

Annuity Reinsurance

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2. List of Abbreviations

BEL, best estimate of liability

Cedant, the life assurance company that wrote the annuity business

CEIOPS, Committee of European Insurance and Occupational Pension Supervisors

CSA, Credit Support Annex

ECAI, External Credit Assessment Institution registered or certified in accordance with Regulation (EC) No 1060/2009

EIOPA, European Insurance and Occupational Pensions Authority

ESG, Environmental, Social, and Governance

FCA Regulations, European Communities (Financial Collateral Arrangements) Regulations 2010

IFRS, International Financial Reporting Standards

ISDA, International Swaps Derivatives Association

ISIN, International Securities Identification Number

SCR, solvency capital requirement for a particular module such as the market risk module which is calculated before diversification and gross of any loss absorbing effects

Solvency II Directive, Directive 2009/138/EC

SEDOL, Stock Exchange Daily Official List

SPIRE, Single Platform Investment Repackaging Entity SA

SPV, Special Purpose Vehicle

WARF, weighted average risk factor

Any reference to an article of legislation in this paper is to the corresponding article in Commission Delegated Regulation (EU) 2015/35 as amended by Commission Delegated Regulation (EU) 2015/35.

3. Introduction

The paper examines the reinsurance of individual annuities in payment almost entirely from the point of view of the Cedant. It assumes that the Cedant is reinsuring a block of annuities in its existing portfolio, let's say 25% of the annuities in payment, and retaining the remaining 75% of the annuities in payment ('Residual Annuities').

There are many possible motivations for a Cedant to enter into an annuity reinsurance agreement with a reinsurer including but not limited to:

- (i) reduce the Cedant's longevity risk;
- (ii) reduce the Cedant's investment risk;
- (iii) increase the Cedant's solvency capital cover; and
- (iv) generate an IFRS profit for the Cedant in a particular accounting period.

Some annuity reinsurance agreements may embody all four of the above motivations.

The size of any increase in IFRS profit and size of the increase in the Cedant's solvency capital cover will depend in part on the yield and SCR charge associated with the group of bonds sold or transferred in payment of the reinsurance premium. The potential for IFRS profit arises from the following components:

[IFRS reserve released as a result of reinsuring a block of annuities]

PLUS:

the [Reduction in IFRS reserve for Residual Annuity liabilities as a result of using the assets in the Cedant's annuity portfolio with the lower risk-adjusted yields to pay the reinsurance premium leaving higher risk-adjusted yielding assets behind to discount the Residual Annuity liabilities]

MINUS:

the [Reinsurance Premium paid].

For any given reinsurance deal, the first and the third items are essentially fixed. Thus, a key issue in the generation of IFRS profit is the choice of bonds to sell or transfer in payment of the reinsurance premium. For a portfolio transfer¹, the premium to be paid for the transfer will be significantly greater than the reinsurance premium for the same block of annuities and is thus likely to wipe out much of the IFRS profit.

3.1 Reinsurance – Cost Issues

Entering into a reinsurance agreement is not without costs. Costs include the legal fees to

¹ Directive 2002/83/EC, the Consolidated Life Directive, provides for the transfer of all or part of a portfolio of life assurance business from one life assurance company to another.

ensure effective risk transfer for Solvency II purposes, the management time in negotiating the agreement, and the ongoing costs of monitoring the credit exposure to the reinsurer and administering the agreement for a period of 30 years or more. This latter cost arises from: (a) the requirement to monitor the collateral posted by the reinsurer and compare it with the reinsurer's liability under the agreement; (b) the possible need to order collateral top ups from time to time; (c) the need to review and, if thought appropriate, agree to collateral substitutions; and (d) the need to segregate the administration of annuities in payment into those which are reinsured and for which reinsurance recoveries are applicable and those that are not.

To justify these costs, the premium paid by the Cedant to the reinsurer must therefore be above a certain minimum amount. It is unlikely that a premium of less than EUR250m would justify such initial and ongoing costs.

3.2 Reinsurance – Skills and Time Scales

Negotiating a reinsurance contract requires a team of people with a range of skills including actuarial, administration, legal, IFRS accounting, solvency capital management, investment management, IT automation, and data science. A typical annuity reinsurance contract might take between four and six months to negotiate.

3.3 Reinsurance Premium

The premium that a reinsurer will charge the Cedant may be expressed as a swap curve plus or minus a fixed number of basis points. The swap curve is then used to discount the expected payments under the block of annuities reinsured to arrive at the reinsurance premium. The expected payments will be determined by the mortality basis including assumptions regarding future improvements in mortality. The swap curve, the basis points addition to or subtraction from the swap curve, and the mortality basis will be a critical to the determination of the reinsurance premium. Where the Cedant's number of deaths of annuitants is sufficiently large, the mortality basis is likely to be based on the experience of the Cedant with the mortality improvement assumption negotiated between the Cedant and the reinsurer. The fixed number of basis points will vary with several factors in particular the investment guidelines for eligible collateral. If the investment guidelines for eligible collateral specify high credit quality, liquid assets, the reinsurance premium will increase assuming all other factors remaining constant.

3.4 Reinsurance Premium Versus Reserves

The premium that the reinsurer will charge the Cedant relative to the release of reserves for the block of annuities on both a Solvency II balance sheet basis and an IFRS accounting basis will be a key financial metric in determining the attractiveness of a proposed reinsurance arrangement

4. Assumptions

In this paper, the authors assume the life assurance company is:

- (i) incorporated and regulated in Ireland;
- (ii) calculates its solvency capital requirement using the standard formula;
- (iii) reports profits under IFRS accounting;
- (iv) is reinsuring a portion of its existing book of individual annuities in payment thus, no deferred annuities are being reinsured;
- (v) the transfer of risk from the life assurance company that wrote the annuity business (the 'Cedant') to the reinsurer is by means of a reinsurance agreement documented under the laws of Ireland;
- (vi) the reinsurance arrangement does not involve the establishment of a special purpose vehicle or the purchase or issuance of financial instruments;
- (vii) the currency of denomination of the annuity payments is the euro; and
- (viii) the annuities have level payments or the payments escalate at a fixed rate; there are no annuities that increase in line with inflation, the reason being that for a reinsurer, Irish inflation is very difficult to hedge.

5. Nature of Annuity Reinsurance

In essence, annuity reinsurance involves the Cedant swapping longevity and investment risk for legal, credit, and operational risk. At its heart, it is a form of regulatory arbitrage as the reinsurer must be able to discount the liabilities at a higher rate of interest or hold a lower level of regulatory capital in respect of the block of business reinsured by the Cedant either on its own account or through one or more retrocessions. The higher rate of interest may come from investing in illiquid assets which provide an illiquidity premium.

Reinsuring a block of annuities with another Solvency II regulated insurance undertaking is unlikely to provide the increase the solvency cover or generate any significant IFRS profit for the Cedant unless that reinsurer can in turn reinsure the block of business to another entity outside the Solvency II regulatory regime.

The Cedant will wish to ensure that, absent insolvency of the reinsurer, the reinsurance arrangement may not be unwound by the reinsurer. If the Cedant has to re-inherit the annuity liabilities, in addition to setting up the reserves for the re-inherited liabilities, the Cedant will need sufficient capital for the SCR and the risk margin associated with the re-inherited liabilities. Further, where the Cedant has a policy of maintaining an excess of solvency cover over the minimum required, such as 140% cover, additional capital will be required. The unwinding of the reinsurance contract may also occur at a time when the Cedant's access to capital is limited and its capital position is such that re-inheriting the annuity liabilities causes a significant drop in solvency cover.

5.1 Term of Reinsurance Agreement

Absent termination of the agreement by the Cedant or the reinsurer, the term of an annuity reinsurance agreement will extend until the death of the last surviving annuitant. The reinsurance agreement may provide for either party to terminate the agreement before such death when the present value of future payments to a specified minimum number of annuitants under the agreement falls below a threshold value. Depending on the annuity-size-weighted average age of the block of annuities reinsured, the term of an annuity reinsurance arrangement may extend well beyond 30 years.

6. Advantages and Disadvantages of Annuity Reinsurance

6.1 Advantages of Annuity Reinsurance

If the Cedant were to transfer the block of annuity policies to another Solvency II regulated insurance undertaking, it would reduce the Cedant's longevity risk and investment risk without the need for ongoing monitoring of credit risk, collateral management, and the administration and payment of annuities for the block of annuity policies transferred. In the case where the transferee insurance undertaking could gain some SCR diversification benefit from assuming longevity and investment risk, there may be a small benefit to the transferor insurance undertaking relative to the price paid for the transfer. Such a transfer is likely to be very costly as it would require considerable interaction with the Cedant's regulator, court approval, an opinion from an independent actuary, and correspondence with all of the annuitants whose payments are to be transferred. Not only would such a transfer be costly, but there would be a long lead time from conception of the idea to execution.

By contrast, annuity reinsurance may provide a once-off release of IFRS profit and/or a reduction in solvency capital requirement before diversification and gross of any loss absorbing effects ('SCR'). Using reinsurance, a Cedant can reduce both the absolute level of investment and longevity risks, reduce the concentration of such risks in its portfolio, stabilise its solvency by reducing its exposure to unexpected changes in life expectancy and spread risk, and expand underwriting capacity. Further, compared with the case where the Cedant were to transfer the block of annuity policies to another Solvency II regulated insurance undertaking, the Cedant is not exposed to the potential reputational damage arising from having transferred a block of annuity business to another insurance undertaking which subsequently became insolvent and unable to pay annuitants the full amount due under their policies.

Reinsurance will give rise to a reduction in the Cedant's longevity risk SCR and the Cedant's Spread Risk SCR is also likely to be reduced. However, the SCR reduction will not be as large as it would be for a transfer of the same block of annuity policies because of the Solvency II requirement in the case of reinsurance to set up a counterparty default risk SCR and the associated market risk SCR arising on any collateral posted to reduce counterparty risk.

Under a reinsurance deal 'own funds' are likely to increase because the sum of the release of:

[The Risk Margin due to the reduction in longevity risk]

[The reserve for investment management expenses arising from the sale or

transfer of assets in the annuity portfolio to the reinsurer²]

LESS

the excess of the [reinsurance premium paid] over the [reinsurance asset on a Solvency II basis].

To summarise, an annuity reinsurance deal is capable of increasing own funds and reducing the in SCR, leading to an improvement in the solvency cover ratio.

6.2 Disadvantages of Reinsurance

Compared with the case where the Cedant were to transfer the block of annuity policies to another Solvency II regulated insurance undertaking, while reinsurance may reduce the longevity and investment risks of the Cedant, it may result in the Cedant passing potential mortality and investment profit to the reinsurer.

Reinsurance also introduces operational risk and expense for the Cedant in the form of the ongoing administration of the reinsurance agreement, monitoring the credit risk in the arrangement, and reporting to the reinsurer for periods of perhaps 30 or more years.

² This release is diminished somewhat by the allowance for the reserve for ongoing expense of monitoring the reinsurance arrangement.

7. Governance Issues

7.1 Central Bank

Depending on the significance of the annuity reinsurance arrangement for the Cedant and the Central Bank PRISMTM rating³ of the Cedant, it may be appropriate to brief the Central Bank on the reinsurance arrangement.

7.2 Committees of the Cedant

For good governance purposes, it is likely that a paper on the proposed reinsurance agreement covering such issues as the deal's key financial metrics, the financial strength of the reinsurer, and the management of credit and operational risk would be presented to the asset-liability management committee and executive management committee of the Cedant for challenge and, if thought fit, approval. The accompanying paper ought to contain an opinion on the deal from the Chief Risk Officer of the Cedant.

7.3 Cedant's Shareholder

The Cedant's shareholder may also require a similar paper to that described in paragraph 7.2 on the proposed reinsurance agreement again accompanied by an opinion on the deal from the Chief Risk Officer of the Cedant.

7.4 Legal

The Cedant is likely to seek a legal opinion from external counsel specialising in annuity reinsurance as to whether the reinsurance arrangement qualifies as a Risk Mitigation Technique under Articles 209 to 215 of Commission Delegated Regulation (EU) 2015/35 and a senior counsel opinion on whether the security created by the security agreement, in essence the Cedant's possession and control of the pool of assets posted by the reinsurer as collateral, qualifies for the protections afforded under the European Communities (Financial Collateral Arrangements) Regulations 2010 (the "FCA Regulations"). The protections offered by the FCA Regulations ensure that the Cedant can appropriate the assets in the custody account upon the default of the reinsurer and avoid a range of local corporate law insolvency provisions which might otherwise delay or frustrate the appropriation of the assets in the custody account.

7.5 Board of Cedant

A paper on the proposed reinsurance agreement should be submitted to the board of the Cedant for consideration and, if thought fit, approval.

³ PRISMTM is the Central Bank's risk-based framework for the supervision of regulated firms.

8. Regulatory Requirements for Effective Risk Transfer

8.1 Solvency II Delegated Regulation – Risk Mitigation Techniques

For a Cedant to gain an improvement in its solvency cover ratio, a reinsurance agreement must effectively transfer the relevant risks, principally spread risk and longevity risk to the reinsurer. To effectively transfer the relevant risks, the reinsurance agreement must qualify as a ‘risk mitigation technique’ under Articles 209 to 215. A reinsurance agreement which qualifies as a ‘risk mitigation technique’ can reduce the basic solvency capital requirement under Article 101 of Directive 2009/138/EC.

Appendix A sets out the requirements of each of Articles 209 through to Article 215 and provides a comment on how the requirement might be met from a practical perspective. We set out below a high-level overview of the requirements of Articles 209 through to Article 215.

8.2 Overview of Articles 209 through to Article 215

Broadly speaking, the main requirements of Articles 209 through to Article 215 for a reinsurance agreement to qualify for ‘effective risk transfer’ under the Solvency II Regulation, are as follows:

1. The contractual arrangements and transfer of risk are legally effective and enforceable in all relevant jurisdictions.
2. There are no conditions in the reinsurance agreement which could undermine the effectiveness of the transfer of risk, or which are outside the control of the Cedant. Further, there are no connected transactions which could undermine the effective transfer of risk.
3. The Cedant must monitor the effectiveness of the arrangement and the related risks on an ongoing basis.
4. The Cedant must have a ‘direct claim’ on the reinsurer in the event of default, insolvency, or bankruptcy of the reinsurer.
5. No double counting in own funds or the calculation for SCR of the risk mitigating effects of a transfer of risk under the reinsurance arrangement.
6. The contractual arrangements governing the risk-mitigation technique shall ensure that the extent of the cover provided by the risk-mitigation technique and the transfer of risk is clearly defined and incontrovertible.
7. There should be no other risks, unless they are reflected in the calculation of the SCR, that would lead to a misstatement of the risk-mitigating effect on the Cedant’s basic solvency capital requirement that could influence the decision-making or judgement of the intended user of the information.
8. Only reinsurers that meet certain regulatory or credit quality standards may be used if the agreement is to qualify as a ‘risk mitigation technique’.

9. For collateral arrangements to be recognised as a ‘risk mitigation technique’, the Cedant must have the right to liquidate the assets in the collateral account upon the insolvency of the reinsurer. The Cedant must have both ‘possession’ and ‘control’ of the collateral account and the collateral must be of sufficient credit quality, sufficient liquidity, and sufficiently stable in value or guaranteed by certain types of counterparties.
10. Assets in the collateral portfolio must be segregated from the assets of the custodian and the custodian’s credit rating must be at least investment grade. The segregated assets may not be used to pay, or to provide collateral in favour of any person other than the Cedant or as directed by the Cedant.
11. There must be no material positive correlation between the credit quality of the counterparty and the value of the collateral.

8.3 Compliance with CEIOPS’s five principles

The Committee of European Insurance and Occupational Pension Supervisors (‘CEIOPS’) was the predecessor of the European Insurance and Occupational Pensions Authority (‘EIOPA’). In guidance issued in 2009, CEIOPS identified five principles for the recognition of risk mitigation techniques under the Level 2 Solvency II implementing measures.

8.3.1 Principle 1: Effective Risk Transfer

The risk mitigation technique shall effectively transfer risk from the Cedant. The Cedant needs to be able to show the extent to which there is an effective transfer of risk in order to ensure that any reduction in SCR or increase in available capital resulting from its reinsurance arrangements is commensurate with the change in risk to which the Cedant is exposed.

8.3.2 Principle 2: Economic Effect over Legal Form

The economic effect of the transaction shall be considered over the legal form. Reinsurance risk mitigation techniques shall be recognised and treated equally, regardless of their legal form or accounting treatment, provided that their economic or legal features meet the requirements for such recognition.

8.3.3 Principle 3: Legal certainty, effectiveness, and enforceability

The reinsurance contracts used to provide the risk mitigation together with the action and steps taken, and procedures and policies implemented by the Cedant, shall be such as to result in risk mitigation arrangements which are legally effective and enforceable in all relevant jurisdictions.

8.3.4 Principle 4: Valuation

The design of the standard SCR calculation shall recognise reinsurance risk mitigation techniques in such a way that there is no double counting of risk mitigation effects.

8.3.5 Principle 5: Credit Quality of the Provider of the Reinsurance Risk Mitigation Instrument

Undertakings shall consider the credit quality of the providers of reinsurance risk mitigation contractual arrangements and shall only take into account effective risk transfer having regard to the credit quality.

8.4 Compliance with Central Bank of Ireland Guidelines

The Central Bank of Ireland *Guidelines on the Reinsurance Cover of Primary Insurers and the Security of their Reinsurers* (the 'Guidelines') were rescinded for Solvency II firms with effect from 14 September 2020.

Although the Guidelines no longer apply, they are useful as a guide to a Cedant in choosing a reinsurer and managing reinsurance contracts. In terms of documentation of a reinsurance contract, the Guidelines provided for four important clauses. Interpreting the Guidelines in the context of annuity reinsurance, the four important clauses may be broadly stated as follows:

8.4.1 Insolvency of the Cedant

The reinsurance agreement ought to contain a clause which requires the reinsurer to perform its contractual obligation 'without diminution' if the Cedant becomes insolvent. In essence, such a clause should provide that following the insolvency of the Cedant, the reinsurer's payment obligations should continue 'without diminution'.

8.4.2 Entire Agreement

The reinsurance agreement ought to contain a clause stating that the reinsurance agreement is the entire agreement between the parties. Article 210(4)(b) is designed to ensure that there are no master agreements or other arrangements linking the reinsurance agreement in question to other agreements with the reinsurer.

8.4.3 Payment without Delay

The reinsurance agreement ought to contain a clause requiring that reinsurance recoveries be paid to the Cedant without delay and in a manner consistent with the orderly payment of claims by the Cedant.

8.4.4 Reporting Obligation

The reinsurance agreement ought to contain a clause providing for reports covering premiums and claims at a frequency of at least quarterly.

8.5 Solvency II Benefits and Collateral Issues

The SCR benefits of a reinsurance agreement that qualifies as a 'risk mitigation technique' under Articles 209 to 215 are a reduction in the SCR charges for interest rate risk, spread risk, and longevity risk on the assets backing the portfolio of annuities reinsured.

The SCR drawbacks of a reinsurance agreement are a requirement for a counterparty default SCR charge to be set up in recognition of the credit exposure to the reinsurer. A reinsurance contract qualifying as a risk-mitigation technique is treated as a Type 1 exposure for the purpose of the counterparty default risk module. The counterparty default SCR can be partially although not fully reduced by the collateral posted⁴. However, while the collateral posted introduces a market risk SCR charge, the correlation between market risk SCR and counterparty default risk SCR is just 0.25.

⁴ Article 112 provides for a simplified calculation of the 'risk adjusted' value of collateral reducing it to 85% of the value of the assets held as collateral or 75% of the collateral posted depending on whether certain combinations of conditions in Articles 88, 197, and 214 are met or not met.

9. Choosing the Block of Policies to Reinsure

In order to avoid selection against the reinsurer by the Cedant and for administrative simplicity, the reinsurer will wish to ensure that the block of policies to be reinsured is a representative subset of the Cedant's existing block of business. The characteristics of the block of policies to be reinsured and the block of policies remaining on the Cedant's books may be compared for this purpose using parameters such as unweighted average age for each gender, average age weighted by annuity payment for each gender, average annual annuity payment for each gender, and distribution of annuities by new business years.

If the Cedant writes impaired annuities, these may be excluded from the block of business to be reinsured if the number and monetary sum of such annuities are small relative to the existing block of business; if that is not the case, the reinsurer is likely to supplement the above characteristics of the book of business with a range of underwriting conditions.

10. Assessing the Potential Solvency II and IFRS Benefits

In addition to the reduction in the solvency capital requirement arising from the reduction in longevity exposure, using corporate bonds to pay the premium will also cause a reduction in the SCR by reducing the SCR for spread risk as these bonds will no longer be a part of the portfolio backing the Cedant's annuity liabilities. The Cedant could also improve the IFRS operating profit by transferring some of its negative-yielding or very low-yielding bonds to pay the reinsurance premium.

Higher-yielding corporate bonds tend to have a lower credit rating and therefore a higher SCR charge whereas negative-yielding bonds tend to be government bonds of high credit quality carrying no SCR charge. There is therefore a trade-off to be considered in terms of choosing a block of bonds with which to pay the reinsurance premium: (i) transferring higher-yielding bonds will tend to reduce the SCR charge and improve the solvency ratio, but this could trigger a reduction in the release of IFRS reserves for the annuity liabilities not reinsured; and (ii) transferring negative-yielding bonds will tend to improve the release of IFRS reserves for the annuity liabilities not reinsured⁵ but may do little to reduce the SCR charge.

10.1 Choosing the Subset of Bonds to be Ceded

10.1.1 Deterministic Approach

If all that the Cedant requires is to generate an IFRS profit with little or no regard for an improvement in solvency cover, one can take a deterministic approach to the problem of choosing the subset of bonds to be used to pay the reinsurance premium. By simply choosing the lowest-yielding bonds and using these to pay the reinsurance premium either in cash or *in specie*, the formula:

$$[\text{Release in IFRS reserves on ceded policies}] - [\text{reinsurance premium paid}] + [\text{the reduction in IFRS reserve based on the higher risk-adjusted yield on the remaining bonds backing the remaining annuity liabilities}]$$

should provide an uplift in IFRS profit. However there is unlikely to be much of a change in solvency capital requirement, as these bonds would tend to be sovereign in nature.

10.1.2 Simulation Approach

If, however, it is desired to optimise both IFRS profit uplift and increase the solvency cover ratio, then a more finessed approach is required to select the bonds to pay the reinsurance premium. To pay the reinsurance premium, a portfolio of securities should be chosen that: (i) is an optimal mix of improvement in the solvency cover ratio and an increase in IFRS profit; (ii) reasonably matches the duration of the ceded liabilities; and (iii) reduces the carbon

⁵ All other things being equal, if the yield on the securities backing the balance of the annuity portfolio after the reinsurance agreement is completed is higher than it was before the reinsurance agreement was completed, an IFRS operating profit will emerge from discounting the residual annuity liabilities of the Cedant at a higher rate of interest.

intensity metric of the Cedant's portfolio.

Trying to choose such an optimum portfolio of securities manually is very difficult. To illustrate the issue, consider the following scenario:

- The Cedant has a portfolio of, say, 80 bonds that are acceptable to the reinsurer in terms of such criteria as credit risk rating, currency, residual term to maturity, and environmental, social, and governance ('ESG') metrics.
- The average value of a holding is €15m with most between €12m and €18m.
- The Cedant wants to cede a portfolio of bonds worth approximately €250m.
- An analysis of the number of bonds required to make up a portfolio valued at say, EUR250m, shows that the Ceded portfolio would need to contain somewhere between 12 and 17 bonds.
- There is therefore between $\binom{80}{12}$ and $\binom{80}{17}$ subsets of the 80 bonds most of which will generate a portfolio valued at EUR250.
- $\binom{80}{12}$ and $\binom{80}{17}$ are numbers of the order of between 10^{13} and 10^{17} .
- Using an i7 PC to draw one million random samples of bonds where each random sample generates a portfolio valued at or above EUR250m will take approximately four hours to run if split into four parallel jobs of 250,000 random samples.
- To cover all combinations would take between 10^7 and 10^{11} times longer. In effect, thousands of years of computing time without some very significant parallelisation.

One solution to the problem is to start by taking one million random samples of groups of bonds each of which will generate a portfolio valued at or above EUR250m.

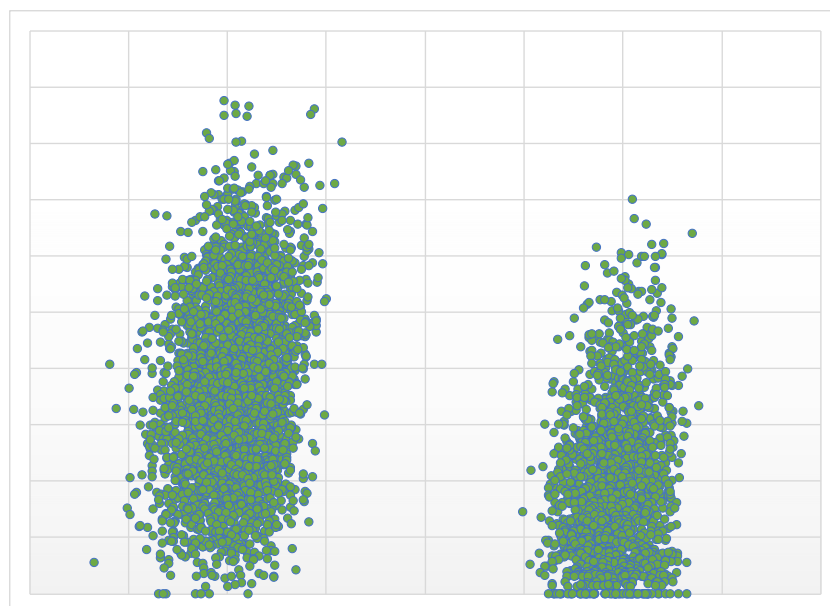
The pseudocode for such a selection process might look as follows:

- Load the set of bonds into memory
- Zeroise the [total value of bonds chosen] counter
- Create an empty array to hold the random sample of bonds selected, the ceded array
- Begin looping:
 - Pick a random number between 1 and the size of the bond array, 80 in our example
 - Move this bond from the original array to the ceded array
 - Reduce the size of the original array by one
 - Add the value of the bond selected at random to the [total value of bonds chosen] counter
 - While the [total value of bonds chosen counter] <= [the €250m premium], repeat the loop
- Once a set of bonds whose value exceeds the premium is achieved, store the following in a database:

- A list of identifiers of each bond chosen (ISIN, SEDOL etc.)⁶
- Summary statistics for this bond set:
 - total value of the ceded portfolio
 - the total solvency charge for the bonds in the portfolio
 - market-value-weighted duration of the ceded portfolio
 - market-value-weighted yield of the ceded portfolio
- Repeat from the top for a total of 1,000,000 iterations.

Each of the resulting 1,000,000 random selections, will all have a value of *at least* €250m which is the required premium. If a bond with a very large value was chosen as the last bond in a random selection when the previous total was just below the premium being targeted, it is possible that some of the random selections could be quite a bit over the desired €250m premium. In order to filter the 1,000,000 random selections of bonds down to a manageable set of data for human inspection, it will be necessary to choose those random selections where: (i) the total value of the portfolio is between the desired premium of €250m and say, €252m; and (ii) the market-value-weighted duration of the randomly selected portfolio lies in a narrow interval centred on the duration of the liabilities. This is straightforward to do with the filtering mechanism of whatever storage medium is chosen by, for example, using a SQL statement against the database. The next step is to graph this reduced set of data; the two axes of the graph are the yield of the ceded portfolio expressed in basis points on the horizontal axis and the SCR charge of the ceded portfolio in € (000,000) on the vertical axis. Chart 1 below illustrates the type of output obtained.

Chart 1



⁶ SEDOL, Stock Exchange Daily Official List. A list of security identifiers used in the United Kingdom and Ireland for clearing purposes. ISIN, International Securities Identification Number.

It is typical to observe clusters of portfolios such as shown in Chart 1 above. There can be portfolios selected that have no solvency charge, such as those consisting entirely of sovereign bonds so there will be some portfolios that lie along the horizontal axis.

The top left quadrant would tend to be where the ideal candidates may come from, as these are those with the higher reductions in SCR and are also the lowest-yielding.

10.2 Quantifying the Benefits in Chart 1

There are two benefits to be examined here:

- I. The change in the solvency coverage arising from any saving in SCR charge. This will be driven by the following factors:
 - a. There will be a modest increase in own funds arising from the sum of:
 - [the release in the Risk Margin due to the reduction in longevity risk] *plus*
 - [the release in the reserve for investment management expenses arising from the sale or transfer of assets in the annuity portfolio to the reinsurer⁷] *minus*
 - [the excess of the reinsurance premium paid over the reinsurance asset on a SII basis].
 - b. There will be a reduction in the solvency capital requirement as the following will have changed:
 - i. Spread risk charges on ceded corporate bonds will decrease
 - ii. Longevity capital requirement for the ceded policies will decrease
 - iii. Counterparty default risk for the reinsurer will increase

The combined effect of the above changes after considering the Solvency II SCR diversification benefits is likely to increase the solvency cover ratio.

- II. IFRS Profit – This is driven by two factors:
 - a. The release of reserves allowed by the increase in risk-adjusted yield on the retained portfolio of securities matching the retained annuity liabilities
 - b. The net effect of the release in reserves from ceding the block of business minus the premium paid to the reinsurer

Usually, a number of portfolios will provide the required level of increase in solvency cover and increase in IFRS profit. Each of these may be further examined to identify the portfolio which gives the greatest reduction in the Cedant's carbon intensity metric.

⁷ This release is diminished somewhat by the allowance for the reserve for ongoing expense of monitoring the reinsurance arrangement.

11. Credit Risk

11.1 Potential Credit Exposure

Potential credit exposure is the credit exposure of the Cedant to the reinsurer on a future date based on a specified confidence interval derived from a model such as a Monte Carlo model. For example, the Cedant may be 99.5% confident that its potential exposure to the reinsurer in say, 5 years' time, will not exceed say, EUR2.0m. Put another way, 5-years into the future, the Cedant is 99.5% confident that a default by the reinsurer at that time will expose the Cedant to a credit loss of EUR2.0 million or less.

Annuity reinsurance is a swapping of investment and longevity risk for credit risk, legal risk, and operational risk and requires the Cedant to monitor, administer, and report on the arrangement. The most significant of these risks is likely to be credit risk. The posting of collateral by the reinsurer to the Cedant may at first glance seem to largely eliminate the credit exposure of the Cedant to the reinsurer. However, a number of factors affect the potential exposure of the Cedant to the reinsurer during the term of the reinsurance agreement. These arise from: (i) changes in longevity assumptions; (ii) the difference between the discount rate used to compute the reinsurance agreement best estimate of liability ('BEL') and hence collateral posted and the Solvency II BEL at the time of any potential liquidation of the reinsurer; and (iii) what we shall call 'basis risk'⁸.

11.1.1 Basis Risk

The basis on which the amount of collateral posted is determined is central to the determination of the potential credit exposure that the Cedant has to the reinsurer over the life of the reinsurance arrangement. To illustrate the point, let's consider two bases for the determination of the amount of collateral to be posted under a reinsurance agreement:

- (i) Reinsurance agreement BEL is determined using the market-value-and-duration-weighted yield on the assets posted as collateral ('Collateral-based BEL');
- (ii) Reinsurance agreement BEL is determined in the same manner as the Solvency II best estimate of liability ('S_{II} BEL').

Under the Collateral-based BEL, the reinsurer would initially post 100% of the reinsurance premium as collateral. If the spreads on the bonds posted as collateral were to widen significantly during the lifetime of the reinsurance agreement, the value of the bonds in the collateral portfolio would fall, and the Collateral-based BEL would also fall because the liabilities would then be valued using the higher market-value-and-duration-weighted yield on the collateral portfolio. In such a scenario, the BEL under the Solvency II standard formula

⁸ This concept of 'basis risk' is different to the term 'basis risk' is defined in Article 1(25) and discussed in sections 18.10 and 18.11 of the paper.

may fall but probably not more than a one or two percentage points of its pre-spread-widening value. It is conceivable that the value of the Collateral-based BEL could fall in value by at least 20% of its pre-spread-widening value. If the reinsurer were to default while spreads remained in that widened state, the credit exposure is likely to be of the order of 20% of the Solvency II standard formula BEL that the Cedant would have to set up upon recapture of the annuity liabilities from the reinsurer. While the Cedant could pursue the liquidator of the reinsurer for such a loss, the Cedant would rank with the general body of creditors and have a very low priority for payment and potential for recovery in such a liquidation.

By contrast, if the basis on which the amount of collateral posted is determined is the S_{II} BEL and if the spreads on the bonds posted as collateral were to widen significantly during the lifetime of the reinsurance agreement, the value of the bonds in the collateral portfolio would fall but, on the S_{II} BEL, the collateral portfolio would have to be topped up to the Cedant's Solvency II BEL.

The potential credit exposure under the Collateral-based BEL is significantly greater than on the S_{II} BEL. The latter collateral basis is very difficult to negotiate with reinsurers and will ultimately affect: (i) the reinsurance premium; (ii) the specification of the eligible collateral assets to be posted to the collateral portfolio, or (iii) a combination of both.

11.1.2 Change in Longevity Assumptions

If an annuity reinsurer were to fail, it is possible that such an event might be accompanied by an increase in longevity risk. In assessing potential credit exposure, it would be prudent for the Cedant to allow for an increase in its Solvency II BEL for the remaining reinsured annuities upon recapture. Such an allowance might be of the order of 5% to 10% of such liabilities recaptured.

11.1.3 Change in Discount Rates

Where the Collateral-based BEL is used to determine the required amount of collateral, it may be prudent to consider a further potential exposure in the range of 8% to 12% of the Collateral-based BEL to allow for differences between the discount rate used to determine the Collateral-based BEL and the Solvency II BEL upon recapture of the remaining reinsured annuities following a potential failure of the reinsurer.

11.1.4 Change in Asset Liability Matching

If the investment collateral specification does not specify close matching of collateral assets and reinsured liabilities by duration, a further potential credit exposure may arise due to the cost of rebalancing the portfolio so that collateral assets are closely matched to annuity liabilities upon recapture by the Cedant following the failure of the reinsurer.

11.2 Credit Rating of the Reinsurer

As credit risk is the most significant risk arising from an annuity reinsurance transaction, the long-term credit rating of the reinsurer is an important consideration in choosing a reinsurer.

11.2.1 Acceptable Reinsurance Counterparties – Regulatory Requirements

Article 211(2) defines three types of ‘acceptable’ reinsurance counterparties namely: (a) reinsurers that comply with the Solvency Capital Requirement; (b) reinsurers deemed to operate under a solvency regime that is deemed equivalent to that laid down in Directive 2009/138/EC in accordance with Article 172; or (c) do not meet the requirements in (a) or (b) but have a credit quality which has been assigned to credit quality step 3 or better.

11.2.2 Authorisation & Regulation of the Reinsurer

The authorisation and regulation of the reinsurer will also be important considerations because of the capital requirements and public reporting requirements regulators impose on authorised and regulated entities. The identity of the reinsurer’s regulator and the capital and reporting requirements the regulator imposes on reinsurance companies within its jurisdiction should be examined as part of the due diligence on the reinsurer. In terms of political matching, it may be preferable if the reinsurer is authorised and regulated in the same jurisdiction as the Cedant.

11.2.3 Reputation and Long-Term Commitment to the Annuity Reinsurance Market of the Reinsurer

There are only a small number of traditional annuity reinsurers in the annuity reinsurance market that have a long-term track record. While new entrants to the market in the last two decades have brought innovation to the market, it is difficult for a Cedant to assess their long-term strategy and commitment to the market. Reinsurers owned by private equity firms which have historically had a relatively short-term investment horizon pose significant due diligence issues for Cedants.

12. Credit Risk Management

12.1 Assessing the Credit Exposure – Basis Risk

Where the yield on the collateral portfolio drives the interest rate for the valuation of reinsurance liabilities and hence the value of the collateral to be posted by the reinsurer, there is a risk that if the financial position of the reinsurer deteriorates, it may post a portfolio of bonds with the lowest permitted average credit rating and corresponding highest yield to reduce the value of the liabilities.

12.2 Collateral

As reinsurance is a swapping of longevity and investment risk for credit, legal, and operational risk, it is in the interests of the Cedant to mitigate the credit risk in a reinsurance arrangement from a risk management perspective. To this end, the reinsurer will be required under the reinsurance arrangements to post collateral usually to a custody account, hypothecating securities to that account, and creating a lien over such securities in the custody account in favour of the Cedant. Upon default, the Cedant should be entitled to possession of the collateral in the account and claim for any shortfall between the value of the collateral and the best estimate of liability under the reinsurance arrangement.

12.2.1 Collateral Posting

Collateral posting involves legal, operational, and liquidity risk issues for the reinsurer and legal and operational risks for the Cedant. The collateral arrangements should, at a minimum, document the following:

- The Cedant's possession and control over the assets in the collateral portfolio.
- The types and parameters of financial instruments which may be posted as collateral.
- Rules regarding the substitution of assets.
- Procedures for the independent determination of the credit rating of debt securities in the collateral portfolio.
- Procedures for the independent valuation of securities in the collateral portfolio.
- Timeframes for the posting of collateral at inception, when topping up collateral, and upon a change in the eligibility of a security for inclusion in the collateral portfolio.
- Dispute resolution procedures.

The Cedant may also specify that the duration of the collateral portfolio is within a narrow band of the duration of the liabilities under the reinsurance agreement.

12.2.2 Collateral – Implications for the Reinsurance Premium

The specification of the securities that are eligible for posting as collateral under the

reinsurance agreement has a significant impact on the reinsurance premium. As reinsurance is in essence a regulatory arbitrage based on different valuation rates of interest or regulatory capital charges, if the Cedant insists on AAA-rated collateral being posted to the collateral account, the attractiveness of the reinsurance agreement for the reinsurer will diminish substantially possibly to the point where the reinsurer will not be interested in an agreement.

12.2.3 Collateral – Credit Risk Management

As part of its credit risk management, the Cedant will wish to control a number of parameters relating to the collateral including the maximum exposure to any one issuer, the maximum exposure to issuers by industry sector and government, liquidity of issues, minimum credit quality of any one issue, the duration of the collateral portfolio, and the weighted⁹ average credit quality of the collateral portfolio.

To calculate the weighted average credit quality of the collateral portfolio, a reinsurer may suggest a mapping from credit quality to a numerical scale such that each notch down in credit quality results in an increment of one on the numerical scale. On such a mapping, where a AAA-rated bond is mapped to one on a numerical scale, a BBB-rated bond would be mapped to nine.

Such a mapping fails to capture the significant difference in default rates as between a portfolio rated AAA and a one rated BBB which is of the order of 1:610 on the weighted average risk factor ('WARF') scale for a ten-year period¹⁰. Further, as the probability of default rises as the term to redemption of the principal increases, the weighted average life should be considered when assessing the credit quality of the collateral portfolio. A table of default probabilities by weighted average credit quality and weighted average life may form part of the specifications for the collateral portfolio.

Appendix B provides a discussion of the issues to be considered when specifying the assets that may be posted as collateral under the reinsurance agreement.

12.2.4 Collateral – Avoiding Perverse Incentives

Where the yield on the collateral portfolio drives the interest rate for the valuation of liabilities, there is a risk that if the financial position of the reinsurer deteriorates, it may post a portfolio of bonds with the lowest permitted weighted average credit rating and corresponding highest yield to reduce the value of the liabilities. For this reason, the minimum weighted average credit rating of the collateral portfolio needs to be carefully

⁹ Where the numerical scale mapping credit rating to a number increases with increasing credit risk, the weighting should preferably be by par value to avoid a fall in the market value of a debt security offsetting a credit downgrade.

¹⁰ Source: Moody's Approach to Rating Collateralized Loan Obligations, June 2011.

considered in the negotiation of the investment specification of the collateral portfolio. Further, mechanisms can be put in place to reduce the speed at which the impact on the portfolio yield used to discount the reinsurance liabilities is reduced by increasing the WARF credit rating of the collateral portfolio.

12.2.5 Collateral - On-going Monitoring

The on-going monitoring of the effectiveness of the collateral arrangement and the related risks are requirements of Article 209(1)(c). The administrative burden of monitoring the collateral portfolio on a daily basis for compliance with the collateral specification schedule will increase with the complexity of the collateral specification.

12.3 Custody Agreement

The assets which are charged pursuant to the security agreement ought to be held pursuant to a custody agreement by a leading custodian bank which will act in the capacity of a nominee for the reinsurer and the Cedant. The reinsurer may remain the beneficial owner of the collateral in the custody account, but the custodian must be the legal owner of the collateral. The security created over the assets in the custody account ought to have the protections offered by the FCA Regulations to ensure that the Cedant can appropriate the assets in the custody account upon the default of the reinsurer and avoid a range of local corporate law insolvency provisions which might otherwise delay or frustrate the appropriation of the assets in the custody account. Under the protections offered by the FCA Regulations, the Cedant will have a fixed charge over the collateral in the custody account. The operation of the custody account is governed by the written custody agreement to which the reinsurer, the Cedant, and the custodian are parties.

The custody agreement will normally provide for two segregated accounts, one for securities and one for cash. The securities account is segregated in the custodian's books of account from both the custodian's property and that of other clients of the custodian¹¹. Cash held in accounts at custodians cannot be legally segregated from that of the custodian. The custodian agreement should specify that moneys cannot be moved out of the cash account and securities cannot be moved out of the securities account without authorisation from the Cedant¹². It would also be important that under the custodian agreement, neither the securities nor the cash account can be closed nor held outside of Ireland until the Cedant has confirmed to the custodian that its security has been fully satisfied. The custody agreement should also provide that if the Cedant notifies the custodian that the security agreement has become enforceable, the custodian will be required to act upon the exclusive instructions of the Cedant.

¹¹ This is an essential requirement if the reinsurance agreement is to qualify for 'effective risk transfer' pursuant to Articles 209 to 214 of the Solvency II regulation.

¹² Subject to certain conditions, the reinsurer may be granted a right under the custody agreement to substitute collateral and to withdraw collateral which is in excess of the reinsurer's liability to the Cedant without authorisation from the Cedant.

12.4 Illiquid Security as Collateral

Under the specification of eligible collateral, the reinsurance premium may be invested by the reinsurer, or an asset manager appointed by the reinsurer, in illiquid private debt or real estate mortgages. We shall use the term 'asset manager' to refer to both models for the asset management of the reinsurance premium paid to the reinsurer.

The asset manager of illiquid private debt originates and manages illiquid private debt investments. Annuity reinsurance premiums backing long-term pension liabilities are well suited to investment in illiquid private debt and real estate. These assets are very thinly traded and offer an illiquidity premium.

Where such illiquid securities are offered as collateral, the Cedant is exposed to shocks to the corporate sector.

12.4.1 Independent Valuation and Credit Assessment of Illiquid Collateral

To ensure independent valuation of illiquid collateral, the Cedant is likely to need to appoint a valuation agent which specialises in the valuation of illiquid private debt and illiquid real estate mortgages. The valuation agent must have access to the books and records of the asset manager to verify the parameters of individual loans. A specialist valuation agent is an added cost and an added administrative burden.

The Cedant will also require that it will be able to obtain reliable credit rating assessments for the illiquid collateral. Absent a credit assessment by a nominated External Credit Assessment Institution ('ECAI'), this may be done via Article 176a¹³ which provides for an internal assessment of credit quality steps of bonds and loans. However, one of the conditions of Article 176a is that the issuer is prohibited from issuing new debt without the prior agreement of the insurance or reinsurance undertaking. In the private placement market, it is highly unlikely that a borrower would agree to such a covenant. Thus, it would appear that a credit rating from an ECAI would be required to provide the Cedant with favourable SCR treatment of the debt should it have to take possession of it in a default situation.

12.4.2 Collateral Specification for Illiquid Assets

Collateral specification in relation to illiquid assets is more difficult. For example, in the case of mortgages granted over real estate, a host of lending criteria would need to be defined including, the types of real estate, the geographic locations of the real estate, loan-to-value ratios, property valuation, borrower cash flow criteria, and whether loans can be amortising or include a bullet repayment at the end of the loan term.

¹³ Commission Delegated Regulation (EU) 2019/981 amended Commission Delegated Regulation (EU) 2015/35 by inserting Article 176a into the latter commission delegated regulation.

12.4.3 Recapture of Illiquid Collateral

In the case of illiquid securities, the Cedant would need to consider how it will manage a block of say, middle-market loans, originated and managed by the reinsurer's asset manager following the failure of the reinsurer and the recapture of such assets. The fate of the asset manager upon the failure of the reinsurer is likely to be very uncertain.

A contingent investment management agreement may need to be in place with an investment manager specialising in such illiquid assets. In addition, provision would need to be made for the transfer of all the relevant documentation and meeting notes between the borrower and the asset manager regarding such loans so that the contingent asset manager would be able to take over the management of such loans at short notice. Further, for highly illiquid assets, the Cedant may request the reinsurer to grant the Cedant an irrevocable power of attorney to execute documents in the name of the reinsurer to effect the transfer of assets to and obtain associated documents for the Cedant in the event of insolvency of the reinsurer.

12.5 Retrocession

The reinsurance agreement may permit the reinsurer to transfer the risks which it has acquired from the Cedant to another reinsurer, a retrocession. The extent of any retrocession and the entity to which the reinsurer may retrocede the risks acquired from the Cedant have credit risk implications for the Cedant. Reinsurers are likely to resist a clause in the reinsurance agreement which restricts the third party with which they may place retrocessions.

At a minimum, the Cedant ought to insist on a clause in the reinsurance agreement requiring the reinsurer to: (i) exercise all due skill, care, and diligence in the selection and appointment of a retrocession counterparty; and (ii) consider the extent to which it is reliant on the retrocession counterparty to meet its obligations under the reinsurance agreement. If the Cedant is in a strong negotiating position, it may be able to circumscribe the long-term credit rating and the regulatory status of the retrocession counterparty.

12.6 Issues Posed by the use of Derivatives

The purposes for which derivatives may be used in the collateral portfolio ought to be clearly outlined from the perspective of the Cedant. It is operationally and administratively difficult for a reinsurer holding exchange traded derivatives and over-the-counter derivatives to assign them to the Cedant. For example, if the reinsurer posts a USD-denominated bond to the collateral portfolio and decides to hedge the cash flows on the USD exposure back to EUR, it may enter into a cross-currency swap with a bank. Cross-currency swap contracts are bilateral contracts between a bank and a counterparty and are usually documented under an

International Swaps Derivatives Association ('ISDA') agreement and supporting credit support annex ('CSA') to which the bank and the counterparty are parties. It is therefore difficult to assign such a contract to the collateral portfolio. Even if the reinsurer agreed to post the variation margin received from the counterparty bank, an agreement would need to be put in place so that the Cedant had independent confirmation of the daily mark-market amount. Thus, derivatives tend not to be found in reinsurance collateral portfolios.

12.6.1 Single Platform Investment Repackaging Entity SA ('SPIRE')¹⁴

SPIRE is incorporated as a public limited liability company in the Grand Duchy of Luxembourg under the name *Single Platform Investment Repackaging Entity SA*. SPIRE is an unregulated securitisation undertaking within the meaning of articles 19 et seq. of the Grand Duchy of Luxembourg Securitisation Act 2004.

SPIRE is a special purpose vehicle ('SPV') established for the purpose of issuing asset backed securities. SPIRE has established a programme for the issuance of secured notes. The liability of SPIRE under the notes and the programme is separate in respect of each series.

SPIRE facilitates the use of a SPV to combine say, a USD corporate bond and a cross currency swap from USD to EUR within the SPV structure which then issues EUR denominated notes backed by the combination of the USD corporate bonds and the cross currency swap. This gets around the difficulties of posting derivatives to a collateral account at the price of the additional costs of the SPIRE structure.

12.7 ESG issues

Debt and other securities issued by companies deriving all or a substantial part of their revenues from pornography, tobacco, armaments, and fossil fuels may be specifically excluded for ESG reasons.

¹⁴ Source: <https://www.spire.com/about-spire/>

13. Premium Payment

13.1 Cash or in specie¹⁵

The Cedant will in all likelihood have to sell the assets matching the annuity liabilities to be reinsured to pay the reinsurance premium in cash. Alternatively, subject to acceptance by the reinsurer, the Cedant may pay the premium by transferring a portfolio of debt securities to the reinsurer.

13.2 *In specie* Transfer of Debt Securities

The reinsurer may specify certain criteria in relation to the portfolio of bonds to be transferred in payment of the reinsurance premium. Such criteria may specify the market-value weighted average duration of the portfolio of bonds and exclude certain bonds on grounds such as issuer, governing law, liquidity, remaining term to maturity, credit rating, and ESG considerations.

13.3 *In specie* Transfer of Infrastructure Debt

Infrastructure debt securities are often found in the asset portfolio of a life assurance company's annuity fund. Investment-grade infrastructure debt investments receive a more favourable SCR treatment when compared with corporate bonds of the same duration and credit quality step. However, infrastructure debt investments present 'jump risk SCR' when downgraded below investment grade. A downgrade of an infrastructure debt security below investment grade leads to a very significant increase in SCR for that infrastructure debt security. The post downgrade SCR of an infrastructure debt security is a multiple of the pre-downgrade SCR compared with the same number of steps of downgrade below investment grade for a corporate bond of the same duration. Such investments can give rise to significant volatility in the Cedant's solvency cover ratio which is undesirable from a regulatory capital perspective. Cedants may therefore wish to pay the reinsurance premium by means of an *in specie* transfer of infrastructure debt. The *in specie* transfer of infrastructure debt is more complex than that of listed corporate bonds for a number of reasons including: (i) a possible requirement to obtain permission from the borrower for the transfer and such permission may take some time to obtain; (ii) the transferee may have to adhere to certain conditions and give certain representations to the borrower to effect the transfer; (iii) there may be government taxes such as stamp duty payable to effect the transfer; and (iv) the reinsurer will in all likelihood need to be satisfied that an independent valuation and credit rating of the infrastructure securities transferred can be reliably obtained on a monthly basis.

¹⁵ Rather than sell a security and transfer the cash proceeds of the sale between parties, the transfer can be made 'in-specie' without any cash changing hands. 'In-specie' is a Latin phrase meaning 'in its actual form.' A transfer which is made 'in-specie' is a transfer of a security in its present form simply by changing the owner of the security in a book entry system.

14. Monitoring the Collateral

14.1 Daily monitoring

On a daily basis, the value of the collateral portfolio will need to be monitored to make sure that its value does not fall below the value of the liabilities under the reinsurance agreement.

Under the custody agreement, the custodian shall be required to make available to the Cedant each day a file of data regarding the securities contained in the collateral portfolio. The file may be sent by email or secure file transfer protocol. The latter approach is more suitable to the automation of collateral monitoring.

Separately, using the International Securities Identification Number ('ISIN') of each security in the collateral portfolio, a valuation of each security in the collateral portfolio will have to be obtained from an independent third party such as Bloomberg.

The aggregate value of the collateral portfolio can then be compared with the last known BEL under the reinsurance agreement and an email sent to relevant members of the team overseeing the collateral arrangements. If the last known BEL under the reinsurance agreement exceeds the value of assets by a certain amount¹⁶, then the process to request a call for more collateral shall be initiated. The entire process can be automated using a Python programme or some other automation tool.

14.1.1 Data Feed from Custodian

- The following fields will be of interest in relation to the holdings in the collateral portfolio:
 - Effective date of report
 - Identifiers for use in the pricing such as the security's ISIN or SEDOL
 - Nominal amount of each holding
 - Maturity date of each holding
 - Credit ratings of each holding as provided by different ECAIs
 - Asset type, description, and sector
 - Country of incorporation
- Details of the previous month-end valuation and credit rating of infrastructure debt, private debt, and other illiquid holdings
- Cash holdings

14.1.2 Daily Price Feed from Bloomberg Price Builder

- There may be a stipulation in the reinsurance agreement that for bonds to

¹⁶ This amount is the minimum transfer amount and is usually set at the same level as seen in over-the-counter derivatives agreements which is typically EUR250,000.

qualify as eligible collateral, they must have their price, credit rating, and certain other information available on Bloomberg. Such fields in relation to a security would include:

- Dirty Bid Price¹⁷
 - Yield
 - Duration
 - Ratings
- For infrastructure debt, private debt, and illiquid holdings, the price, yield, and duration values together with credit ratings are likely to be available only on a monthly basis.

The above two sets of data can be programmatically combined using, for example, a Python programme, to give a strong indication that the portfolio has sufficient capital to cover the liabilities. Daily email notifications can be sent to relevant staff members of the Cedant to ensure compliance with the agreement or to initiate a call for more collateral as required.

14.2 Formal Valuation Reports

On a monthly basis, a full valuation report will normally be required to be prepared and sent to the reinsurer by the Cedant. This is a formal assessment of the collateral portfolio held by the custodian at the end of each month to ensure that it is sufficient to cover the reinsurer's liabilities to the Cedant and that the portfolio is in compliance with the eligible collateral guidelines. We shall refer to each such month-end valuations as a Valuation Date. A description of the likely constituents of such a report is as follows:

14.2.1 Discount rate for valuation of reinsured liabilities

Where the reinsurance premium is paid *in specie*, the initial discount rate¹⁸ for computing the value of liabilities under the reinsurance treaty may be set as the market-value-and-duration weighted yield on the assets transferred in payment of the reinsurance premium less a fixed yield¹⁹.

Earlier in the paper, we pointed out that where the yield on the collateral portfolio drives the interest rate for the valuation of liabilities, there is a risk that if the financial position of the reinsurer were to deteriorate, it may post a portfolio of bonds with the lowest permitted weighted average credit rating and corresponding highest yield so as to reduce the value of the liabilities and hence the value of the collateral pool. We indicated that there are mechanisms that can be put in place to reduce the speed at which the discount rate used to

¹⁷ In conducting the daily valuation of bonds, the bid price is used as it is more conservative.

¹⁸ The discount rate is typically a flat rate that does not vary with the term structure of the liabilities.

¹⁹ The fixed yield is designed so that when subtracted from the market-value-and-duration weighted yield on the assets transferred in payment of the reinsurance premium, the present value of the reinsured annuities at the outset of the deal is equal to the reinsurance premium paid.

value the reinsurance liabilities can be increased by the reinsurer increasing the WARF credit rating of the collateral portfolio.

One such mechanism for valuations other than the first valuation is to use a discount rate for the monthly valuation of the reinsured liabilities which is the sum of:

- (i) that used for the immediately preceding valuation date; and
- (ii) a modification.

The modification is the market-value-and-duration weighted yield on the portfolio of assets which were backing the liabilities at the start of a month *less* the market-value-and-duration weighted yield on those same assets at the end of the month.

Using such a mechanism ensures that only the change in the yield on the assets in the collateral portfolio at the beginning of the month is brought through to the valuation of reinsurance liabilities rather than a potential step change in the yield on the assets in the collateral portfolio between the beginning and end of a month arising from the reinsurer posting to the collateral portfolio a portfolio of bonds with the lowest permitted weighted average credit rating and corresponding highest yield to reduce the value of the liabilities.

Bonds with wide spreads over government issues of the same tenor and coupon tend to experience greater spread changes. So, while the mechanism will slow down the rate at which the yield on the assets in the collateral portfolio can be made to rise by posting lower credit quality assets, the collateral investment guidelines need to define a minimum weighted average credit rating for the collateral portfolio.

14.2.2 Liabilities

The discount rate in the step above is used to revalue the liabilities at each Valuation Date after adjusting for: (i) the payments that have been made during that month; (ii) deaths; and (iii) benefit increases due to indexation or escalation.

14.2.3 Asset values

On the Valuation Date, liquid assets are valued on a bid basis in a similar manner to the daily monitoring process described in paragraph 14.1. The independent valuation and credit rating of infrastructure debt, private debt, and other illiquid assets will be updated as at each Valuation Date.

At each Valuation Date, the portfolio of assets and the cash balance is then compared to the value of the liabilities. If the liabilities exceed the value of assets by a certain amount²⁰, then the process to request a call for more collateral shall be initiated.

²⁰ This amount is the minimum transfer amount and is usually set at the same level as seen in over-the-counter derivatives agreements which is typically EUR250,000.

14.2.4 Compliance with Eligibility Criteria

The report is also likely to provide an analysis of the collateral portfolio's compliance with the eligibility criteria. These criteria will stipulate such metrics as limitations on:

- Credit ratings, the lower the rating, the lower the percentage of the collateral portfolio that can be in that rating category;
- Geographic diversification of issuers, for example, as between, the European Union, Great Britain, the United States of America, other developed markets, and emerging markets; and
- Diversification by industry sector.

In addition, the report shall confirm, if such is the case, that there are no securities issued by excluded issuers or sectors.

14.3 Automation

While automation can be used to mitigate the amount of work involved in monitoring the portfolio, it is virtually impossible to eliminate fully the need for updates and revisions to the automated process. The monthly formal valuation report is likely to be a manual process rather than an automated process because of the level of oversight required in reviewing it.

It is estimated that around 0.1 of a reasonably experienced full-time equivalent staff member would be required to oversee the monitoring and reporting aspects of the reinsurance arrangement for the term of the contract. Just as there is a Solvency II reserve for the expenses of paying annuities, there is also likely to be a Solvency II reserve for the expenses of monitoring of the reinsurance agreement.

15. Legal Risk Management

15.1 List of agreements

At a minimum, the set of legal agreements to give effect to a reinsurance agreement is likely to be composed of the following:

- The reinsurance agreement including the eligible collateral guidelines.
- A custody agreement between the reinsurer, the custodian, and the Cedant.
- A security agreement between the reinsurer and the Cedant to take a fixed charge over the collateral posted by the reinsurer to the Cedant.

15.2 Enforceability

Article 209(1)(a) requires that the contractual arrangements and transfer of risk are legally effective and enforceable in all relevant jurisdictions. Assurances in relation to legal effectiveness and enforceability ought to cover all the transaction documents and are likely to be best supported by an opinion from external legal counsel.

15.3 Recognising the Reinsurance Arrangement as a 'risk mitigation technique'

Assurances in relation to the reinsurance agreement being recognised as a 'risk mitigation technique' under Articles 209 to 215 are likely to involve a combination of opinions from the senior management of the Cedant and from external legal counsel.

15.4 Termination Events

The Cedant will wish to ensure that, absent insolvency of the reinsurer, the reinsurance arrangement may not be unwound by the reinsurer. If the Cedant has to re-inherit the annuity liabilities, in addition to setting up the reserves for the re-inherited liabilities, the Cedant will need sufficient capital for the SCR and the risk margin associated with the re-inherited BEL.

While there are certain events of termination common to both the Cedant and the reinsurer, such as, fraud and loss of authorisation by the other party, there is a key difference between the rights of the Cedant to terminate the contract and those of the reinsurer: The Cedant can terminate the agreement on the insolvency of the reinsurer but the reinsurer cannot terminate the agreement upon the insolvency of the Cedant.

Almost all of the rights granted to the reinsurer to terminate the agreement are of the nature of failures on the part of the Cedant, such as failure to permit a legitimate substitution of collateral in the collateral portfolio. Thus, if the Cedant performs in line with the contract, the reinsurer should have no opportunity to terminate the contract.

15.4.1 Cedant's Right to Terminate the Reinsurance Agreement

The main events that will give the Cedant a right to terminate the reinsurance agreement are likely to be as follows:

- Insolvency of the reinsurer
- Fraud on the part of the reinsurer
- The reinsurer assigns any of its obligations or rights under the reinsurance agreement to a third party other than as permitted under the reinsurance agreement
- A material breach by the reinsurer of the warranties or the covenants given under the reinsurance agreement and such breach having a material adverse effect on the Cedant
- Reinsurer's failure to make a payment within a specified number of days of the due date of that payment
- Reinsurer's failure to top-up the collateral account as required under the reinsurance agreement within a specified number of days of being requested to do so
- Reinsurer loses its authorisation to operate as a reinsurer
- Reinsurer transfers assets out of the custody account without authorisation
- Reinsurer attempts to create or creates a security interest over the assets in the collateral account
- Reinsurer challenges the validity of any security interest granted over the assets in the collateral portfolio

A Cedant may seek to add an additional termination event, namely, that the solvency cover of the reinsurer dips below 100% of its solvency capital requirement for any length of time. Reinsurers tend to resist the right of the Cedant to terminate the agreement in such circumstances. Certainly, a termination trigger set at 90% is likely to be strongly resisted by a reinsurer on the grounds that it may be a temporary dip in solvency cover and for which the regulator has accepted a recovery plan. Even if the reinsurer were to agree to a 90% termination threshold, it is likely to affect the reinsurance premium. It may be possible to negotiate a termination trigger that is set at a lower level, for example, 65%, without a significant effect on the reinsurance premium.

15.4.2 Reinsurer's Right to Terminate the Reinsurance Agreement

The main events that will give the reinsurer a right to terminate the reinsurance agreement are likely to be as follows:

- Cedant loses its authorisation to operate as a life assurance company
- Cedant serves a notice to exercise its rights under the security agreement
- In cases where the Cedant is the valuation agent for the collateral portfolio, persistent failure by the Cedant to perform its duties as a valuation agent
- Good faith disputes aside, the Cedant fails to consent to a substitution, withdrawal, or

release of assets in the collateral portfolio when legitimately required to do so

- A material breach by the Cedant of the warranties given under the reinsurance agreement and such breach has a material adverse effect on the reinsurer
- Cedant assigns any of its obligations or rights under the reinsurance agreement to a third party other than as permitted under the reinsurance agreement
- Fraud on the part of the Cedant.

16. Default of the Reinsurer

16.1 Re-inheriting the Liabilities

If the reinsurer defaults, the Cedant will once again assume the liabilities for the outstanding annuity payments under the defaulted reinsurance agreement.

In addition to setting up the reserves for the re-inherited liabilities, the Cedant will need sufficient capital for the SCR and the risk margin associated with the re-inherited liabilities. Further, where the Cedant has a policy of maintaining an excess of solvency cover over the minimum required, such as 140% cover, additional capital will be required.

16.2 Investment Management of Collateral Assets upon Default

Absent an in-house investment team at the Cedant, a contingent investment management agreement will need to be in place with an investment manager skilled in managing the eligible assets in the collateral specification.

17. Conclusions

Annuity reinsurance involves the Cedant swapping longevity and investment risks for legal, credit, and operational risks. Compared with a portfolio transfer of a block of annuity business to another insurance undertaking, it has significantly lower costs and is much quicker to execute.

Annuity reinsurance is a form of regulatory arbitrage as the reinsurer must be able to discount the liabilities at a higher rate of interest and/or hold a lower level of regulatory capital in respect of the block of business reinsured by the Cedant either on its own account or through retrocessions. The higher rate of interest may come from investing in illiquid assets which provide an illiquidity premium.

An annuity reinsurance agreement may deliver a range of benefits for a Cedant, including reducing the Cedant's longevity and investment risks, increasing the Cedant's solvency capital cover, and generating an IFRS profit for the Cedant in a particular accounting period.

The reinsurance premium to be paid to reinsure a block of annuities is in part determined by the nature of the assets that may be posted to the collateral portfolio by the reinsurer. All other things being equal, permitting the posting of more illiquid assets to the collateral portfolio will tend to lower the reinsurance premium. However, this increases the costs and complexity of monitoring the Cedant's credit exposure to the reinsurer. Such illiquid assets will need regular independent valuations and assessments of their credit ratings, possibly powers of attorney to be put in place for the Cedant to take over such assets in the event of default of the reinsurer, and possibly also a need for a contingent investment management agreement.

Entering into a reinsurance agreement is not without costs. Costs include the legal fees to ensure effective risk transfer for Solvency II purposes, the management time in negotiating the agreement, and the ongoing costs of administering the agreement and monitoring the credit exposure to the reinsurer for a period of 30 years or more. The premium paid by the Cedant to the reinsurer must therefore be above a certain minimum amount to justify the costs. It is unlikely that a premium of less than EUR250m would justify such initial and ongoing costs.

18. APPENDIX A - Regulatory Requirements for Effective Risk Transfer

18.1 Solvency II Delegated Regulation – Risk Mitigation Techniques

For a Cedant to gain an improvement in its solvency cover ratio, a reinsurance agreement must effectively transfer the relevant risks, principally spread risk and longevity risk to the reinsurer. To effectively transfer the relevant risks, the reinsurance agreement must qualify as a 'risk mitigation technique' under Articles 209 to 215. A reinsurance agreement which qualifies as a 'risk mitigation technique' will reduce the basic solvency capital requirement under Article 101 of Directive 2009/138/EC. We now examine how the requirements of Articles 209 to 215 might be met in practice.

18.2 Article 209(1)(a) – Legally Enforceable

Article 209(1)(a) requires that the contractual arrangements and transfer of risk are legally effective and enforceable in all relevant jurisdictions.

Comment on Practical Implementation of Requirement

Assurances in relation to legal effectiveness and enforceability are likely to be best supported by an opinion from external legal counsel.

18.3 Article 209(1)(b) – Effectiveness of the Arrangement

Article 209(1)(b) requires that the Cedant has taken all appropriate steps to ensure the effectiveness of the arrangement and to address the risks related to the arrangement.

Comment on Practical Implementation of Requirement

Particular attention should be paid to any condition in the reinsurance agreement which:

- (i) could undermine the effectiveness of the transfer of risk; and
- (ii) is beyond the control of the Cedant.

Examples include: conditions precedent and unilateral rights granted to the reinsurer to terminate the reinsurance agreement. A reinsurance agreement should be free of conditions precedent. Unilateral rights granted to the reinsurer to terminate the reinsurance contract include tax events, force majeure, minimum number of or monetary amounts of annuities in force, and illegality.

Force majeure and illegality clauses in the reinsurance agreement are unlikely to undermine the effectiveness of the arrangement for the purposes of Article 209(1)(b). Both types of clauses arise in cases where the law recognises that without default of either party a contractual obligation may become incapable of being performed because the circumstances in which performance is called for would render it a thing radically different from that which was undertaken by the contract.

The risk from termination by the reinsurer under 'minimum number of or monetary amounts of annuities in force' clause can be managed by setting the minima at appropriately low levels. The risk of termination due to changes in taxation law or the interpretation of taxation law can be managed by:

- (i) a clause requiring the parties to use best endeavours to restructure the reinsurance agreement to mitigate the tax event; and
- (ii) ensuring that the amount paid by the reinsurer to the Cedant on termination due to a tax event is nothing less than the full value of the liabilities under the reinsurance agreement with no deduction for a margin for the reinsurer.

18.4 Article 209(1)(c) – Ongoing Monitoring of Effectiveness and Risks

Article 209(1)(c) requires that the Cedant can monitor the effectiveness of the arrangement and the related risks on an ongoing basis.

Comment on Practical Implementation of Requirement

Suggested procedures and IT system requirements to meet the requirements of Article 209(1)(c) are set out in paragraph 14.

18.5 Article 209(1)(d) – Direct Claim on Reinsurer

Article 209(1)(d) requires that the Cedant has a direct claim on the reinsurer in the event of a credit event such as default, insolvency, or bankruptcy of the reinsurer. The term 'direct claim' is not defined in the relevant legislation nor in any related guidance.

Comment on Practical Implementation of Requirement

If the Cedant had to rely on a trustee, a cut-through arrangement to a retrocession reinsurer, or other procedural 'barriers' which might prevent a claim against the reinsurer by the Cedant following a credit event, such arrangements are unlikely to be classified as a direct claim on the reinsurer. Although Article 209 refers to qualitative criteria which must be met to ensure effective risk transfer, it is also unlikely that a contractual clause in the reinsurance agreement providing for limited recourse against the reinsurer, a quantitative limit, would qualify as a direct claim on the reinsurer.

Comment on Practical Implementation of Requirement

To meet the requirements of Article 209(1)(d), the obligations of the reinsurer ought to be secured pursuant to a security agreement in favour of the Cedant. The security agreement should be drafted to ensure that it benefits from the protections of the FCA Regulations. These protections include:

- (i) the Cedant's right to take exclusive possession of the assets in the collateral portfolio upon the default of the reinsurer; and
- (ii) the waiver of certain provisions of Irish corporate insolvency legislation to ensure the minimum of formalities in securing the collateral upon the insolvency of the reinsurer.

If the reinsurer is being wound up by a liquidator, a security agreement meeting the requirements of the FCA Regulations can permit the Cedant to claim the assets in the collateral portfolio as a secured debt outside of the insolvency process and claim any shortfall as an unsecured debt.

Unsecured debts rank very low in the priority for payment in a liquidation; the Irish Statutory Rules of Priority are as follows:

1. Remuneration, costs, and expenses of an examiner
2. Fixed charge holders
3. Expenses certified by an examiner
4. Costs and expenses of a winding-up or liquidation
5. Fees due to the liquidator
6. Super preferential creditors like the Revenue and employees
7. Preferential debts
8. Floating charge holders
9. Unsecured creditors

Recovery of unsecured debts depends on the residual assets available to the liquidator having met all earlier payment priorities. Absent a winding up of the reinsurer, the assets in the collateral portfolio will be managed by the reinsurer.

18.6 Article 209(1)(e) – No Double Counting of Risk-Mitigation

Article 209(1)(e) requires that there is no double counting of risk-mitigation effects in own funds and in the calculation of the SCR.

18.7 Article 209(2) – In Force Period Greater than 12 Months

Article 209(2) requires that only risk-mitigation techniques that are in force for at least the next 12 months and which meet the qualitative criteria of Article 209(1) shall be fully taken into account in the SCR.

Comment on Practical Implementation of Requirement

In view of the term of typical annuity reinsurance contracts and assuming neither party terminates the reinsurance agreement, the risk-mitigation techniques may be regarded as in force for at least 12 months and therefore meeting this qualitative criterion.

18.8 Article 209(3) – In Force Period Less than 12 Months

For reinsurance contracts likely to be in force for at least 12 months, Article 209(3) does not apply.

18.9 Article 210(1) – Clearly Defined and Incontrovertible Risk Mitigation

Article 210(1) requires that the contractual arrangements governing the risk-mitigation technique shall ensure that the extent of the cover provided by the risk-mitigation technique and the transfer of risk is clearly defined and incontrovertible.

Comment on Practical Implementation of Requirement

To meet the requirements of Article 210(1), the reinsurance agreement should clearly document that the Cedant is ceding to the reinsurer and the reinsurer is accepting the cessation and providing reinsurance to the Cedant in respect of the Cedant's liabilities to pay the benefits due under the reinsured annuity policies from the date of the reinsurance

agreement until it is terminated.

18.10 Article 210(2) – No Material Basis Risk Unless Reflected in Basic SCR

Article 210(2) requires that the contractual arrangement shall not result in material basis risk²¹ or in the creation of other risks, unless this is reflected in the calculation of the SCR.

Comment on Practical Implementation of Requirement

Annuity reinsurance involves swapping investment and longevity risks for credit, legal, and operational risks. The credit risk is reflected in the SCR though the counterparty default risk module and legal risk is dealt with as a qualitative requirement under various subsections of Articles 209 and 210. The swapping of longevity and investment risks for credit risk which falls into the counterparty default risk module is likely to increase the diversification of the basic solvency capital requirement as the correlation of market risk SCR and counterparty default risk SCR is 0.25.

18.11 Article 210(3) – Meaning of Material Basis Risk¹⁸

Basis risk is regarded as material if it leads to a misstatement of the risk-mitigating effect on the Cedant's basic solvency capital requirement that could influence the decision-making or judgement of the intended user of the information.

18.12 Article 210(4) – Determination of Legal Effectiveness and Enforceability

Article 210(4) requires the determination that the contractual arrangements and transfer of risk is legally effective and enforceable in all relevant jurisdictions in accordance with Article 209(1)(a) is based on the following:

(a) whether the contractual arrangement is subject to any condition which could undermine the effective transfer of risk, the fulfilment of which is outside the direct control of the Cedant; and

(b) whether there are any connected transactions which could undermine the effective transfer of risk. The issues arising in meeting the requirements of Article 210(4)(a) were discussed in paragraph 8.2.

Comment on Practical Implementation of Requirement

In relation to Article 210(4)(b), it would be important to check that there are no master agreements or other arrangements linking the reinsurance agreement in question to other agreements with the reinsurer.

²¹ The term 'basis risk' is defined in Article 1(25), '*basis risk*' means the risk resulting from the situation in which the exposure covered by the risk-mitigation technique does not correspond to the risk exposure of the insurance or reinsurance undertaking. As an example, a mismatch between the currency of the exposure covered by the risk-mitigation technique and the risk exposure of the Cedant.

18.13 Article 210(5) – Combinations of Risk Transfer Agreements

Where the Cedant combines several contractual agreements to transfer risk, each contract must meet the requirements set out in Articles 210(1) and 210(4) and all the contracts together must meet the requirements of Articles 210(2) and 210(3).

18.14 Article 211(1) – Qualifying Criteria for Reinsurance Contracts

Article 211(1) relates to the transfer of underwriting risks, in the case of annuity contracts, longevity risk, using reinsurance contracts or special purpose vehicles and requires that in order to take into account the risk-mitigation technique in the basic solvency capital requirement, the qualitative criteria set out in Articles 209 and 210 and those set out in paragraphs 2 to 6 of Article 211 shall be met.

18.15 Article 211(2) – Qualifying Criteria for ‘Acceptable’ Reinsurers

Article 211(2) defines three types of ‘acceptable’ reinsurance counterparties for the purposes of Article 211 namely:

- (a) reinsurers that comply with the Solvency Capital Requirement;
- (b) reinsurers deemed to operate under a solvency regime that is deemed equivalent to that laid down in Directive 2009/138/EC in accordance with Article 172; or
- (c) do not meet the requirements in (a) or (b) but have a credit quality which has been assigned to credit quality step 3 or better.

Comment on Practical Implementation of Requirement

The Cedant will have to be satisfied that the reinsurer is one of the three ‘acceptable’ types. This information should be readily available from the Cedant’s due diligence on the reinsurer.

18.16 Article 211(3) – Reinsurer Ceases to Meet Solvency II Requirements

Article 211(3) deals with the case where a counterparty to a reinsurance contract is an insurance or reinsurance undertaking which ceases to comply with the Solvency Capital Requirement and the Minimum Capital Requirement after the commencement of the reinsurance contract.

Comment on Practical Implementation of Requirement

This Article would not be relevant when reviewing a proposed reinsurance agreement with an ‘acceptable’ reinsurer as that term is defined in paragraph 18.15.

18.17 Articles 211(4), 211(5), and 211(6) – Transfer to an SPV

Articles 211(4), 211(5), and 211(6) relate to the transfer of risk to a special purpose vehicle and are not relevant to the discussion in this paper.

18.18 Article 212 – Risk-Mitigating Techniques Beyond the Scope of Article 211

On the assumption that all the risk-mitigating techniques come within the scope of Article 211, Article 212 would not apply to the reinsurance agreement.

18.19 Article 213 – Qualitative Criteria Not Met

On the assumption that the qualitative criteria set out in Article 211(1) are met and that Article 212 does not apply, Article 213 would not be relevant to the consideration of risk mitigation techniques.

18.20 Article 214 – Collateral Arrangements

To mitigate the credit exposure that the Cedant has to the reinsurer, a custody account will normally be established with a custodian and the reinsurer will post financial instruments and cash to securities and cash accounts respectively with the custodian the value of which will at least equal the value of the reinsurer's liability to the Cedant. The arrangement is legally documented under a custody agreement between the reinsurer, the Cedant, and the custodian.

The reinsurer will be the beneficial owner of the assets in the custody account and the custodian will be the legal owner of those assets. While the custodian is the legal owner of the assets in the collateral portfolio, the custody agreement will provide that the custodian will not permit the withdrawal of assets from the custody account without the written permission of the Cedant. In certain limited circumstances, the reinsurer may withdraw part of the collateral and provide collateral of equivalent value in return and remove assets from the custody account to the extent that there is an excess of assets in the custody account relative to the reinsurer's liability to the Cedant.

Article 214 specifies that in the calculation of the basic solvency capital requirement, collateral arrangements shall only be recognised where, in addition to the qualitative criteria in Articles 209 and 210, a number of additional criteria set out in points (a) to (e) of Article 214(1) are met.

18.21 Article 214(1)(a) – Cedant Must Have Control over the Collateral Account

Article 214(1)(a) requires that the Cedant shall have the right to liquidate or retain, in a timely manner, the collateral in the event of a default, insolvency or bankruptcy or other credit event of the reinsurer.

Comment on Practical Implementation of Requirement

The reinsurance agreement must therefore provide that the Cedant has the right to liquidate the assets in the custody account upon the insolvency of the reinsurer. In order for the reinsurer to be able to liquidate the assets in the custody account immediately upon the insolvency of the reinsurer, the security created by the reinsurer under the security

agreement must be covered by the FCA Regulations. To ensure the application of FCA Regulations in the event of the insolvency of the reinsurer, it is vital that the custody agreement makes absolutely clear that the Cedant has, for the purposes of the FCA Regulations, both 'possession' of and 'control' over the assets in the collateral portfolio. Where collateral is held in a custody account with a custodian as trustee or nominee, 'possession' is exercised by the custodian on behalf of the Cedant. Under such an arrangement, the 'possession' requirement of the FCA Regulations ought to be met. To meet the 'control' requirement of the FCA Regulations, the documentation must show that the Cedant can prevent the reinsurer from removing assets from the collateral portfolio except in the limited circumstances of their being an excess of collateral relative to the reinsurer's liability to the Cedant and to withdraw part of the collateral and provide collateral of equivalent value in return. If the custody agreement provides that the custodian will not permit the withdrawal of assets from the custody account without the written permission of the Cedant, the 'control' requirement of the FCA regulations ought to be met. Support for compliance with Article 214(1)(a) can be usefully underpinned by an opinion from a senior counsel.

18.22 Article 214(1)(b) – Quality of Collateral

Article 214(1)(b) requires that there is sufficient certainty as to the protection achieved by the collateral because of either of the following: (i) it is of sufficient credit quality, is of sufficient liquidity, and is sufficiently stable in value; (ii) it is guaranteed by a counterparty, other than a counterparty referred to in Article 187(5) and 184(2) which has been assigned a risk factor for concentration risk of zero percent.

Comment on Practical Implementation of Requirement

In the case of (i), the reinsurance agreement will set out the eligible collateral specifications for the collateral portfolio to ensure that the credit quality, liquidity, and stability of value requirements in relation to the collateral set out in Article 214(1)(b) are adhered to as part of the reinsurance agreement. This will be achieved through documented collateral portfolio eligibility requirements, credit rating methodologies, limits in relation to industry sectors and issuers, issue size limits, issuer jurisdiction, governmental issuers, currency exposures, valuation requirements, ESG requirements, and through the monitoring of the adequacy of collateral and collateral top-up procedures.

18.23 Article 214(1)(c) and 214(1)(d) – Absence of Positive Correlation

Article 214(1)(c) requires that there is no material positive correlation between the credit quality of the counterparty and the value of the collateral while Article 214(1)(d) requires that the collateral is not securities issued by the reinsurer or a related undertaking of the reinsurer.

Comment on Practical Implementation of Requirement

To meet these requirements, the eligible collateral specifications for the collateral portfolio

will prohibit the inclusion of debt securities issued by the Cedant and debt securities issued by the reinsurer and severely restrict exposure to the debt securities of insurance, reinsurance, and other similar entities in the financial services sector. In addition, the ongoing monitoring of the collateral account would need to ensure compliance with the eligible collateral specifications of the collateral portfolio.

18.24 Article 214(2) – Collateral Held by a Custodian or Third Party

Article 214(2) requires that where a collateral arrangement meets the definition in Article 1(26)(b) and involves collateral being held by a custodian or other third party, the insurance or reinsurance undertaking shall ensure that criteria set out at Article 214(2) (a) to (e) are met. These criteria are discussed below.

18.25 Article 214(2)(a) – Segregation of Collateral Assets

Article 214(2)(a) requires that the relevant custodian or other third party segregates the assets held as collateral from its own assets.

Comment on Practical Implementation of Requirement

This requirement will usually be met by a clause in the custody agreement stating this requirement.

18.26 Article 214(2)(b) – Segregated Assets to be Held by a Deposit-Taking Institution with a Minimum Credit Rating

Article 214(2)(b) requires that the segregated assets are held by a deposit-taking institution that has a credit quality which has been assigned to credit quality step three or better.

Comment on Practical Implementation of Requirement

This objective requirement must be fulfilled for the reinsurance agreement to qualify for 'effective risk transfer' under the Solvency II Regulation. Further, in the event that the custodian's credit quality falls below the step three requirement, the custody agreement: (i) should require the reinsurer to appoint another custodian with credit quality which has been assigned to credit quality step three or better within a relatively short period of time, typically equal to the notice period of the custodian to terminate the contract; and (ii) provide that if the reinsurer fails to act in relation to the requirement in (i), eligible assets representing the value of the liabilities under the reinsurance agreement must be transferred to the Cedant.

18.27 Article 214(2)(c) – Segregated Assets Identified and Under Control of Cedant

Article 214(2)(c) requires that the segregated assets are individually identifiable and can only be changed or substituted with the consent of the Cedant or a person acting as a trustee in relation to the Cedant's interest in such assets.

Comment on Practical Implementation of Requirement

To meet this requirement, the custody agreement may provide that the Cedant's consent is required for all substitutions. However, this approach to meeting the requirements of Article 214(2)(c) is administratively burdensome. An alternative approach which is less burdensome from an administrative perspective but still likely to meet the requirements of Article 214(2)(c) is for the custody agreement to provide that the Cedant's consent is required for substitutions except where a defined set of substitution conditions are met. Such substitution conditions are likely to include: (i) that the total value of the collateral before and after the substitution must equal or exceed the reinsurer's liabilities under the reinsurance agreement; (ii) the assets being substituted must be eligible assets under the eligible collateral specifications; and (iii) purchases and sales of the assets in the custody account will comply with the requirements of the custody agreement and regulatory requirements of the relevant market for the asset in question.

18.28 Article 214(2)(d) – Cedant's Right to Liquidate Assets upon Default

Article 214(2)(d) requires that the Cedant has or is a beneficiary under a trust where the trustee has the right to liquidate or retain, in a timely manner, the segregated assets in the event of a default, insolvency or bankruptcy or other credit event relating to the custodian or other third party holding the collateral on behalf of the reinsurer.

Comment on Practical Implementation of Requirement

See paragraphs 7.4 and 12.3 for a discussion of how the requirements of Article 214(2)(d) may be met.

18.29 Article 214(2)(e) – Segregated Assets are Ring-fenced

Article 214(2)(e) requires that the segregated assets shall not be used to pay, or to provide collateral in favour of, any person other than the Cedant or as directed by the Cedant.

Comment on Practical Implementation of Requirement

To meet the requirements of Article 214(2)(e), the security agreement should prohibit the reinsurer from creating any other security interest over the assets in the collateral portfolio and from dealing in those assets except where authorised by the Cedant or deemed authorised by the Cedant such as in relation to the substitution conditions specified in paragraph 18.27.

18.30 Article 215 - Guarantees

On the assumption that no guarantee is provided as part of the reinsurance arrangement, Article 215 will not apply.

19. APPENDIX B – Specification of Collateral Assets

Table 1 identifies some of the key issues to be considered in specifying the assets that may be posted as collateral under the reinsurance agreement.

Table 1

Collateral Specification Issue	Eligibility Criteria
Valuation	The Cedant must be able to value the collateral independently of the reinsurer. In the case of liquid collateral, the reinsurance agreement may specify that valuations must be available on say, Bloomberg, for all the assets posted as collateral. This is particularly important for automated monitoring of the collateral account and credit risk management. In the case of illiquid assets like private debt, private placements, infrastructure, and real estate, the Cedant must have access to independent valuations of the collateral at a frequency of no less than monthly. There are several firms that provide independent valuations of such illiquid assets.
Credit Rating	The Cedant must be able to obtain the credit rating of each bond in the collateral portfolio independently of the reinsurer. In the case of liquid collateral, the reinsurance agreement may specify that credit ratings must be available on say, Bloomberg, for all the assets posted as collateral. This is particularly important for automated monitoring of the collateral account and credit risk management. In the case of illiquid assets like private debt, private placements, infrastructure, and real estate, the Cedant must have access to independent credit ratings of the collateral. There are several firms that provide independent credit ratings for such illiquid assets. Independent credit ratings of collateral should be available at a frequency of no less than monthly.
Collateral Adequacy Valuation Frequency	For liquid securities, daily valuations of the assets in the collateral portfolio can be performed. The aggregated value of the assets in the collateral portfolio can then be compared with the most recent valuation of the reinsurance liabilities which ideally should not be more than one month old. Assuming that the liabilities can be valued at least monthly, the frequency of independent valuation of the less liquid assets will determine the frequency with which the adequacy of collateral can be fully assessed. Independent valuations of the collateral should be available at a frequency of no less than monthly.
Currency	The collateral specification may permit assets denominated in foreign currency to be posted as collateral. For a EUR-denominated transaction, USD, JPY, and GBP ²² assets that meet the other collateral specifications may be permitted as

²² One might ask: Why would a reinsurer wish to post foreign currency assets as collateral? One possible reason is that a

Collateral Specification Issue	Eligibility Criteria
	collateral. See paragraph 12.6 for a discussion of the hedging of foreign currency exposures back to euro. From the perspective of the Cedant, the eligible value of USD, JPY, and GBP assets posted as collateral may be restricted to say, 95%, of their equivalent EUR-denominated value.
Jurisdiction	Domicile of issuers of bonds and other securities and the governing law of such securities may be limited to certain jurisdictions where there is strong adherence to the rule of law. The World Justice Project provides a Rule of Law Index ranking countries in accordance with their adherence to the rule of law.
Liquid Securities	Liquid securities will generally consist of cash, cash equivalents, letters of credit, sovereign debt, supranational debt, and corporate bonds. Where units in money market funds are posted as collateral, the Cedant might reasonably require that such funds are authorised and regulated in the EU, the U.S., or the U.K.
Letters of Credit	The Cedant will wish to ensure that letters of credit can be drawn down at any time without conditions. The Cedant will most likely wish to ensure that each bank issuing a letter of credit: (i) must provide a minimum of say, 60 days' notice of the withdrawal of a letter of credit; (ii) must inform the Cedant of the location of the relevant branch or branches at which the Cedant may draw down on each letter of credit; (iii) must confirm that it has completed the anti-money laundering, countering the financing of terrorism, and any other due diligence on the Cedant to permit immediate draw down; (iv) has a certain minimum short-term or long-term credit rating; and (v) has its head office or a branch in a certain defined list of countries one of which must include Ireland. The Cedant may also wish to place a restriction on the governing law of each letter of credit. Letters of credit do not form part of the collateral portfolio subject to the custodian agreement as they are held directly by the Cedant.
Less Liquid Securities	High yield debt, convertible bonds, subordinated debt, and investment grade mortgage-backed securities, and asset-backed securities fall into this category. The Cedant may wish to restrict such securities to, for example, those that are constituents of bond indices and limit their term to maturity. A further restriction may require that the security would no longer count as eligible collateral if there has been no price quotation for the security in the last n days; a value of n equal to five might be appropriate.

globally diversified reinsurer may have reinsurance arrangements which are not collateralised in say, the U.S., the U.K., or Japan. Even though such arrangements are not collateralised, the reinsurer may hold assets denominated in USD, GBP, and JPY to back liabilities under such arrangements and may wish to have the flexibility to post such assets to the collateral portfolio.

Collateral Specification Issue	Eligibility Criteria
Illiquid Securities	Infrastructure debt, property, unrated debt such as residential real estate debt and commercial real estate debt, private placements, and equity release mortgages may also be considered as eligible collateral. The issues posed by illiquid securities are discussed in paragraph 12.4.
Credit Rating	While a market-value-&-duration-weighted average credit rating may be specified for the collateral portfolio, a minimum credit quality is likely to be specified for individual debt securities and the percentage of the collateral portfolio consisting of debt securities of different credit quality steps may also be specified.
Duration	There may be a requirement that the market-value-weighted duration of the assets is within a specified number of years of the duration of the liabilities. The specified number of years of the tolerance may decrease in line with the duration of the liabilities.
Issue Size	The collateral specification may restrict bonds to those with a minimum issue size. Issue size limitations may vary by currency of denomination.
Concentration Risk	The maximum exposure to any one sovereign or corporate bond issuer with the same ultimate parent company is also likely to be restricted.
Exclusions	There may be a list of both sovereign and corporate debt securities which are specifically excluded in all circumstances. For example, debt and other securities issued by the reinsurer and the Cedant and their affiliates are likely to be excluded. Exclusions may also extend to certain types of instruments such as subordinated debt, convertible bonds, debt with call options, and debt issued by special purpose companies. SPIRE notes may be an exception to the latter exclusion.
'Haircuts'	A 'haircut' is the percentage difference between the market value of an asset and the value of that asset recognised under a collateral agreement. Haircuts are designed to manage the risk that the market value of the collateral portfolio falls below the required amount and tend to increase with the volatility of the asset and the time interval between assessments of the adequacy of collateral. For bonds, haircuts tend to increase with decreasing credit rating and increasing term to maturity. For foreign currencies, haircuts tend to increase with decreasing liquidity ²³ .

²³ As measured by surveys conducted by the Bank of International Settlements.

Collateral Specification Issue	Eligibility Criteria
Top-Up Timescale	<p>When the value of the assets in the collateral portfolio falls below that of the reinsurance liabilities, there will be a timescale defined for the topping up of the assets in the collateral portfolio. It is in the Cedant's interests that this timescale be as short as possible. While collateral top-ups are same day or next business day in the world of derivatives trading, five business days would be a relatively short timescale in the world of annuity reinsurance collateral management.</p>
Minimum Transfer Amount	<p>In line with ISDA agreements, the minimum transfer amount may be set at EUR250,000. However, it may be tailored depending on the nature of the collateral and the amount of the premium for the reinsurance deal. It may also decrease as the outstanding liability of the reinsurer decreases.</p>