

Key points

Insurance: Solvency II and currency risk

Introduction

The new Solvency II regulation defines the level of capital that insurers must hold in order to avoid insolvency given the risks that they incur. The Solvency Capital Requirement (SCR) is set with a view to protecting the insurer against an extreme event occurring in a particular year with a 99.5% confidence threshold.

1 A brief reminder of currency exposure treatment under Solvency II

For life-insurance companies, one of the main risks that requires capital to be released is the risk of market fluctuations (market SCR). Currency risk is incorporated into the calculation of market SCR. It is then aggregated with the other SCRs to obtain the market SCR and then the overall SCR. This is not calculated just by adding but takes correlations into account.

In the standard formula for calculating SCR, the regulator specifies the capital required for currency exposures and indicates that, for each currency, the upside or downside impact on the insurer's asset-liability value should be calculated, with a standard stress scenario of 25% fluctuation in the currency.

Each currency's contribution to the overall SCR is the greatest loss that occurs in the two above scenarios. For simple cases, this amounts to calculating the net currency positions based on the asset and liability positions for each currency except the home currency and applying a capital requirement equal to 25% of the position, whatever the sign. However, certain currencies which are highly correlated to the euro receive preferential treatment.

The total currency SCR is then obtained by summing the currency SCRs on all currencies on which the insurer has a net position, without taking into account the sign of the exposures.

“ In simple cases, the capital requirement represents 25% of the foreign-currency asset-liability position, whatever the sign ”

- Currency risk treatment under Solvency II is consistent with other asset classes and historical observations when it involves simple positions.
- Given its simplistic and extremely severe consideration of correlations, it can have a highly negative impact on arbitrage positions involving correlated currencies.
- Aggregating the currency SCR of different entities and its impact on the overall SCR can, however, reveal positive surprises due to netting of currency exposures from different locations and consideration of an imperfect correlation with other market SCRs.
- As a result, it is not necessary to eradicate all foreign currency positions, as the smallest positions have a highly diluted impact on the overall SCR. However, there may be advantages to consolidating major foreign currency positions within an overall currency SCR budget.

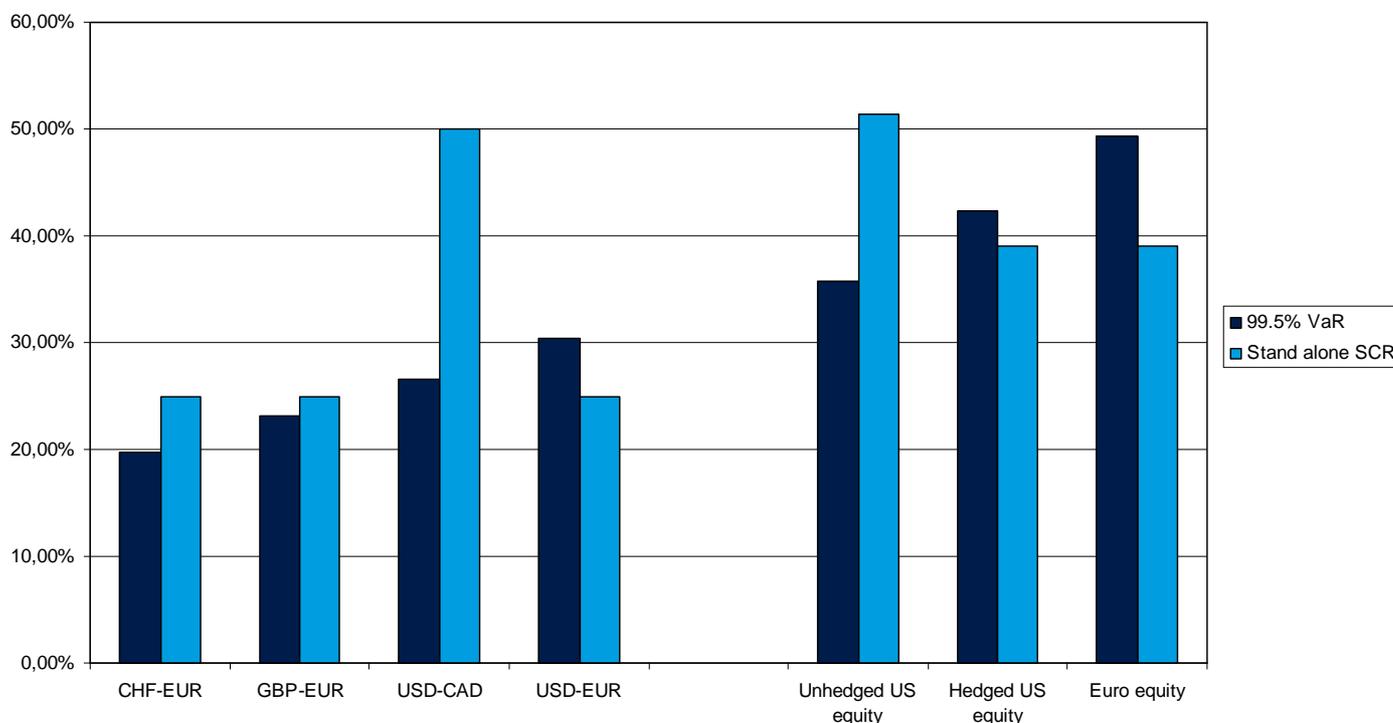
2 Is the treatment of foreign-currency positions severe?

On a stand alone basis, it depends on the foreign-currency positions

Using a few examples, we calculated the SCR of the stand alone position and an annualised VaR at 99.5% confidence level, using volatility at September 30, 2012 observed over the last ten years with a three-year half life.

The graph below shows the results for a number of currency positions, in addition to other assets for a euro based investor.

Comparison of 99.5% VaR and SCR for several currency and other asset positions



For simple foreign-currency positions, the resulting SCR figure is relatively consistent with a volatility-based 99.5% VaR figure. The figure is a little severe for the Swiss franc and the Pound (against the euro) and slightly lenient on the dollar. When comparing with the capital charge applied to currency hedged equities, the treatment applied to currencies is slightly more severe but it should be noted that this is more a case of the equity treatment being somewhat lenient when compared to a 99.5% VaR figure. However, it should also be taken into consideration that the calculation is done using an equity SCR of 39% without taking into account the dampener (the correction to be applied to the 39% figure to take into account a sharp rise or fall in the equity market), and that the capital requirement figures had been defined by the regulator in 2009.

Two particularly atypical situations should be highlighted

The long USD short CAD strategy is treated as severely than what would be consistent with the 99.5% VaR figure. While the correlation between the USD and CAD against euro is positive, the regulator requests that the currency SCR on such a position is calculated with perfectly negative correlation at -1.

The other example is the case of unhedged US equities. In this case, the correlation observed on the markets between the dollar and US equities is negative, but the figure taken into account to aggregate the currency and equity SCRs is 0.5, which results in a much higher capital requirement than the observed 99.5% VaR.

For a simple asset, the capital requirement is therefore consistent with the observed risk. However, as soon as correlations come into play, regulations are obliged to take a simplistic and conservative view, which could be starkly different from the situation observed on the markets. As a result, positions involving several currencies or asset classes could be hit much harder than what a historical observation of currency fluctuations would lead us to believe.

If aggregated, it depends on the insurer's situation

The impact of an additional currency position on the insurer's overall SCR is far from the supposed impact of its currency SCR taken by itself.

Firstly, when there are several areas of the balance sheet exposed to foreign currencies (several foreign subsidiaries or several unhedged asset portfolios), currency netting may occur.

The overall currency SCR is always less than the sum of the currency SCRs of the different buckets but, in order to calculate the precise figure, the upside and downside of the currency SCR for each currency must be known before aggregating. Net exposures to a currency may offset between two buckets sometimes but not other times, making the currency SCR highly volatile.

“ *The overall currency SCR is always less than the sum of the currency SCRs of the different buckets* ”

Furthermore, the impact on the overall SCR of an increase in the currency SCR is not calculated by aggregating the market components but by using the correlations set by the regulator. In the following example, we analyse the market SCR of a life-insurance company with between 7% and 10% equity exposure, a duration gap of around 1.5 and exposure to credit. The initial breakdown of the market SCR components is indicated in the table below (excluding currency effect)

Initial breakdown of market SCR components	
Interest rate SCR	1.5%
Equity SCR	3.0%
Real estate SCR	0.5%
Credit spread SCR	1.0%
Market SCR	5.1%

We then study the effect of adding the currency positions to this base scenario.

	Full hedging	Partial hedging(1) *	Partial hedging(2) *	Partial hedging(3) *
% of balance sheet exposed to currency	0%	1%	5%	10%
Currency SCR	0%	0.25%	1.25%	2.50%
Market SCR	5.1%	5.2%	5.6%	6.3%
Incremental impact of currency SCR	0.0%	0.08%	0.49%	1.20%
Marginal impact of an increase in currency SCR (as a % of the additional currency SCR)	29%	33%	49%	63%

* The levels 1,2 and 3 refer to increasing % exposed to foreign currencies

The currency SCR's incremental impact is significantly diluted in comparison to the currency SCR itself, all the more so given that the initial currency position is small.

The same conclusion is reached when examining the marginal impact of the currency SCR compared to the initial situation. First of all, it is apparent that the figure is well below 100% in all cases. When there is no initial foreign currency position, a small additional foreign currency position increases the market SCR as if only 29% of this position had been exposed to currency. With an initial position of 1% of the balance sheet exposed to foreign currency, the situation is similar for the overall market SCR – it is as if 33% of the position had been taken into account. When the unhedged portion of the balance sheet is greater, i.e. 5% or 10%, the correlations' shock absorbing effect diminishes – currency SCR corresponding to 49% and 63% of the position, respectively, must be added.

3 Considerations for a single-currency liability insurer.

Should an insurer hedge its foreign equity or fixed-income positions?

Clearly, given the lack of an expected return on currency risk, the initial reflex is to consider that positions exposed to foreign currency will generate a zero-reward capital cost and it would be preferable to systematically hedge these positions as they require wasted capital.

However, the impact on the overall market SCR is highly diluted if this currency risk exposure applies to less than 1% of the balance sheet. Furthermore, implementing currency hedging on positions in a large number of currencies can generate operating costs and even counterparty risks, which are not considered here.

“ *The impact on the overall market SCR is highly diluted if the currency risk exposure applies to less than 1% of the balance sheet* ”

As such, we suggest hedging the largest currency exposures, but it would not be useful to rigorously hedge positions against the euro as long as the residual exposure remains below 1% of the balance sheet.

Should an insurer use a tactical currency fund?

Depending on whether or not the fund can short currency positions, the currency SCR may increase from single to double and reach 50% of the amount of investment, with a high level of variability depending on the positions held in the fund. As such, it would be preferable to use such a fund only for a small amount and if the insurer's initial situation outside the fund does not incur substantial currency risk. An alternative is to stipulate that the fund can go long but not short.

4 The case of a multi-currency insurer

An example

The example below involves an insurance company with its parent holding company located in the eurozone and three subsidiaries, located respectively in the eurozone, Sweden and the United Kingdom. All amounts have been converted into millions of euros.

Each subsidiary's liabilities are assumed to be purely domestic.

As for subsidiary's assets, they are made up of domestic bonds and domestic and international equities. The breakdown of assets is indicated in the table below.

	Subsidiary A Based in the eurozone	Subsidiary B Based in Sweden	Subsidiary C Based in the UK
Balance sheet size	60	10	30
% domestic bonds	94%	93%	92%
% equity	6%	7%	8%
Eurozone	3.0%	1%	2%
United Kingdom	1.0%	1.5%	4%
Sweden		2%	
United States	1.0%	1%	1%
Japan	0.5%	1%	0.5%
Other countries	0.5%	0.5%	0.5%

It is then possible to calculate the currency SCR at each subsidiary.

Calculation of subsidiaries' SCR as a % of their respective balance sheets			
	Subsidiary A	Subsidiary B	Subsidiary C
Amount in foreign currencies	3%	6%	6%
o/w other countries	0.5%	0.5%	0.5%
Subsidiaries' currency SCR	0.8%	1.5%	1.5%
o/w other countries SCR	0.1%	0.1%	0.1%

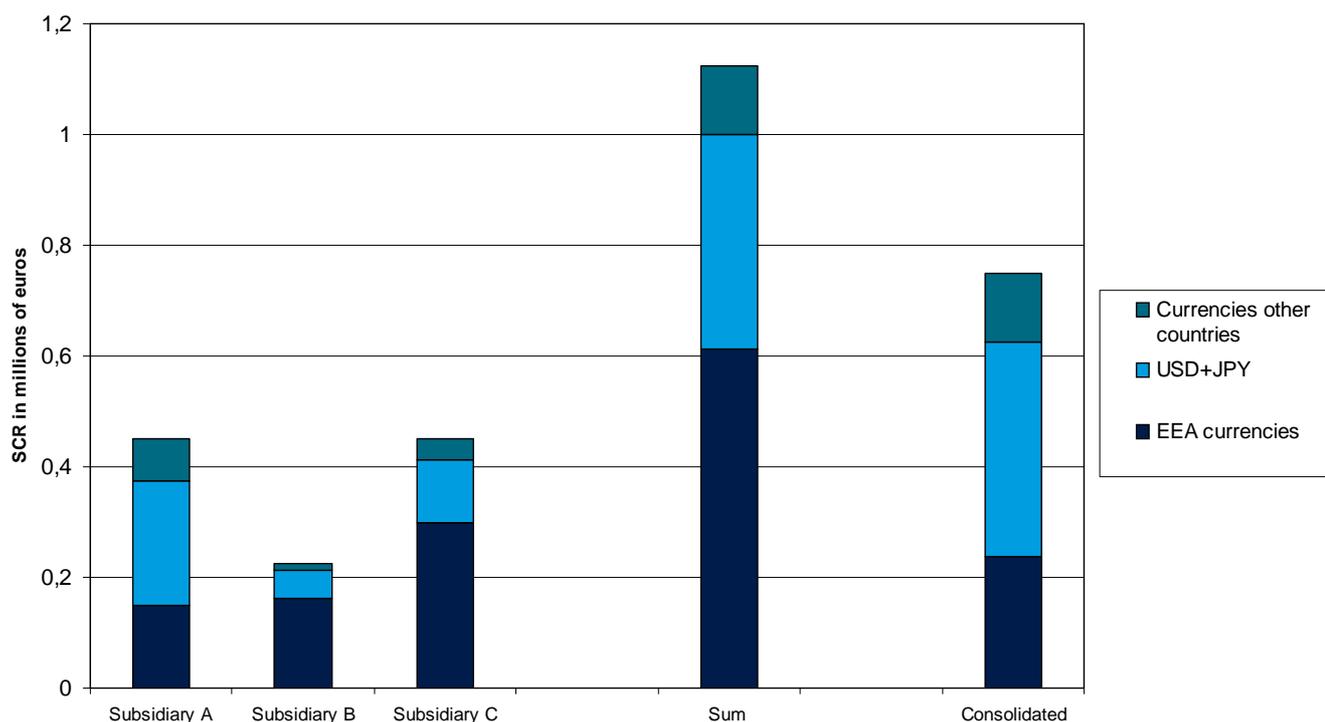
Calculating the parent company's currency SCR requires foreign currency amounts to be consolidated

Net exposures to currencies (in millions euros)				
	Subsidiary A	Subsidiary B	Subsidiary C	Consolidated
Eurozone	-2	0.1	0.6	-1.1
United Kingdom	0.6	0.15	-1	-0.4
Sweden	0	-0.5	0	-0.5
United States	0.6	0.1	0.3	1.0
Japan	0.3	0.1	0.15	0.6
Other countries	0.3	0.05	0.15	0.5
Positions' currency SCR	0.45	0.225	0.45	0.75

Note that, on the euro and the United Kingdom, currency exposures partially offset each other, which is why the consolidated currency SCR is lower than the sum of the currency SCR for subsidiaries' foreign currency positions ($0.45+0.225+0.45=1.125$).

The breakdown of the consolidated currency SCR calculation is illustrated by the following graph.

Breakdown of subsidiaries' contributions to consolidated currency SCR



We note that the netting effect impacts the currency SCR from the European Union (EEA), while on the other currencies entry, and on the USD+JPY entry, the consolidated figure is equal to the sum of the subsidiaries' SCRs.

In the consolidated SCR of 0.75, the majority comes from the positions on subsidiaries' home currencies as well as the USD and JPY. While as in the subsidiaries considered separately, the portion of European currency exposures dominates, the result inverts in favour of the JPY and USD in the consolidated result. The portion of other currencies only represents 0.125 of the SCR for a consolidated balance sheet of 100. This amount corresponds to 0.5% of assets exposed to foreign currencies and is marginal. It does not need to be systematically hedged.

Suggestion

In order to optimise currency management, we suggest:

- leaving small currency positions unhedged at subsidiaries;
- implementing systematic currency hedging between subsidiaries and the parent company on the major currencies;
- implementing, at the parent company level, a centralised currency management bucket, into which the hedges granted by the parent company to the subsidiaries will be included. This bucket will have to optimise the return under a constraint that the currency SCR including the hedges remains lower than 0.25% of the balance sheet.

As such, the consolidated currency SCR will correspond to an equivalent of 1% of assets invested in foreign currencies. In the subsidiaries, most of the currency SCR is also eliminated. This ensures that, both in the subsidiaries and overall, the currency SCR will have only a slight impact on the overall SCR. Furthermore, in the event of fluctuations in foreign currency positions or inaccuracies when sending information between the subsidiaries and the parent company, the impact in terms of currency SCR will be significantly diluted in the overall SCR.

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