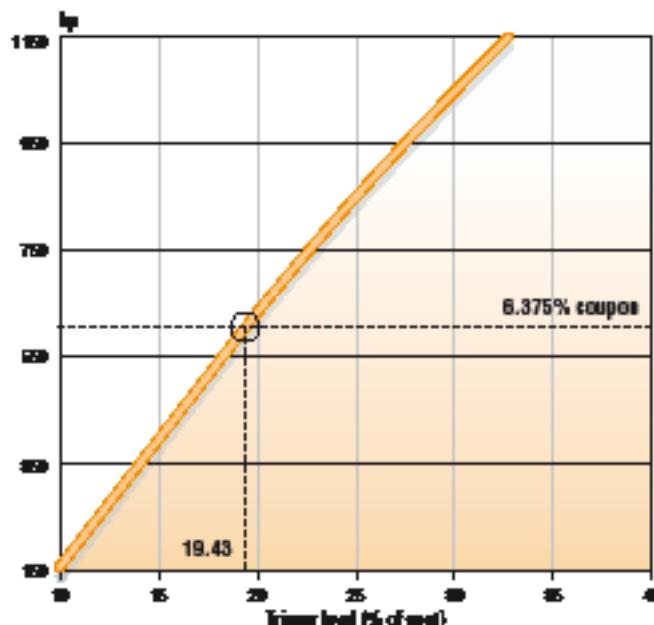
The Swiss Re bonds signal the appeal of coco bonds to the insurance industry. They may well be the first of a whole series of issues by insurers because they enable them to hedge against many risks, from huge natural catastrophes to financial market instability. Hence, there is a clear overlap with the catastrophe bonds that many have issued.

## Likelihood of Swiss Re trigger being pulled

Next, we explore briefly the probability of a trigger event in the Swiss Re bond and relate this to an equivalent stock price trigger. The methodology employed is the standard equity derivatives method developed by De Spiegeleer and Schoutens, which has been extensively applied in analysis of CET1-trigger coco bonds.

We use a series of barrier and digital options to price a structure paying out fixed coupons until maturity or until a stock price level  $S^*$  is hit, in which case the face

## 1: Coco spread at various trigger levels



value is written-down. The stock price level  $S^*$  can be implied from the current price of the bond. It is the value of the Swiss Re share price that is expected to occur when the solvency ratio fails to meet the minimum requirement specified by the trigger.

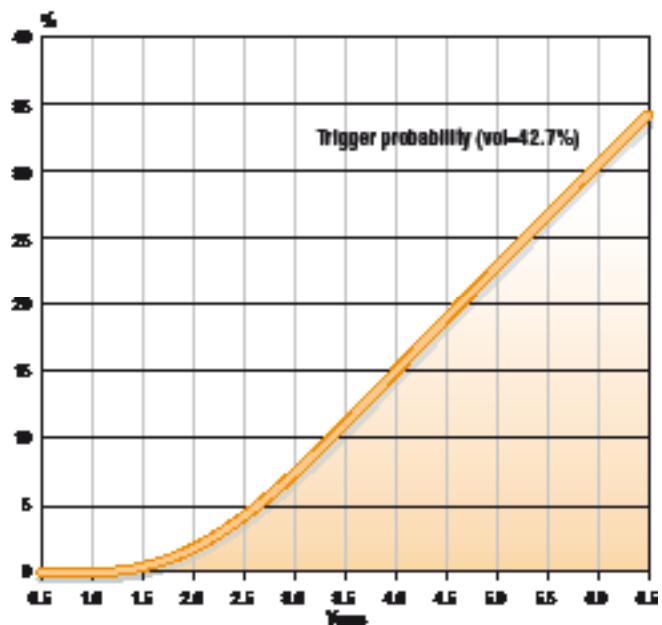
In particular, we examine the equity structure, with exactly the same maturity ( $T=6.5$  years) and coupon stream as the Swiss Re coco bond. The only difference is that our equity product is written down fully when a stock price level ( $S^*$ ) is hit, whereas the Swiss Re coco knocks out when the SST level breaches 125%. So, instead of modelling an accounting or solvency trigger, the problem is reduced to a barrier-linked equity derivative evaluation.

For this case study, we start with the extrapolation of the Bloomberg volatility surface to the given maturity and the 15% strike. We obtain an implied volatility of 42.7%. Next, we look for the stock price level  $S^*$ , such that the price of our equity note matches the Swiss Re coco price (99.41% at origination). From chart 1 (above), we see that, using this volatility estimate, we arrive at an estimate of  $S^*$  as being 19.43% of the current stock price.

The probability of hitting the respective levels during the lifetime of the note therefore equals about 34.1%. Chart 2 (above right) shows the probability of this occurring over the lifetime of the note.

Technically speaking, the latter is a risk-neutral probability, but it gives an initial insight into the risks of such cocos. The risk-neutral probability is the pricing probability incorporating the necessary risk-premia and risk compensations for an investor.

## 2: Trigger probability



### Contingent capital is likely to become more popular

In conclusion, we note that contingent capital bonds have evolved to use solvency triggers, which may indicate that the market for these kinds of issue could become increasingly significant and move beyond insurers, reinsurers and financial institutions.

However, although many investors seem to intuitively believe that the trigger levels are set at quite a distance from current marks, and therefore have very low probabilities of being breached, our figures suggest that, at least from a pricing perspective, the probabilities of triggers being hit are quite sizable.

This is the second time that Swiss Re has invited investors to participate in a loss absorbing product linked to its solvency ratio. The over-subscription illustrates the enthusiasm of the investment community for this new asset class, which appears to go head to head in competition with catastrophe bonds. It remains to be seen how many other insurers will follow in the footsteps of Swiss Re. The majority, perhaps, will wait until the uncertainty surrounding Solvency II is resolved.



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