

Currency Risk under Solvency II:

The day an accounting treatment hatched into a risk

1. Introduction

Why do we hold SCR for Currency Risk?

The SCR is the capital required to ensure that the (re)insurance company will be able to meet its obligations over the next 12 months (with a probability of at least 99.5%). SCR should therefore serve to provide a capital buffer for any threats to the solvency position.

Any mismatch in currency between assets and liabilities within a legal entity does warrant a currency charge. This is captured in Solvency II QIS 5 specifications and provides generally a sensible approach for legal entities whose liabilities are mostly in one currency. The question this paper focuses on is the extent to which a further currency risk charge is warranted on a Group level when legal entities are in non-EURO jurisdictions. Indeed when summing up the parts (including non-EU based entities), foreign currency movements will have an impact on Group valuations. Currency changes lead to accounting translations that affect amounts reported. However, this does not by itself affect a (re-)insurers' ability to meet its obligations - which would have already been evidenced at solo level.

To get back to basics here, we have asked ourselves the question: How will movements in the currencies of non-EUR denominated entities and business affect our solvency position and hence our ability to meet our obligations?

In this paper we discuss the idea behind currency risk. If the guidance for the required capital calculation for FX risk is based on a shock applied to the Net Asset Value of the entities in their respective reporting currencies, then this can create hedge incentives that endanger the solvency of the group and hence policyholder benefits. We illustrate later in this paper why this is the case. For the Group calculation the QIS4 approach to apply the shock only to the Net Asset Value over the SCR would provide a more appropriate treatment of the FX risk to within the standard formula. However, we believe that the most appropriate treatment of FX risk for multinational Groups is through the usage of an (partial) internal model.

2. Background

In the section G 2.3 “Additional guidance for the calculation of the consolidated group SCR” of the QIS5 Technical Specifications, groups are requested to include in the Group SCR the additional market risk (currency risk) arising from the fact that reporting currency at group level is different to currencies of reporting units consolidated for QIS5. The general idea is that due to movements of the group reporting currency against reporting unit’s currencies the solvency position of the Group might change. However this is a misunderstanding. It is the value of the Group that can change if currency translation risk is not hedged – not the solvency position. This is because so long as assets and liabilities in foreign legal entities are matched in local currency, a currency change relative to the EURO impacts both the assets and liabilities for the foreign legal entity so the local solvency ratio is naturally hedged.

Two basic arguments for holding capital for FX risk only against the economic free capital EFC, i.e. the excess of NAV over SCR, are put forward in this document:

- The QIS 5 treatment, i.e the calculation of FX translation against full NAV, could lead to situations in which a Group as a whole would have negative EFC even though each solo entity would have positive EFC. This of course does not properly reflect the solvency position of the Group as by definition, if each subsidiary is solvent, the Group should be as well.
- The QIS 5 treatment would constitute an incentive for companies to hedge the FX risk against the full NAV. By hedging the full NAV, FX translation risk would be zero. As a consequence, companies risk that they are (substantially) overhedged in periods in which NAV will have declined, which endangers rather than improves the solvency position in crisis periods.

The structure of the paper is such that we will substantiate our arguments by analyzing the position of a hypothetical Group and afterwards describe the specifics which arise for solo entities which write international business.

3. Illustration of Solvency Position and Hedging Incentives

Step 1, Statement of accounts:

An insurance group called “Group FX” has three entities with businesses in three different currencies. The figure below gives an overview of the consolidated solvency position of Group FX. The reporting currency of Group FX is the Euro and the solvency positions of all entities are expressed in Euro as well. Moreover we assume that each entity only has exposure in their local currency¹. In the consolidated solvency position of Group FX it is assumed that there are no diversification benefits between the three different entities. This assumption is not relevant for the arguments in this paper, and is only made to keep the example as simple as possible. Economic Free Capital (EFC) in the table below is the difference between the Net Asset Value and the SCR.

	Japan	US	EU	Group FX
NAV	1200	1200	1200	3600
SCR	1000	1000	1005	3005
EFC	200	200	195	595

Figure 1: Consolidated solvency position of Group FX

Observation 1: Group FX has an EFC of 595 without taking into account the FX translation risk.

Step 2: Now suppose that the JPY and the USD depreciate 25% against the EURO. After the shock the solvency position of each entity in Group FX is as follows:

	Japan	US	EU
NAV	900	900	1200
SCR	750	750	1005
EFC	150	150	195

Figure 2: Consolidated solvency position of Group FX after shock

Observation 2: If an entity has a positive solvency position, a change in the FX rates cannot lead to a situation in which the solvency position becomes negative. An adverse currency shock can only reduce the initial excess capital position when translated to the reporting currency (Euro) but can never lead to a solvency breach.

If each entity has a positive solvency position, the group cannot be insolvent unless additional currency instruments exist on the Group level.

Step 3: Applying a currency risk charge to NAV

Now suppose we calculate the SCR for the FX translation risk at the consolidated level of Group FX based on the Net Asset Value of the JPY and USD entities. Suppose that SCR is a shock of 25% applied to these Net Asset Values. The consolidated solvency position of Group FX is:

¹ Note that we assume that each reporting entity only invests in assets of the same currency of the liabilities. If that were not the case then the reporting entity would draw a currency charge to the extent assets and liabilities where not match in the local currency. This is a simplifying assumption that does not impact the arguments in this paper.

	Japan	US	EU	Group FX SCR	
				Translation risk	Group FX
NAV	1200	1200	1200		3600
SCR	1000	1000	1005	600	3605
EFC	200	200	195		-5

Figure 3: Consolidated solvency position of Group FX including SCR FX translation risk

Observation 3: Even though all entities of Group FX show an ample excess solvency position Group FX has a solvency deficit.

When calculating FX translation risk based on NAV, a Group can have negative EFC even if each subsidiary has positive EFC. This is clearly not reflecting the reality.

Step 4: Group FX decides not to hedge the FX translation risk at the group. Now, the same shock occurs as previously: 25% depreciation of both the JPY and the USD against the Euro. The solvency position of Group FX, now including an SCR – again based on a shock applied to the Net Asset Value of the JPY and USD entities – for this translation risk is as follows:

	Japan	US	EU	Group FX SCR	
				Translation risk	Group FX
NAV	900	900	1200		3600
SCR	750	750	1005	450	2955
EFC	150	150	195		45

Figure 4: Consolidated solvency position of Group FX including SCR for FX translation risk after adverse shocks in the JPY and USD.

Observation 4: Even though Group FX showed a solvency deficit and the board decided not to hedge the FX translation risk, the solvency position of Group FX turned positive in an adverse movement of the JPY and USD.

If the SCR for translation FX risk is measured based on a shock applied to the NAV, then the solvency position of a group at the consolidated level can improve even though the exchange rates in the non-reporting currencies depreciate!

Step 5: Next we will show that when the board is incentivised by the SCR of 600 to hedge the FX translation risk at the group level it becomes dangerous! Suppose that the board of Group FX decides to hedge the FX translation risk in the group by entering into FX swaps (one for the JPY and one for the USD exposure, both with a notional of EUR 1200 equal to the Net Asset Value in the entities). Before any adverse shock in exchange rates, the consolidated solvency position of Group FX, including the swap position, is as follows:

	Japan	US	EU	Group FX		
				translation charge	Swaps	Group FX
NAV	1200	1200	1200			3600
SCR	1000	1000	1005	600	-600	3005
EFC	200	200	195			595

Figure 5: Consolidated solvency position of Group FX including FX swaps

The FX swaps both have a market value of zero at initiation of the contract. The total underlying notional amount is EUR 2400 (EUR 1200 JPY FX swap and EUR 1200 USD FX swap). It is clear that if a 25% shock is applied to the Net Asset Values in JPY and USD, the market value gains in the swaps offset the decrease in the Net Asset Values.

Observation 5: Assuming Solvency II adopts the NAV approach to measure the FX translation risk, Group FX would have no FX translation charge if it decided to hedge NAV.

Step 6: Now, we assume an appreciation scenario of the USD and the JPY: the JPY and the USD appreciate by 40% against the EUR. The consolidated solvency position of the group is now turned into a deficit.

	Japan	US	EU	Group FX translation charge	Swaps	Group FX
NAV	1680	1680	1200		-960	3600
SCR	1400	1400	1005	840	-840	3805
EFC	280	280	195			-205

Figure 6: Consolidated solvency position of Group FX after hedge transaction including SCR for FX translation risk

Observation 6: The consolidated solvency position has turned negative after appreciation even though Group FX hedged the FX translation risk.

In the QIS 5 approach, FX translation risk is zero if a Group hedges NAV. However as the example shows, it is indeed very exposed to FX rate changes as the solvency position of a group can change from a excess position into a deficit.

In the next two examples the SCR for FX-translation risk is based on the EFR, i.e. the excess of NAV over SCR. The base situation is the same as in Figure 1. The Group FX translation SCR is now 25% times (200 + 200), i.e. 100 as shown in the next figure.

	Japan	US	EU	Group FX SCR Translation risk	Group FX
NAV	1200	1200	1200		3600
SCR	1000	1000	1005	100	3105
EFC	200	200	195		495

Figure 7: Consolidated solvency position of Group FX including SCR FX translation risk (EFR approach)

After a 25% depreciation of the USD and the JPY against the EUR the solvency position of the group is as follows:

	Group FX SCR			Translation risk	Group FX
	Japan	US	EU		
NAV	900	900	1200		3000
SCR	750	750	1005	75	2580
EFC	150	150	195		420

Figure 8: Consolidated solvency position of Group FX including SCR FX translation risk after 25% shock in USD and JPY (EFR approach)

When calculating the Group FX risk based on NAV-SCR and if all solo entities are solvent, then the group can never become insolvent due to adverse FX-movements versus the reporting currency of the Group. The QIS 4 approach better reflects the reality of Groups than the QIS 5 approach.

What we do see in Figures 7 and 8 is that the solvency ratio of Group FX is almost constant at 116% (i.e., $3600/3105=116\%$ in Figure 7 and $3000/2580 = 116\%$ in Figure 8)).

In the hedge example it can be shown that if the total underlying amount in the FX swaps is equal to EUR 400 (200 in JPY and 200 in USD), then the EFC of Group FX remains equal after a shock in the USD and/or JPY exchange rate against the EUR.

4. Translation Risk for solo-entities

For solo entities which write business in different currencies the issues are similar. One could decompose the entity's balance sheet into separate balance sheets by currency and construct analogous examples. For example, as we have just seen (Observation 3 above) the entity can secure the policyholder claims in each currency to the required confidence but could not be solvent as a whole if capital for translation risk is set as a percentage of net asset value of the non-reporting currencies. This obviously does not make sense and should be addressed by a refined treatment within an internal model if it is relevant in order not to add undue complexity in the standard formula.

5. Conclusion based on the observations above

The FX translation risk discussed in this paper is a difficult topic especially when a group has many entities also doing business in multiple currencies. We have shown that a simple calculation based on the NAV approach can lead to over hedging that endangers the protection of policyholders. We also showed that for the approach where the group SCR is based on a shock applied to the EFR, i.e. NAV over SCR, that a group can never become insolvent due adverse movements in the reporting units exchange rate against the exchange rate of the group if the underlying businesses are solvent. It is acknowledged that the value of the group can change due to changes in the reporting units' exchanges rates – but this is not a solvency issue. In this case a Group can decide in the internal model how to treat this risk and discuss their currency strategy with their group supervisor as part of the Pillar II process. For Standard Model users, for practical reasons we propose to use the EFC-method (apply shock to NAV over SCR for the reporting units not reporting in the reporting currency of the group) in the calculation of the Group SCR.

Appendix: Relevant references to QIS 5 Specifications and Draft Level 2 Implementing Measures

G.48 in Section G 2.3: “Currency risk at group level needs to take into account the currency towards the currency of the group’s consolidated accounts. Therefore, the local currency referred to in the currency risk calculations of the standard formula is the currency used for the preparation of the group’s consolidated financial statements.”

Draft Level 2 Implementing Measures

Articles 324 SCG4: “Where the consolidated group Solvency Capital Requirement is calculated, wholly or in part, on the basis of the standard formula, the local currency as referred to in the currency calculation under the standard formula shall be understood as the currency used for the preparation of the consolidated accounts.”

Although both the articles in the QIS5 specifications and in the Draft Level 2 Implementing Measures lack some clarity of intent, they suggest instructions to measure an additional charge for currency risk by applying a currency shock in the consolidated accounts the Net Asset Values of the entities in the non-reporting currencies.