

MILLIMAN REPORT

A closer look at Solvency II unit matching

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Executive Summary

Solvency II unit matching is no longer just a theoretical concept but rather a common strategy used by UK insurers with material blocks of unit-linked business to help improve liquidity and balance sheet stability, and better manage market risks. In Section 2 of this report, we discuss Solvency II unit matching trends across the UK life insurance market and, in particular, the relative attractiveness and take-up of the strategy for different types of unit-linked insurance providers:

- Those with an investment philosophy, risk appetite or risk profile that renders the strategy less feasible and/or attractive, or that have limited scope to avail of unit matching.¹
- Those that employ alternative mechanisms to unit matching to achieve the same (or similar) objectives, notably the use of derivatives to mitigate the shareholder exposure to market risk on the unit-linked funds.
- Those that have implemented (or are considering implementing) unit matching typically in conjunction with other capital management solutions.

We have gained invaluable insight from our exposure to unit matching projects over recent years and are now in a strong position to understand, anticipate and effectively react to some of the practical issues and challenges that can arise. Section 3 of this report sets out what we believe are the key elements of a typical unit matching framework and provides guidance as to how a firm's overall strategy and/or its approach to specific issues might vary depending on its objectives and the particularities of the business in question.

Rather than considering unit matching in isolation, we believe it should be viewed as one important component of a complete tool kit of potential capital management techniques and solutions available to unit-linked insurance providers. As discussed in Sections 4 and 5, there are alternative mechanisms to achieve similar liquidity, capital, profitability or risk management benefits and firms should consider the benefits and challenges of these mechanisms when compared to, or used in conjunction with, unit matching.

Thus far, we have mainly seen unit matching deployed for pure investment contracts. However, in Section 6, we explore how the strategy can be extended to a more complex class of unit-linked business, namely contracts with options and guarantees. Specifically, unit matching can be used to hedge the cost of options and guarantees, but this requires a more dynamic approach, particularly in response to market movements, than is typically applied for unit matching programs.

In light of the benefits of unit matching and the popularity of the strategy in the UK life insurance market, one might find it surprising that it has not been widely adopted across Europe. Indeed, there are a number of significant unit-linked insurance markets for which, on first glance, unit matching looks like an attractive option. However, digging deeper uncovers a range of issues and challenges that would need to be overcome before widespread implementation is feasible. We discuss these potential opportunities and barriers for the wider European market further in Section 7 of this report.

¹ As described in Section 2, a firm's scope for unit matching is largely determined by the difference between the surrender value of the in-force unit-linked contracts and the value of the corresponding unit-linked technical provisions.

1. What is Solvency II unit matching?

Solvency II unit matching, or “unit matching” as we refer to it throughout this report, is the process of only holding unit-linked assets to cover the unit-linked part of the Solvency II technical provisions (plus an appropriate “buffer”) rather than the full face value or surrender value of policyholders’ unit-linked funds.

Prior to Solvency II, the mathematical reserves for unit-linked business had to be at least equal to the surrender value of the in-force policies at the valuation date. Further, the unit-linked part of those mathematical reserves had to be covered by unit-linked assets. However, since 2016, insurers just need to hold unit-linked assets to cover the typically lower unit-linked part of the Solvency II technical provisions.² This allows insurers to sell “excess unit-linked assets” that otherwise comprise part of Solvency II own funds and introduce market volatility into the solvency result (because they exceed the value of the corresponding unit-linked technical provisions and hence the asset side of the balance sheet is more sensitive to unit price movements than the liability side). The proceeds from the sale can then be used or reinvested in more appropriate or attractive ways, for example to purchase less risky or more liquid assets or to fund strategic objectives such as dividend payments, writing new business or growing through acquisitions.

Effective control processes need to be set in place to manage the sale of excess unit-linked assets to avoid breaching the Solvency II requirement to cover the unit-linked part of the technical provisions with unit-linked assets at all times. Without such processes, it is not safe to sell the excess unit-linked assets and so they cannot be considered liquid shareholder funds.

Unit matching is not a new concept but an increasing number of UK insurers have implemented (or considered implementing) this strategy in recent years and we have gained considerable experience supporting firms through this process. As a result, we are now in a position to provide further insight into what the practical implementation is likely to involve and what specific challenges and decisions different types of firms with different types of unit-linked business are likely to face.

Further information on the theory, primary benefits, potential downsides and implementation considerations associated with Solvency II unit matching is provided in the following papers by Milliman:

- [The benefits of Solvency II unit matching](#), July 2018
- [Unit-linked matching considerations under Solvency II](#), January 2015

² The unit-linked part of the technical provisions would normally be less than the surrender value as credit can be taken for the expected value of future charges and there is no floor related to the surrender value specified in the Solvency II rules.

2. UK market review

At the time of publishing our paper "The benefits of Solvency II unit matching" (July 2018), save for one or two UK insurers, the firms interested in implementing unit matching were mostly only at the exploratory or planning stages. Moving forward to the first half of 2020, there are two key UK market developments relevant to unit matching.

Firstly, there has been a marked increase in the insurers that have now implemented unit matching. Although the number of firms that have taken up unit matching is still relatively small, all of those that have are amongst the biggest in the market in terms of unit-linked liabilities. In contrast with publicly available information for 2017, several insurers have now documented the implementation of unit matching within their 2018 and/or 2019 Report and Accounts and Solvency and Financial Condition Report (SFCR). So Solvency II unit matching, both as a concept and a practical tool, is much more firmly established in the UK life insurance market and is something that we believe key stakeholders, such as the Prudential Regulation Authority (PRA), should be comfortable with if implemented robustly. Unit matching has therefore become accepted in the UK as a legitimate option for accessing liquidity and managing the market risks associated with unit-linked business. However, while we are aware of some insurers outside the UK developing or implementing unit matching solutions, at present the UK is really the only European country in which the approach has seen material implementations. In Section 7, we explore in greater detail the potential for greater unit matching in the wider European insurance market.

The second trend we have observed is the increase in options now available to UK insurers to achieve one or both goals of mitigating the risks associated with unit-linked business and exchanging an illiquid asset (the future profits expected to be earned) with a liquid asset (cash). In the latter case, options are available to access liquidity from illiquid assets that are recognised on the Solvency II balance sheet and those that are not (such as future profits that cannot be recognised due to contract boundaries). More generally options comprise investment strategies (such as unit matching), hedging programs, and innovative reinsurance arrangements. The extent to which these options have been implemented varies and we review them further in Section 4. For the remainder of this section we will focus on the liquidity, risk and capital management techniques currently employed in the context of UK unit-linked business.

Reviewing the 2019 SFCRs for the top 15 UK life insurers by volume of in-force unit-linked business, the companies fall into three categories distinguished by the approach to mitigating the market risk on unit-linked business. It should be noted that in this context it is principally the shareholder exposure to the market risk that is being mitigated, which arises due to the sensitivity of future annual management charge (AMC) income to changes in the market value of the unit-linked assets.

The firms can be broadly categorised as follows:

- No (reported) use of either hedging or unit matching.
- Use of hedging instruments only, where in the majority of cases the hedging is in the form of equity options and swaps.
- Use of unit matching together with hedging.

COMPANIES WITH NO UNIT MATCHING OR HEDGING

Turning first to the unit-linked companies that do not currently employ either unit matching or hedging instruments, the reasons for not doing so are a combination of investment philosophy, view of the market risk and (in the case of unit matching) scope to reduce the unit-linked asset holdings. A good number of these life insurers could be viewed as more akin to asset management companies than conventional insurers, and this is strongly reflected in their investment strategies, a core feature of which is fully matching the full "face" value (or at least the surrender value) of the policyholder benefit with a holding in the corresponding unit-linked funds. This position is most clearly illustrated by St James's Place in its 2019 Annual Report, which states, "*Our business model and risk appetite results in the Group holding assets to fully match the encashment value of our clients' investments.*" However, similar statements can be found in the public disclosures of BlackRock Life, UBS Asset Management Life, FIL Life Insurance, and IntegraLife. As a concept then, unit matching is essentially inconsistent with this investment philosophy, and in our view this will almost certainly be the main reason why these companies have not pursued unit matching.

These companies also tend to view the market risk associated with unit-linked business as primarily lying with the policyholder, and view the second-order exposure through volatile AMC income as a fundamental feature of the business model. Consistent with this view, the close or full matching of assets to the policyholder surrender value is commonly described as a means of mitigating market risk rather than a source. These firms also point to the diversity of assets underlying unit-linked funds as a means of risk mitigation (albeit one that the companies have only partial direct control over) and also commonly the fact that at least some of the costs associated with unit-linked business are linked to the value of assets under management, so a fall in AMC is offset by a proportionate fall in expenses. The costs—both financial and operational—of implementing either unit matching or a derivative program may therefore be viewed as unnecessary.

The scope for disinvesting holdings in unit-linked funds via unit matching is largely determined by the difference between the surrender value and the value of the corresponding unit-linked technical provisions. Where the difference is relatively small, due to features of the contracts themselves or the Solvency II valuation methodology adopted (such as a short projection period), the change in unit-linked asset holdings from adopting unit matching will also be small, meaning that the approach might not be particularly worthwhile. And indeed looking at the regulatory balance sheet for these companies, we see that in all cases there is very little difference in the value of assets held in respect of unit-linked liabilities and the value of the unit-linked technical provisions.

A further factor which will influence the decision of whether to implement unit matching is the primary metric used by the company to inform decision making. If the key metric is its solvency position (as measured using the Solvency II balance sheet) then unit matching (as a mechanism to hedge the market risk arising on unit-linked business) will look more attractive than if the company manages its business primarily to achieve a stable International Financial Reporting Standard (IFRS) profit. Some of the firms that have not adopted unit matching may be of the latter variety.

COMPANIES WHICH USE DERIVATIVES ONLY

The next category of unit-linked insurers are those that employ derivatives to mitigate the shareholder exposure to market risk on the unit-linked funds, but have not (yet) implemented unit matching. All of the firms in this category, which include Liverpool Victoria Financial Services, Royal London and Zurich Assurance, describe the purpose of the hedging as to protect the value of future expected AMCs from adverse movements in equity prices. The application of equity put options and total return swaps to protect future surplus emerging on unit-linked business is discussed and compared to unit matching in Section 5.

In considering why these firms currently only use equity market hedging instead of unit matching or without unit matching alongside the hedging, the principal reasons are likely to be as follows:

- Although it can (successfully) be argued that unit matching under Solvency II is effectively an extension of actuarial funding, which was widely implemented under the previous UK insurance regulatory regime, unit matching itself is only as old as the Solvency II framework, whereas the concept of hedging the market risk on unit-linked business is much better established. Some firms will have introduced hedging programs before unit matching became a credible option and, under the assumption these programs are proving to be effective, they may not consider there to be a strong business case for a change in approach.
- For firms that have more recently introduced hedging, they will have had the opportunity to consider unit matching as an alternative (or complementary) approach to managing the market risk on unit-linked business before proceeding. These firms may have concluded that, although unit matching is potentially more effective as a hedge against market risk than derivatives, the additional benefit (if any) may not justify the greater operational cost—in practical terms—of implementing a unit matching framework.
- Finally, and as we explore later in the report, unit matching also serves as a source of liquidity as it effectively changes the illiquid asset of future AMCs into a liquid asset of cash. The firms who have not made use of unit matching may not have as great a need (or desire) for accessing additional liquidity and may strategically (or perhaps philosophically) be more comfortable accessing the surplus as it emerges over the life of the unit-linked contracts.

COMPANIES WHICH USE BOTH UNIT MATCHING AND DERIVATIVES

Our final subgroup of the large unit-linked businesses in the UK life insurance market are those firms that have implemented a unit matching program at the time of or following the introduction of Solvency II. To our knowledge all of these firms also employ derivatives (held outside the unit-linked funds) to manage market risk.

Reviewing the 2019 SFCRs for the three companies that have publicly disclosed their use of unit matching³—Scottish Equitable (Aegon UK), ReAssure, and Scottish Widows—the stated rationale for adopting unit matching is consistent across these firms. Unit matching is described first and foremost as a risk mitigation tool to limit the risk of equity market falls reducing future AMC income (as well as any expenses also linked to the value of funds under management), rather than as a means to accelerate the timing of the cash flows on the unit-linked business. In our experience, liquidity is likely to have been a material driver of unit matching but having been implemented the approach is then viewed internally as risk mitigation. Also consistent across the SFCRs, unit matching is in all cases described directly alongside equity hedging, demonstrating that for each firm the two techniques are viewed as part of a combined strategy to mitigate market risk rather than separate programs. Where equity hedging was already in place, unit matching allows firms to remove (or reduce) any residual equity risk on the funds that have been hedged or can be applied to unit-linked funds that were not amenable to hedging due to material basis risk. This is explicit in ReAssure’s 2019 SFCR, which states that the company has mitigated equity risk by “*hedging part of the portfolio against adverse movements using equity futures and has recently adopted a unit matching strategy to further mitigate equity risk.*” We also see from the ReAssure Group’s 2019 Annual Report that derivatives and unit matching are implemented to ensure that the equity risk exposure arising on unit-linked business remains within risk appetite tolerance.

In terms of further specific observations, the SFCR for Scottish Widows notes that “*unit matching is adopted on a significant proportion of unit-linked business*” and that “*equity risk is much less significant than previously due to the adoption of unit matching and the presence of a substantial equity hedging programme.*” This messaging confirms the potential for unit matching to materially reduce the equity risk arising on unit-linked business that the own funds position would otherwise be exposed to. Scottish Widows also notes in its 2019 Report and Accounts that unit matching to the Solvency II view of policyholder liabilities creates a mismatch between the value of its assets and liabilities on an IFRS basis. We would not typically expect the impact of unit matching on a firm’s accounting position to be a barrier to implementation, but nevertheless the additional volatility or change in revenue profile that unit matching potentially introduces should be a key feature of a firm’s unit matching governance framework.

Scottish Equitable refers to its implementation of unit matching in a number of different sections of its 2019 SFCR. In addition to the section on exposure to and mitigation of equity risk, unit matching is noted in the context of adherence to the Prudent Person Principle, managing liquidity risk and as a key component of the company’s strategy to “*maintain capital at an appropriate level as protection for policyholders.*” Scottish Equitable also makes reference within its SFCR to the operational and governance aspects associated with unit matching, noting “*quarterly rebalancing of the position*” and “*regular review and oversight.*”

As noted previously we are aware of a small number of additional firms that do not publicly disclose their use of unit matching, and more generally, in summarising the current level of adoption in the UK market, it is now the case that a good proportion of the insurers with the largest blocks of unit-linked businesses, and therefore the strongest business case for unit matching, have either already implemented it or have reviewed the approach and have decided not to proceed. However, we believe there is still scope in the UK market for further implementations, either new implementations by the remaining firms (for which the obstacles discussed above do not apply) or for extended use by the firms that have already embedded a unit matching framework.

³ We note here that we are aware of a number of other large UK insurers with significant blocks of unit-linked business that have also adopted unit matching, but which do not publicly state so in their recent SFCRs.

3. Key elements of a unit matching framework

Based on Milliman's experience of working with clients on unit matching implementations, we suggest the following areas are key to consider when establishing a strategy and framework:

- Unit matching objectives (including risk considerations).
- Alternative mechanisms.
- The scope of unit-linked business included.
- The timing of implementation.
- Policyholder considerations.
- The regulatory scope for unit matching on Solvency II basis and Solvency II reporting implications.
- Calculation of excess unit-linked assets.
- The unit matching buffer.
- Fund management.
- Box management.
- The approach to managing and monitoring the unit matching position.
- Information technology (IT) implications.
- Internal stakeholder and regulatory engagement.
- Management of asset sale proceeds.

UNIT MATCHING OBJECTIVES

Identification and prioritisation of key objectives and success criteria for unit matching is the first and most important step to take. There is a wide range of options when it comes to designing and implementing unit matching and so this will direct much of the activity undertaken with respect to other aspects of the strategy. This includes what alternative mechanisms to unit matching could be considered, how the "unit matching buffer," an additional holding of unit-linked assets above that strictly required, should be calibrated and how unit sales proceeds will be managed.

Unit matching provides the ability to safely sell some unit-linked assets and reinvest the proceeds in alternative, more attractive ways. Depending on a firm's specific circumstances, key objectives might include:

- **Access to significant additional liquidity:** A firm may choose to hold more liquid assets, such as cash, to more readily react to adverse events. Within a group structure, this might be particularly useful in order to support other group entities. A firm can also use the liquidity to better pursue its strategic objectives such as paying dividends, writing new business or growing through acquisitions. It is worth highlighting, however, that unit matching provides a benefit today in exchange for future liquidity and, if implementing unit matching now, a firm is effectively recognising the full future AMC income on in-scope unit-linked funds. Furthermore, the extent to which the liquidity benefit can be "used up" will depend on the calibration of the unit matching buffer. Specifically, if the unit matching buffer only provides cover for short-term volatility then liquidity cover will be needed for the risk of future buybacks of unit-linked assets due to adverse experience over the longer term.
- **Reduced capital requirements:** A firm may look to reduce market risk by reinvesting excess unit-linked assets in less risky assets, assets that better match the nature and duration of its liabilities or assets whose risk diversifies more effectively against the firm's other remaining market risks. For example, by more closely matching the asset and liability sides of the balance sheet with respect to equity, the equity risk submodule under the standard formula could be reduced significantly. However, there will likely be a consequential increase in another risk submodule, such as counterparty default or spread risk, depending on what alternative assets are chosen, so the reduction in one constituent of the Solvency Capital Requirement (SCR) should be weighed against any increases elsewhere. Furthermore, the effect on the aggregate SCR may be dampened by a loss of diversification between market risk and the firm's other risk classes, increasing the prominence of nonmarket risks in terms of their contributions to required capital.

- **Own funds optimisation:** In addition to reduced capital requirements, reinvestment into different, less risky assets can improve the ongoing stability of own funds. Furthermore, in the absence of unit matching, the firm is effectively outsourcing the investment strategy for a proportion of its own funds to its unit-linked policyholders. This is unlikely to produce an optimal investment strategy from the firm's perspective and therefore reinvestment in alternative assets might achieve a more favourable investment return without breaching the firm's risk appetite.
- **Lapse risk management:** Unit matching provides some mitigation in a scenario where an increase in surrenders follows a fall in unit prices, a benefit that the ongoing COVID-19 pandemic may prove to highlight. However, it's important to note that this dynamic reverses if increased lapses follow a rise in market prices—this risk would need to be considered via the Own Risk and Solvency Assessment (ORSA) and if deemed significant then a partial internal model may be required.

As alluded to in the examples above, it is important to consider objectives in the context of both the potential benefits and the potential challenges associated with unit matching. In particular, unless a unit matching buffer is held that at least covers the part of the SCR (and any capital buffer) that is sensitive to changes in unit pricing, unit matching can cause the solvency ratio to behave in unfamiliar ways. Depending on the firm in question, there may or may not be an appetite for this. Solvency II is not the only metric that matters though. Firms will also need to consider the impact on the accounting position—this may become more volatile due to unit-linked assets no longer matching unit-linked liabilities on an accounting basis and ongoing operating profit may be lower due to the loss of future AMC income on in-scope unit-linked funds.

Another thing to consider is the need for enhanced monitoring and reporting, new reconciliation and rebalancing processes, risk management, governance and operational changes and any necessary systems development or upgrade work. All of these things will involve a cost and a resource commitment as well as some level of business or project risk, with the complexity of the implementation generally depending on the number and diversity of the in-scope unit-linked funds and products. For this reason, firms may choose to restrict the implementation to blocks of business that have relatively straightforward benefits and stable experience, and which are held on platforms that have both flexibility and scalability.

ALTERNATIVE MECHANISMS

Whatever a firm's objectives for unit matching, whether they are related to liquidity, capital, profitability or risk management, there will undoubtedly be alternative mechanisms to achieve them and firms should consider the benefits and challenges of these mechanisms when compared to, or used in conjunction with, unit matching. This is considered further in Sections 4 and 5.

THE SCOPE OF UNIT-LINKED BUSINESS INCLUDED

Once the key objectives and success criteria for unit matching have been identified and potential alternative strategies have been considered, firms will need to establish criteria to determine eligible business blocks and details of business excluded and why. This step would include an assessment of the feasibility and net benefits of unit matching in the context of different fund and product features.

Unit matching will only be justified where there is potential for material benefits, with this potential tending to increase in line with the amount of unit-linked assets that can be disinvested. The primary factor in determining the degree of permitted disinvestment from unit-linked assets is the size of the present value of future AMCs in excess of unit-related expenses relative to the corresponding surrender value of the in-force unit-linked contracts. For products where this is relatively small, there will typically only be limited scope for disinvestment and therefore less potential benefit from unit matching. This is likely to be the case where the profit margin between AMCs and unit-related expenses is small or where cash flows are only projected over a short period due to, for example, firms having unilateral rights to terminate their unit-linked contracts or a high surrender rate (for, say, group business).

Additionally, where lapse experience has historically been very volatile or is difficult to predict and hence likely to be subject to revision (for example, for new funds or products) the risk of unit-linked assets falling below the value of unit-linked technical provisions and the costs of rebalancing the position may outweigh the potential benefits. Switching is a similar phenomenon and if, for example, funds are likely to have high switch rates by nature or perhaps due to the development of new alternative funds then they may not be suited to unit matching.

It is also worth considering the impact of surrender penalties on the level of unit-linked assets that firms held under Solvency I and continue to hold now. Where material surrender penalties apply and firms have historically reduced their holdings in unit-linked assets accordingly, and thus have already taken some credit for the difference between the full face value of policyholder units and the unit-linked technical provisions, the potential benefits from unit matching will be reduced. A similar point can be made where firms have historically used substantial actuarial funding, in which case unit matching might be viewed as an evolution of an existing process.

So, in summary, examples of features for which unit matching is likely to yield the highest potential benefits include:

- Insurers with big blocks of in-force unit-linked business.
- Large, growing funds.
- Retail business rather than group business.
- Business with stable experience.
- Products with low or no surrender penalties or firms that have not reduced unit-linked asset holdings to reflect surrender penalties.
- Products with higher AMCs and unit margins.

There are also a number of potential fund and product-specific exclusions worth mentioning. There may be potential tax and/or trading issues associated with disinvestment that could give rise to policyholder fairness issues, for example with mixed life and pension funds or property funds where there is a need to sell an entire property to implement unit matching. Certain products may allow policyholders to invest in quite bespoke portfolios of assets, which could lead to considerable practical challenges implementing unit matching. Some funds could also be held on legacy platforms that are inflexible, due to be replaced or of limited scale, in which case unit matching may be too costly or impractical. Finally, provisions in schemes of transfer, schemes of arrangement or schemes of demutualisation may necessitate the exclusion of the blocks of business to which these schemes apply.

THE TIMING OF IMPLEMENTATION

In some cases, firms may choose to opt for a "phased" approach, initially implementing unit matching for just a small subset of funds for which the potential benefits are greatest and the implementation process is considered relatively straightforward. This approach allows firms to reflect on key successes and lessons learned before making decisions on whether to extend the implementation to other funds for which a unit matching strategy may be less rewarding and/or more complex. It also allows time to undertake any necessary analysis, systems development or upgrade work and other actions needed for specific blocks of business without unduly holding up the implementation and recognition of associated benefits for other areas. However, in many cases, it is more practical and cost-effective to implement unit matching in one phase rather than going through the process (from strategy setting to approvals to calculations, testing and go-live) multiple times.

Similarly, firms may put a unit matching framework in place but not actually disinvest excess unit-linked assets until such a time as additional liquidity or further balance sheet stability is needed. Such flexibility is valuable as the development and implementation of the framework takes considerable time and, unless this work has been done in advance, unit matching will not be available as a management action in the near-term.

Market movements are another key consideration. In particular, firms will not want to lock in to unfavourable market values at the point of implementation so a degree of flexibility may be needed here.

POLICYHOLDER CONSIDERATIONS

We would expect firms to be able to confirm, having obtained legal advice, whether product documents permit unit matching and propose measures to address possible issues or necessary changes to published disclosures. In the UK life insurance industry, we are not aware of any cases where the product terms and conditions are considered to prohibit unit matching. Further, it is clear from our experience that most of the major unit-linked insurers have implemented some level of unit matching so it is now routinely the case that firms hold lower values of unit-linked assets than the total surrender value of their unit-linked contracts. However, as described in Section 7 of this report, firms may face significant legal, regulatory or other barriers in different European markets.

Unit matching is a shareholder-driven activity that is independent of any policyholder requirements (subject to there being nothing in policy terms that it contravenes). Consequently, the policyholder should not suffer any material adverse consequences that are exclusively attributable to unit matching and firms will need to establish a planned approach with respect to all potential policyholder fairness issues to demonstrate that this is the case. In particular, this would include details of fairness considerations for trades relating to initial sales of unit-linked assets and ongoing rebalancing trades in the event of stress scenarios. It is important that these trades do not affect the unit price for policyholders nor result in an asset mix that would be other than an acceptable mix in the view of the investment manager.

We would anticipate that approvals for unit matching are required from firms' boards (or a delegated authority) and that customer committees would be informed and given the opportunity to comment on the proposals. It is unlikely that either body would agree to outcomes that are inconsistent with policyholder expectations. From a regulatory conduct perspective, we also suggest advising the Financial Conduct Authority (FCA). From our experience, past notifications to the FCA have been welcomed but have not generated any further interest.

SOLVENCY II-RELATED MATTERS

The regulatory scope for unit matching

One aspect of Solvency II-related considerations is determining the regulatory scope for unit matching, i.e., the maximum extent to which a firm could disinvest from unit-linked assets without breaching the Solvency II rules. This would include establishing the treatment of different elements of the technical provisions, namely how the unit-linked and non-linked components of the best estimate liabilities (BEL) are calculated and the treatment of the risk margin.

There is scope for debate regarding whether or not the wording of the Solvency II rules requires firms to hold unit-linked assets to cover all or part of the risk margin relating to unit-linked business. The Prudent Person Principle section of the PRA Rulebook, which follows from Article 132 of the Solvency II Directive, states that:

“the firm must cover its technical provisions in respect of its linked long-term liabilities as closely as possible with:

(1) where the linked benefits are linked to the value of units, those units;

(2) where the linked benefits are linked to the value of assets contained in an internal fund of the firm:

(a) in a case where the internal fund is divided into notional units, the assets represented by those notional units; or

(b) in a case where notional units are not established, those assets; and

(3) where the linked benefits are linked to a share index or other reference value not mentioned in (1) or (2), assets of appropriate security and marketability which correspond as closely as possible to the assets on which the reference value is based.”

Our view of the intent of the rules is that firms should cover at least the part of the risk margin that is sensitive to unit prices, gross of the transitional measure for technical provision (TMTP). This is on the basis that:

- There is an explicit reference to technical provisions rather than just the BEL.
- The risk margin for a unit-linked policy is mainly attributable to the unit-linked benefits provided by the policy and is sensitive to unit prices,⁴ although we acknowledge that it also has non-linked sensitivities, for example interest rate sensitivity.
- One could argue that the risk margin is a proxy for converting best estimate non-market parameters into market-consistent parameters. For example, using market-consistent lapse assumptions would increase the unit-linked BEL to give a market-consistent liability for unit-linked benefits and this larger market-consistent value would then need to be covered with unit-linked assets.
- The TMTP is not sensitive to unit prices. In particular, it doesn't vary over a two-year span, other than due to run-off or a material change in risk profile that warrants an earlier recalculation, and there are numerous other, non-linked, drivers to its value.

⁴ For example, a large component of the risk margin relates to lapse risk capital, which is sensitive to unit price movements.

Covering the unit-linked part of the risk margin also has the benefit of providing protection against a sudden increase in the risk margin due to an increase in asset markets.

In theory, to maximise the benefits of unit matching while also abiding by (our view of the intent of) the Solvency II rules, we suggest including only the unit-linked part of the risk margin in determining the minimum unit-linked asset holdings required. In practice, however, it may be difficult to split the risk margin into unit-linked and non-linked parts, in which case a more practical approach would be to include the whole of the risk margin. As lapse risk SCR is typically the main component of the risk margin for unit-linked business, this simplification should not lead to a material misstatement.

Reporting implications

Solvency II reporting implications is another important aspect, for example the interaction between unit matching and the TMTP and the treatment of unit matching in internal model calculations.

In theory, internal models should not need to be changed due to unit matching because the BEL does not change and unit matching is simply an asset mix change that, depending on how the excess unit-linked assets are reinvested, may not involve the introduction of new assets. However, certain features may change depending on the way in which the internal model calculates the impacts of various stresses:

- The correlation between a market rise and increased lapses may be of more materiality than previously. This is because a market rise and increased lapses are likely to be of little importance currently, with a market fall and increased lapses being the bigger risk due to a portion of own funds being held in unit-linked assets. Further, there is a need to ensure appropriate allowance for diversification effects. Although companies will have investigated the correlation between market movements and increased lapses, this will mainly be in relation to the combination of a market fall and increased lapses and therefore the need to consider a market rise and increased lapses is likely to be new.
- The operational risk calculation will need to consider the new risks introduced by unit matching.

Indeed, we are aware of firms that have concluded that unit matching necessitates a material change to the internal model, though this may have been due to the significance of the unit matching change in combination with a number of other small changes.

Any resulting risk profile changes are likely to give rise to changes in the value and sensitivity of the TMTP over time. Firms will also need to consider how to reflect unit matching in their TMTP recalculations. The Solvency II and Solvency I Pillar 2 positions behave similarly, hence the comparison of these two measures is reasonably stable, but the impact on the Solvency I Pillar 1 position is less intuitive when performing the Financial Resource Requirements test. Further, with unit matching being a Solvency II concept, it is unclear how to measure the Solvency I capital result using actual asset holdings, which in fact are in breach of the Solvency I rules.

CALCULATION OF EXCESS UNIT-LINKED ASSETS

Key considerations for the calculation of excess unit-linked assets are set out below.

- **Issues arising from differences in legacy systems and/or any merger implications:** Where different funds are held on different systems, data inputs may come from different locations and at different levels of granularity, which may in turn necessitate different (or flexible) calculation approaches and/or levels of approximation.
- **Fund-level approximations:** When implementing unit matching, excess unit-linked assets need to be determined at the level of each unit-linked fund; however, across the industry, it is often the case that Solvency II models do not provide any analysis of excess unit-linked assets at this level. Hence, companies may need to approximate the allocation of excess unit-linked assets across unit-linked funds. Because there is the potential for mis-estimation in this process, firms may wish to calculate a best estimate view and also a cautious view, which would typically be based on "worst case scenario" assumptions that permit a smaller degree of unit matching. The difference between them can then form a component of the unit matching buffer.

The allocation of excess unit-linked assets to each relevant unit-linked fund needs to allow for features in the policies and how they invest in funds, as well as features in the funds themselves. There is a risk that not all of these features are identified. For example:

- Cash and bond funds are likely to have shorter durations than average, due to their typical use as glide-path investments for policyholders approaching retirement who have shorter investment horizons, and lower AMCs, hence less excess unit-linked assets.
 - Some funds may have been marketed to particular groups of customers, which may have implications for the average duration for that business.
 - There may be other distorting features such as AMC caps or lifestyle switching.
- **Treatment of cash flows:** The data and programs used to calculate excess unit-linked assets are subtly different from those used for other Solvency II calculations as they exclude non-linked cash flows and the input data needs to comprise in-scope business only. Therefore, there is a need to ensure that equivalent control and governance is exercised. There may also be a risk that some unit-linked cash flows are wrongly categorised or omitted from consideration due to lack of historical knowledge of the appropriate allocation.
 - **Frequency of calculations:** A quarterly recalculation of the value of excess unit-linked assets should be suitable and is consistent with the industry. It matches the frequency of production of the Solvency II balance sheet data, which underlies the calculation. Further, in conjunction with the unit matching buffer, it should be sufficient to allow firms to identify and react to adverse experience before breaching the Solvency II rules while avoiding the additional costs from more frequent recalculations.

THE UNIT MATCHING BUFFER

Why a unit matching buffer is needed

The value of unit-linked technical provisions should be viewed as a theoretical floor rather than a target level of unit-linked asset holdings. To comply with the Solvency II rules, firms need to ensure that their unit-linked assets are sufficient to cover the unit-linked technical provisions at all times. In practice, however, there will be sources of variation such as actual versus expected policyholder decrements (for example, an adverse lapse event) and interest rate movements (to which the risk margin is very sensitive) that result in unforeseen differences between the value of unit-linked assets and the value of unit-linked technical provisions over time. So, to reduce the risk of breaching regulatory requirements and the need for continuous monitoring and rebalancing of unit-linked asset holdings, a practical approach is to maintain a prudent, fund-specific margin or unit matching buffer by investing more than is strictly required in unit-linked assets.

A unit matching buffer will also permit a degree of estimation error in determining the value of excess unit-linked assets. As discussed above, this has to be determined at the level of each unit-linked fund, which most firms find a challenge to do accurately—they are not required to do this under Solvency II and so are likely to face data, systems and modelling constraints. Often, the necessary or more practical solution is to determine the value of excess unit-linked assets at an aggregate level and make an approximate allocation across unit-linked funds. In this case, a buffer is needed to ensure that, despite the estimation involved, the Solvency II rules are certain to be satisfied for each unit-linked fund.

Other things equal, increasing levels of manual intervention result in higher operational risk and necessitate higher unit matching buffers as it is likely that responsive management actions will be taken less quickly and there may also be more scope for errors. However, in practice, we would expect firms to have robust processes in place to minimise this risk.

Finally, at least a proportion of the SCR will be sensitive to changes in unit prices and, further, a component of the capital buffer held in excess of the SCR to meet a firm's internal risk appetite would typically be considered cyclical or "linked." Therefore, to avoid unwanted volatility in the solvency ratio, firms will usually set a unit matching buffer so that it at least covers the linked elements of the SCR and capital buffer.

Calibration of the unit matching buffer

Key risk components of the unit matching buffer calibration, which should be set at the level of individual unit-linked funds, are set out below. It is important to note that this is not intended to be an exhaustive list but rather some common areas we have seen firms hold a buffer for when implementing a unit matching strategy.

Ultimately, the precise components and calibration of the unit matching buffer will depend on the specific firm and unit-linked business in question and so may differ significantly from those set out below.

- **Lapse risk⁵ and demographic assumption changes:** There are two components to lapse risk in the context of unit matching. The first is the occurrence of increased lapses that would require some buyback of unit-linked assets or a suitable unit matching buffer. The second is the potential resulting basis change, which has a much more material impact on the need to buy back unit-linked assets. We suggest that changes in policyholder lapse behaviour typically emerge gradually over a number of months and that the identification and quantification of any resulting basis change takes several more months. Hence, in our view, this component of the unit matching buffer need only include excess unit-linked assets that are sufficient to cover the period from a 1-in-X-year⁶ adverse lapse event commencing at the point at which management action (the purchase of additional unit-linked assets) would be applied, supported by a formal governance process with defined triggers.

Where a firm implements unit matching by calculating a proportionate reduction to unit-linked asset holdings (a “unit matching factor”) for each in-scope unit-linked fund and applying this unit matching factor as a negative box position, it would effectively be rebalancing its unit matching position for actual decrement and new premium experience as it happens through daily trades. Therefore, the risk of breaching the Solvency II rules due to a change in lapse behaviour would be small, potentially removing the need for a unit matching buffer component for even the initial period of increased lapses in an adverse lapse event. By contrast, where unit matching is applied by calculating and applying a nominal reduction to unit-linked asset holdings at regular intervals, for example each quarter, then the unit matching buffer will need to allow for both expected errors arising out of the discreet quarterly updates and the risk of deviation between actual and expected experience. Further, close monitoring will be required between quarterly updates to ensure sufficient unit-linked assets are held at all times and, in extreme circumstances, rebalancing may be required.

Assuming the unit matching buffer only provides cover for short-term lapse volatility, as we recommend, then liquidity cover will be required for the possible need to buy back unit-linked assets due to adverse experience over the longer term. Hence we would anticipate that the realised liquidity benefit from unit matching would be:

- The proceeds from sale of excess unit-linked assets net of the unit matching buffer, assuming this is held in cash or other high-quality liquid assets.
 - Less the liquidity cover required for an adverse lapse event (or a combined market rise and adverse lapse event if more onerous), net of the cover provided in the unit matching buffer.
 - Plus, if applicable, the release of liquidity cover required for stressed collateral requirements on any derivative hedging that is unwound in response to unit matching implementation.
- **Calculation approximations:** As mentioned previously, the value of excess unit-linked assets may be understated or overstated on a fund-by-fund basis due to approximations used in the calculation, in which case it would be necessary to estimate the maximum possible error introduced by these approximations and hold this amount as a component of the unit matching buffer.
 - **Manual intervention and operational risk:** In order to set an appropriate buffer component for operational risk, we recommend that firms consider errors that could occur at each point of manual intervention and their potential implications on the unit matching position. However, we would expect there to be robust processes in place to monitor unexpected movements in unit matching factors and any errors in the application of these factors and so we would not expect this risk to be significant in practice. Cost-benefit analysis will help firms to determine the point at which the cost of increased control automation and monitoring is not worth the benefits of holding a lower unit matching buffer.

⁵ The risk of rapid loss of a significant proportion of the in-force business and the potential establishment of a provision for further significant lapses. Although this content is specific to lapse risk, similar logic applies for other policyholder decrements such as deaths and switches.

⁶ The value of X would be set to be consistent with the firm’s risk appetite.

- **Risk margin changes:** Assuming firms include the risk margin (or a component of the risk margin) in deriving the minimum unit-linked asset holdings required, a component of the unit matching buffer should reflect the sensitivity of the risk margin to interest rate movements. In particular, there is a risk that a sudden fall in rates would increase the risk margin and the minimum unit-linked asset holdings required, and potentially give rise to a breach of the Solvency II rules. We suggest that firms assess their exposure to a fall in interest rates and set an appropriate buffer component in respect of this risk. For example, the buffer component could be set at a level to allow the firm to withstand a 1-in-X-year interest rate fall without breaching the Solvency II rules.

We recommend that the different components of the buffer be determined on a best estimate basis and any extra cushion applied at an aggregate level. This approach avoids excessive accumulation of prudent margins while providing some headroom to limit frequent buying and selling of unit-linked assets. As mentioned previously, to hedge the unit-linked elements of the SCR and capital buffer, firms may also want to ensure that their buffers are at least sufficient to cover them.

The process for setting the unit matching buffer should be thoroughly documented and reviewed, and the level of the buffer should be monitored on an ongoing basis and reviewed and updated (if necessary) at least annually or following a material change in the profile of the unit-linked business or the firm's risk appetite. The changes that would trigger a review of the buffer should be set out within the process documentation.

Risks associated with the unit matching buffer

Key risks associated with the unit matching buffer are set out below.

- Overestimation of the unit matching buffer limits the opportunity to generate liquidity, capital and other benefits associated with unit matching.
- Underestimation of the unit matching buffer risks breaching the Solvency II rules, for example underestimating the unit matching buffer due to omission of some sources of approximation in the calculation of excess unit-linked assets.
- Failure to track experience variances adequately risks failing to take management actions in a timely manner, potentially leading to a breach of the Solvency II rules.
- Failure to apply unit matching buffers correctly, at fund level, risks breaching the Solvency II rules.

FUND MANAGEMENT

Firms will need to establish the methodology for applying the approved level of unit matching, and how the required unit reductions flow through to trade instructions and ongoing asset holding requirements, including management of fund of funds.

Standard industry practice is to establish theoretical and practical unit matching factors for each unit-linked fund, the former being the maximum proportion of unit-linked assets that can be sold in theory and the latter being a lower proportion reflecting the agreed unit matching buffer. The practical unit matching factors are then applied to the required unit-linked asset holdings extracted from policy records and so reduce the unit-linked asset holdings targeted through the box management process. Applying unit matching factors in this way utilises the existing purpose of box management to hold back trading instructions for a few days to accumulate a number of small buy or sell instructions so that trades in unit-linked assets are transacted in meaningful values and a number of buy or sell instructions are netted off.

The fund accounting process may have a number of underlying unit-linked funds (base funds), some of which are funds of funds. There may also be a second layer of sub-funds allocated to policies, each invested in a single base fund but with different annual management charges applied. It should not matter whether the base funds or the sub-funds are reduced by unit matching factors but the choice of approach may have implications for other processes. For example, if administration and reporting systems extract unit-linked fund data at sub-fund levels, it may be better to apply the unit matching factors at the base fund level only, if this avoids impacting servicing, accounting and actuarial data. Alternatively, two sets of records could be maintained, one without unit matching factors applied and one with, which may require some level of systems development.

Normally, we would expect firms to use proportionate unit matching factors, which has the advantage of continuously rebalancing the unit matching position through daily trades. However, we are aware of firms that calculate unit matching factors as a number of units to be deducted at agreed intervals, usually each quarter. In either case, firms will need to create a system to calculate and regularly update the unit matching factors.

BOX MANAGEMENT

Box management considerations should cover the approach to ongoing sales and purchases of unit-linked assets to maintain the level of required unit matching, for example using policyholder premiums and claims to reduce sales and purchases, and the approach to differing levels of sales and purchases due to initial implementation, following stress events and following board-approved changes to the level of unit matching. In both cases, justification will need to be provided for the agreed approach.

As mentioned previously, policyholders should not suffer any adverse consequences that are exclusively attributable to unit matching. However, we believe it is acceptable to recognise that the shareholder does exercise discretion in box management and in managing the asset mix of the unit-linked funds. Indeed, these activities are beneficial to policyholders because they respectively manage down trading expenses incurred and the risks taken by the unit-linked funds and hence the costs incurred and risks taken by policyholders.

A possible approach is to consider unit matching trades as either substantial trades requiring a specific trading action (for example, on initial implementation or expansion of the scope of unit matching) or as smaller trades that can be managed using tolerances in the box management.

- The substantial trades could, insofar as possible, be done in a manner that does not affect the unit price for policyholders, resulting in an asset mix that would be other than an acceptable mix in the view of the investment managers. In particular:
 - Unit matching trades should not reduce liquidity in the unit-linked funds nor change the asset mix to one that is inconsistent with policyholder communications.
 - Firms could explicitly identify and apply shareholder sale proceeds (net of trading costs incurred) or purchase contributions insofar as possible. This would ensure the impact of sales or purchases on unit prices is neutral, there are no consequences for bid/offer pricing and the risk of errors in determining policyholder benefits is minimised.
- Smaller effects arise from regular rebalancing of unit-linked asset holdings to reflect actual versus expected experience, which will modify the timing of trades instructed by the box management team. However, this could be viewed as no different to the ongoing impact of box management, where the timing of trades is modified compared to that which would arise if every single policyholder instruction were exercised on the day of instruction.

THE APPROACH TO MANAGING AND MONITORING THE UNIT MATCHING POSITION

The key areas of monitoring that we would expect firms to consider are as follows:

- Enhanced decrement monitoring and reporting with the aim of identifying situations that require management action.
- New monitoring of unit-linked funds and the procedures that calculate and apply unit matching factors and unit matching buffers.
- New reconciliations to ensure unit-linked asset holdings reconcile to policy records, allowing for intended unit matching adjustments.
- Reporting requirements for the results of these control procedures and reconciliations.

It is likely that firms will need increased automation and expansion of controls and ongoing monitoring activity as the number and diversity of the in-scope unit-linked funds and products increases and/or as the scale of unit matching increases within the in-scope unit-linked funds. If the intention is to have a "light touch" approach then the implications for the unit matching buffer will need to be assessed as described earlier in this paper.

The results of controls and monitoring activities would typically be reported regularly to a suitable oversight committee such as a finance committee or an asset liability management committee, with less frequent reporting to a board committee. Although interest may be heightened initially, we would expect ongoing reporting to be part of a package of indicators provided to such committees and action taken only if some adverse feature were highlighted by the reporting.

IT IMPLICATIONS

IT implications may vary considerably depending on firms' existing architecture but key considerations include:

- Source of the unit matching calculation routine and details of the parameters used by the calculation routine.
- Details of the position of the calculation routine within an IT flow diagram showing source of inputs and use of outputs.
- Data or program version controls.
- Source of the policy data extract routine.
- Location of the calculation routine within the IT suite of systems. Options include the actuarial valuation suite and the fund management and pricing suite.
- Approach to identifying all required outputs, for example inputs required for fund management and data for tracking, reporting, reconciliations and controls.
- Approach to modifying fund management and pricing routines, for example translation into actions required of the asset management and box management teams.

OTHER CONSIDERATIONS

Internal stakeholder and regulatory engagement

It is important that the board, governance committees and other key stakeholders across the business (for example affected first-line teams) are fully informed and engaged with the process. To support this, firms implementing a unit matching strategy should arrange regular training at various levels of the organisation so that relevant staff understand the operational changes and the board and senior management understand the capital, liquidity and risk implications, as well as the policyholder implications.

We recommend notifying the regulators of any plans to introduce or extend unit matching together with details regarding policyholder fairness, controls, management and governance. Additionally, the regulator may be interested in the implications for the internal model (if there is one) and TMTP calculations. In the UK, from what we have seen, firms have not had any major problems with the regulators in relation to implementing unit matching.

Management of asset sale proceeds

Consideration should be given to how proceeds from the sale of excess unit-linked assets will be managed. As mentioned in our discussion on unit matching objectives, there may be various SCR impacts depending on how the proceeds are reinvested, for example reductions in certain SCR constituents, increases in other SCR constituents and resulting changes to diversification benefits. Further, if the unit matching buffer only provides cover for short-term volatility then liquidity will be needed to fund necessary buybacks of unit-linked assets in potential future stress events. Hence not all of the proceeds may be readily deployable, for example to fund dividends or other strategic initiatives.

4. Alternative capital management strategies

As explained in Section 3, it is important to decide on the objectives of unit matching at the outset.

Unit matching programs can lead to a near-term increase in available liquidity and to a reduction in exposure of own funds to unit price movements (which may both reduce the SCR and stabilise own funds), helping manage lapse risk exposures.

However, there are several other capital management strategies available to insurers for unit-linked business, which can achieve all or some of these objectives. Firms should consider the pros and cons of these different strategies, depending on their desired objectives, and how these different strategies may complement one another.

Milliman consultants set out a range of innovative capital management solutions under Solvency II in a 2019 paper written with Securis Investment Partners, "[A Capital Management Toolkit for Life Re/Insurers.](#)" Here we consider those strategies particularly applicable to unit-linked business and to the aims of unit matching.

These alternatives typically involve external transactions, either via capital market instruments or through reinsurance. This will typically come with transaction costs, including a risk or profit margin paid to the counterparty, whereas unit matching is an internal transaction and so may be more cost-efficient (subject to the, often non-negligible, internal costs of implementation).

Against that, purely internal transactions do not, of themselves, actually transfer any risk outside of the insurer: even in terms of reducing sensitivity to unit price movements, it is the external sale of excess unit-linked assets that achieves this, not the process of unit matching itself.

DERIVATIVE HEDGING

Unit matching can reduce the insurer's SCR sensitivity to unit price movements if the excess unit-linked assets are sold.

A common alternative to achieve the same objective is to maintain excess unit-linked assets but hedge sensitivities outside of the unit-linked funds, for example at shareholder fund level. Given that, in this case, no cash is freed up, this is typically achieved with derivatives.

Derivative hedging is therefore typically done as an alternative to unit matching.

This is considered further in Section 5.

VALUE-IN-FORCE SECURITISATION

Unit matching essentially involves selling excess unit-linked assets that match the value of future expected net AMCs due from policyholder contracts to the shareholder (or other capital provider).

An alternative is value-in-force (VIF) securitisation. This involves an external counterparty essentially advancing funds against the security of future net charges (or profits) from a block of business. In contrast to unit matching they are typically net charges from all sources, not just those linked to unit values.

A typical deal might involve advancing 50% of future net charges expected over the next five years. Deals are often structured so that, in economic effect, the amount advanced accrues with interest, is repaid from actual future charges, and the deal terminates at some fixed end point with the counterparty suffering losses if insufficient net charges have emerged.

VIF securitisation was a common capital management solution under Solvency I as it typically had a direct solvency benefit on available capital: the regulatory balance sheet did not anticipate future profits, and a loan whose payment was contingent on the emergence of future statutory profits was not required to be treated as a liability. Given improving solvency capital was often the main motivation, these deals were sometimes cashless.

Under Solvency II, this is not the case: future charges are typically projected on a best estimate basis (but see the Contract Boundaries Reinsurance section below) and so are already reflected in own funds. Also, loans are typically valued under IFRS.

However, VIF securitisation can still have benefits, in particular to provide liquidity in respect of future AMCs. This is most often seen for financing of new business strains, or for acquisition finance when blocks of business or whole companies are acquired. However, it could also be applied by insurers desiring liquidity for their in-force business as an alternative to unit matching.

VIF securitisation typically involves the insurer retaining most risks associated with the business—the deals are structured so that the amount advanced is expected to be repaid in most circumstances. However, there is transfer of tail risks of lapses and/or market movements, which may cause the counterparty to suffer losses, and there can sometimes be a SCR benefit depending on where the advance is struck.

LAPSE REINSURANCE

The standard formula of Solvency II includes a SCR in respect of lapse risk based on the worst of three scenarios:

- A one-off mass-lapse scenario of 40% of business (70% for group business).
- An increase in lapse rates to 150% (+50%) of best estimate rates.
- A reduction in lapse rates to 50% (-50%) of best estimate rates. This scenario is typically onerous where contracts have generous guarantees or penal surrender penalties, or where future charges are expected not to cover expenses.

Similar requirements may also be applied in internal models.

Lapse reinsurance solutions are designed to provide SCR relief against lapse risk, typically by covering tail risk on extreme lapse scenarios. As an example, a typical mass lapse deal may provide a payout if excess lapses over a rolling one-year period exceed 20%, with a cap at 40%. Such transactions have been implemented by a number of insurers across Europe,

It is less common for small variations in lapse risk to be transferred to reinsurers, unless this is part of a quota-share deal where all risks and rewards are transferred on a pro rata basis. Lapse reinsurance solutions are also typically designed to exclude the impact of market movements.

In contrast, unit matching does not provide lapse SCR relief but provides some mitigation in a combined scenario where an increase in surrenders accompanies a fall in unit prices.

Hence lapse reinsurance and unit matching may have different and complementary impacts on lapse risk management.

CONTRACT BOUNDARIES REINSURANCE

Under Solvency II, certain future premiums are regarded as falling outside of the "contract boundary" and, in this case, the premium, and the associated charges, expenses and benefits, should not be taken into account in setting technical provisions.

A typical example is recurrent single premium contracts where the insurer has the right to vary charges for future premiums: each premium is regarded as constituting a separate contract.

Where contract boundaries apply, the future net charges associated with these future premiums cannot be released via unit matching, because, as stated, they are not reflected in technical provisions.

A potential solution for insurers looking to raise liquidity and/or an own fund benefit from these future charges is to enter into a contract boundaries reinsurance trade. This is essentially a variation of a VIF securitisation, where an amount is advanced, often structured as a reinsurance commission, which is not repayable if future premiums and their associated profits do not materialise. This may be done on a cashless basis if the insurer does not require liquidity.

Contract boundaries reinsurance is therefore effective in this scenario whereas unit matching can only be applied to future charges relating to existing premiums.

CONCLUSION

Insurers should consider unit matching as one approach as part of a holistic view of capital management for unit-linked business.

There are a number of alternative capital management tools. Depending on the insurer's objectives, some of these tools represent a direct alternative to unit matching, others complement it, and some apply where unit matching does not.

As mentioned in Section 3, the full benefits of unit matching need not be taken immediately. Once a unit matching program is in place, an insurer would have flexibility to use this to provide access to liquidity when required, or to de-risk exposure to unit price movements if risk appetite changes. However, given the time taken to establish a unit matching program, the necessary groundwork on the issues discussed in Section 3 would need to be done in advance.

5. Interaction with hedging strategies

One potential advantage of unit matching is that it more closely matches unit-linked asset holdings to the unit-linked component of technical provisions, which should reduce the sensitivity of Solvency II own funds to changes in unit prices. In particular, it reduces the insurer's exposure to falls in unit prices, which reduce the value of future management charges (income) more than that of future outgo (expenses, which are largely not linked to unit prices).

For insurers wanting to reduce their exposure to changes in unit prices, an alternative is to hedge the sensitivity to unit prices outside of unit-linked funds. This is typically done with market instruments such as equity futures (here we have assumed for simplicity that unit-linked funds are invested in equities). If the insurer sells equity futures then the value of the "short" position will increase (or reduce or become more negative) as equity prices fall (or rise) and this can be designed to match the sensitivity arising from the unit-linked funds.

In the table below, we contrast the different features of the two approaches:

AREA OF FOCUS	UNIT MATCHING	HEDGING OUTSIDE OF UNIT-LINKED FUNDS
Liquidity	Liquidity is created, albeit there is a need to ensure sufficient liquidity is retained to buy back unit-linked assets if needed (for example, following increased lapses). Future liquidity generation, from emerging charges, is also reduced.	Hedging can give rise to liquidity strains, for example to fund collateral calls as equity prices rise.
"Basis risk," i.e., risk that the unit price and hedge behave differently	Minimised as unit-linked assets are matched with the appropriate unit-linked funds.	Present, as available market hedges often do not match the underlying unit-linked assets.
Constraints	Constrained by Solvency II rules, so requires robust monitoring.	Freer to under-hedge or over-hedge as desired as hedging is outside unit-linked funds.
Accounting	Accounting treatment is more favourable, in that it does not require use of derivatives. However, it can give rise to mismatches when Solvency II and IFRS are not aligned.	Potential accounting volatility from use of derivatives, which are typically treated differently from unit-linked assets and technical provisions.
Metrics	Focused on, or at least constrained by, the need to match Solvency II technical provisions. Extent of unit matching could be adjusted down (but not up), if required, for example to cover the linked element of the SCR with unit-linked assets.	May extend to wider metrics: <ul style="list-style-type: none"> ▪ Within Solvency II, the insurer has more flexibility to choose the hedging metric, for example how to treat the risk margin, TMTP and SCR, and whether to stabilise own funds or the SCR ratio. ▪ Hedging may also focus instead on other metrics, for example IFRS or embedded value.
Accounting	Simple—involves reducing exposure to unit-linked assets.	More complex and tailored strategies are possible, in particular if using options. For example, the insurer may choose to protect against only large falls, or to protect against downside risk

Based on this, best practice may involve combining unit matching and hedging outside of unit-linked funds into one integrated framework.

- Unit matching is employed to the maximum level considered acceptable and to reduce Solvency II sensitivity to a desired level. This maximises the freed-up liquidity and minimises basis risk.
- Hedging outside of unit-linked funds is then layered on top to adjust the hedges as desired for different metrics or approaches.

In Section 6, we consider a particular example of hedging: the hedging of options and guarantees.

6. Unit matching for contracts with options and guarantees

As a recap, unit matching essentially involves the firm holding unit-linked assets to match the unit-linked part of the Solvency II technical provisions, rather than the face value of unit-linked funds on the policyholder account. And, typically, Solvency II technical provisions have less unit-related exposure than the policyholder account, due to the value of future management charges.

In this section, we consider how unit matching might be applied to a more complex class of unit-linked business, namely contracts with options and guarantees.

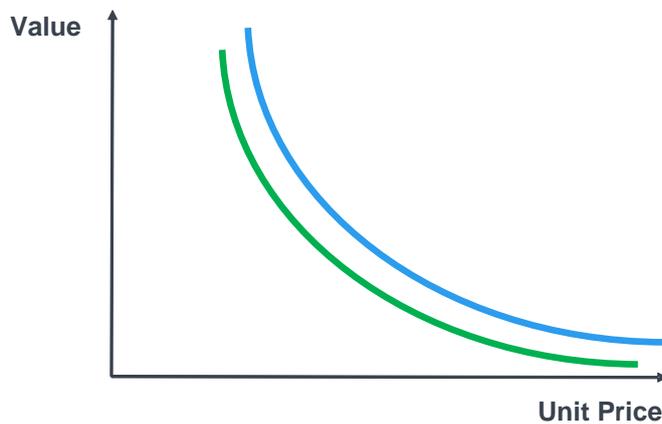
For example, consider a simple unit-linked contract with a maturity guarantee, such that the maturity value is equal to the premium paid. In our simple example, we will assume there are zero unit charges, and no surrender value.

Then the Solvency II technical provisions will equal:

- The unit-linked funds held by the policyholder, *plus*
- A put option on the value of those unit-linked funds.

The value of that put option will itself depend on the price of the units—as unit prices fall the value of the guarantee increases and vice versa as shown in Figure 1.

FIGURE 1: VALUE AND UNIT PRICE



Hence although the guarantee increases the value of technical provisions it also reduces the sensitivity of technical provisions to unit prices. In other words, the policyholder does not benefit from the full increase of unit prices as this also reduces the value of the guarantee.

In theory, then, unit matching could also be applied to these technical provisions even though there are no corresponding future unit-linked charges. The amount of unit-linked assets to back technical provisions would be lower than the unit-linked funds credited to the policyholder account. The balance of technical provisions might be held instead in near risk-free zero-coupon bonds to match the maturity guarantee.

For the technically minded, this essentially is the replicating portfolio resulting from the Black-Scholes formula used to value the put option—a long position in risk-free bonds and a short position in unit-linked assets (i.e., holding fewer unit-linked assets), where the sensitivity of the put option to the unit price is known as the "delta" of the option.

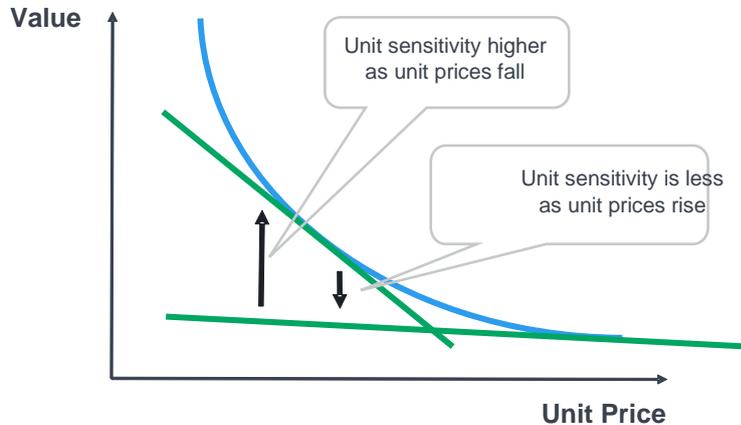
Potentially using unit matching in this way provides an effective hedge of the guarantee—for example, as explained in Section 5, it reduces the basis risk compared to more conventional hedging strategies. It may also provide a solution where put options (which would provide a more precise hedge) are not available.

However, when we look again at Figure 1 we notice another factor. The slope of the curve changes—i.e., the sensitivity of the value of the guarantee to changes in unit prices itself also changes with unit prices.

Specifically, and as shown in Figure 2:

- As unit prices rise, the sensitivity to further unit price rises becomes less
- As unit prices fall, the sensitivity to further falls becomes higher.

FIGURE 2: UNIT SENSITIVITY



Again, for the more technically minded, this is a well-known result from the Black-Scholes formula to value put options, and is known as the "gamma" of the option.

This is a different situation from when unit matching is used for unit-linked management charges; the value of a management charge of 1% of unit-linked funds remains at 1% of the value of unit-linked funds, irrespective of the unit price.

The implication is that any use of unit matching to hedge the value of options and guarantees will have to be applied dynamically, and the amount of unit matching adjusted regularly and, in particular, in response to changes in unit prices. And as we have seen in March 2020, stock markets prices can show marked swings, even intraday.

Note also that:

- To ensure full hedging of options and guarantees, the unit matching would need to be adjusted for market falls and rises.
- However, to ensure compliance with the Solvency II rules, it is only necessary to ensure that the unit matching is not overdone: the risk is only to rises to market prices, which would reduce the level of acceptable unit matching.

One compromise approach could be to maintain a minimum level of unit matching that is robust to a certain reasonable tolerance for market rises, and to otherwise adjust hedging strategies outside of the unit-linked funds.

This approach of dynamically hedging options and guarantees by adjusting hedges in response to market movements is a well-established one in certain markets, notably in US-style variable annuities. They have, when implemented robustly, a proven track record of performing well even in volatile markets (see, e.g., <http://uk.milliman.com/insight/Research/perspective/research/pdfs/Performance-of-insurance-company-hedging-programs-during-the-recent-capital-market-crisis/>, based on performance during the 2008-2009 global financial crisis). However, this does require a sophisticated infrastructure to monitor the sensitivity of the value of options and guarantees and to adjust hedges, or unit matching, accordingly in response to market movements.

We are also aware of at least one case where unit matching has been implemented successfully by an EU insurer to hedge the costs of guarantees, within an existing dynamic hedging framework.

In conclusion:

- Unit matching approaches can be extended to hedge the cost of options and guarantees.
- This is conceptually different from unit matching of future charges, as instead the unit matching reflects the sensitivity of the cost of guarantees to unit prices. However, many of the same considerations apply.
- This requires a more dynamic approach, particularly in response to market movements, than is typically applied for unit matching programs. For insurers that already have dynamic hedging programs in place, using unit matching within them may be a natural extension.
- A core level of unit matching for options and guarantees, robust to a reasonable tolerance of market price increases, could also be applied on a more static basis.
- Unit matching can be a particularly useful addition to a hedging program for guarantees where other suitable hedging instruments are not readily available.

7. Unit matching across Europe

INTRODUCTION

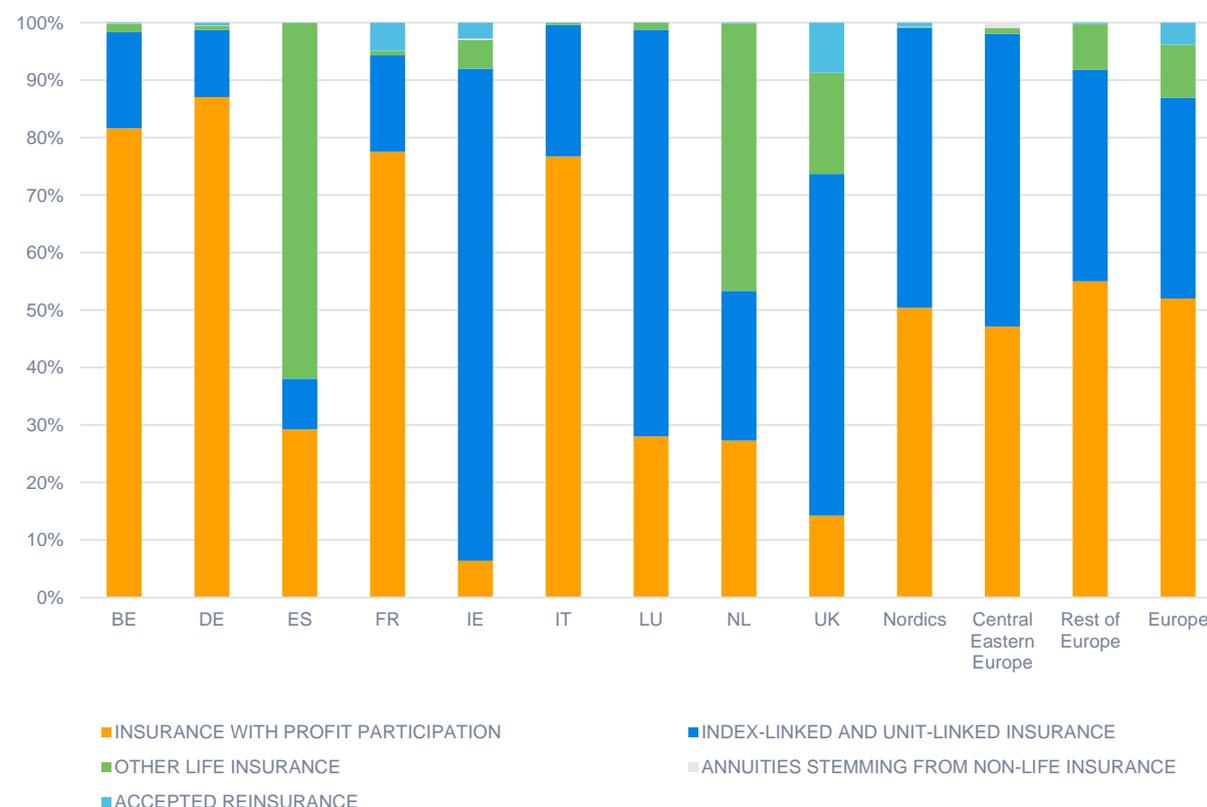
Although unit matching is a well-established investment strategy for unit-linked providers in the UK that can yield significant benefits, it presents varying opportunities, barriers and regulatory considerations for insurers in other European markets. In addition to our work assisting UK clients with their unit matching implementations, we have recently undertaken research to investigate and compare these differences further, the key findings of which are set out below.

EUROPEAN MARKET BACKGROUND

Unit-linked funds account for approximately £1 trillion of assets across the UK and unit-linked business makes up the largest proportion of the UK life insurance market in terms of volumes of technical provisions and gross written premiums. According to the SFCRs for a sample of 83 UK life insurers, in 2018, 59% of technical provisions⁷ and 60% of gross written premiums related to unit-linked business. The mix of life insurance business varies across Europe; however. Although the market in some countries (including Ireland, Luxembourg and of course the UK) is predominantly in respect of unit-linked business, many markets (including Belgium, France, Germany and Italy) are dominated by with-profits or participating business and other markets (notably Spain and the Netherlands) by other life insurance business such as non-profit annuities and traditional protection business. Based on the 2018 SFCRs of over 650 firms from 31 countries and one territory, this results in lower European averages for unit-linked business of 35% of technical provisions and 43% of gross written premiums.⁸

The chart in Figure 3 shows the split of technical provisions by line of business held by life insurers across European countries as at year-end 2018.

FIGURE 3: SPLIT OF TECHNICAL PROVISIONS BY LINE OF BUSINESS ACROSS EUROPE



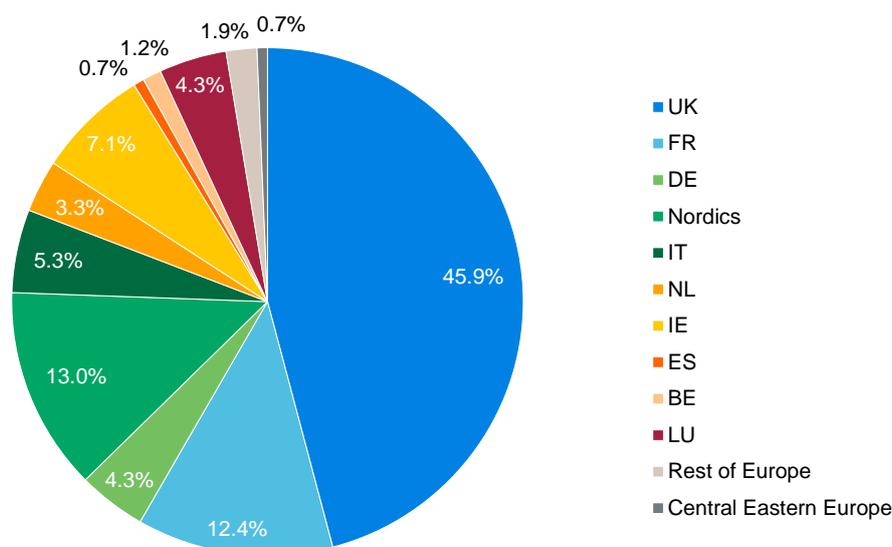
⁷ Technical provisions in respect of "Health Similar to Life Techniques" business have been excluded as these lines of business are very small on average across the sample of insurers considered.

⁸ For further background to these statistics please see our 2019 publication, [Analysis of life insurers' Solvency and Financial Condition Reports Year-end 2018 – European and UK life insurers](#).

Unlike in the UK where a number of life insurers, particularly life insurance subsidiaries of asset managers, write predominantly unit-linked business, in some European markets unit-linked business represents only a limited amount of life insurers' business. For example, unit-linked business is widely dispersed across the Belgian and Spanish markets, representing no more than 50% of technical provisions for any firm in the sample considered, and thus insurers in these countries are generally happy to allow the volatility of the unit-linked business to flow through own funds. However, in other markets such as Ireland, Luxembourg and Central and Eastern Europe,⁹ unit-linked business has been growing significantly in recent years and is becoming an increasingly important component of in-force business.

A breakdown of total unit-linked technical provisions for the European market by country as at year-end 2018 is provided in Figure 4.

FIGURE 4: SPLIT OF UNIT-LINKED TECHNICAL PROVISIONS BY COUNTRY



In light of these results, the popularity and success of unit matching implementations in the UK is unsurprising. The Nordics,¹⁰ Ireland and Luxembourg also seem to present good opportunity. France, Germany, Italy and the Netherlands have significant volumes of unit-linked technical provisions. However, as illustrated in Figure 3, they are relatively low when compared to total life insurance technical provisions in these countries and so, aside from a small number of specialist writers, unit-linked business is not a dominant component of firms' balance sheets or risk profiles.

OPPORTUNITIES AND BENEFITS

Key potential opportunities and benefits associated with unit matching in the UK are set out earlier in this report and include access to significant additional liquidity, reduced capital requirements, own funds optimisation and lapse risk management. The same holds true in some other European markets, although the relative importance of these things can vary. For example:

- Additional liquidity is an attractive benefit to a number of Irish insurers. The Irish industry has effectively two markets, a domestic market comprising insurers selling in Ireland and a cross-border market comprising Irish insurers selling overseas, and unit-linked business is a material component of both of these markets. For Irish insurers selling unit-linked business in Italy (the largest single territory in the cross-border market), additional liquidity is particularly attractive as a significant portion of own funds is future profits and Italian tax prepayment assets, both of which boost solvency cover but are not readily distributable. Some other Irish insurers may find attraction in unit matching as a risk mitigation or capital management tool. For example, we are aware of one firm that uses unit matching as a partial hedge for a unit-linked guarantee. In this case, the increase in the cost of the guarantee that arises when markets fall is offset by the gains arising from unit matching.

⁹ Comprising Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.

¹⁰ Comprising Denmark, Finland, Iceland, Norway and Sweden.

- Liquidity is generally not a concern in the Dutch life insurance market; however, an increased use of derivatives for hedging purposes could generate higher collateral requirements following market movements, notably interest rate rises in the context of short interest rate swap positions held against large and long-term pension liabilities. Reduced capital requirements and own funds stability could be of interest, particularly in terms of equity movements (interest rate falls increase the present value of future profits and so are a natural hedge for the short position that Dutch insurers usually hold). Although not typically front of mind, mitigation to an increase in surrenders following a fall in unit prices could also prove attractive.
- In Italy, the potential for reduced capital requirements tends to be limited in the context of overall solvency due to the relatively low materiality of unit-linked business. Historical volumes have been lower and lapse rates higher than participating business and although insurers have made efforts to increase unit-linked business volumes this will be harder to do now in light of market falls arising from the ongoing COVID-19 pandemic. Lapse risk management could be a stronger incentive, however. High surrenders accompanied the global financial crisis, a pattern that could be repeated in 2020 and beyond, and unit matching would provide Italian insurers with protection against the associated "double hit" on solvency.
- Several Polish insurers have quite high solvency ratios due to a soft regulatory limit on distributable profits, which means that additional liquidity and reduced capital requirements will not necessarily be of interest unless more distributable profits are generated. The fact that most unit-linked business is regular premium is also likely to mean that exposure to unit price movements is relatively less important than in a mainly single premium market.

INTEREST BY FIRMS

We are aware of (and have worked with) quite a number of UK insurers that have already implemented or are in the process of implementing unit matching. This group encompasses most of the major UK unit-linked insurers so it is now routinely the case that firms hold fewer unit-linked assets than the total surrender value of unit-linked policies.

In Ireland, we are aware of one insurer that has already implemented unit matching for hedging purposes and of another insurer (that Milliman consultants in Dublin are working with) at an advanced stage of its unit matching implementation, the primary objective of which is access to additional liquidity. Further, we believe that at least two other insurers (Irish entities within UK groups where the UK parent has implemented unit matching) have assessed a potential implementation; however, we are not aware of any plans to proceed at this point. It is worth noting that, despite there being precedent for unit matching, some in the industry still view the strategy as too risky or in some way "wrong."

Our research indicates that there is significantly less interest in unit matching in other European markets. On one hand, the concept is unfamiliar or unknown in some markets such as:

- Belgium, where unit-linked business is widely dispersed and so typically represents a limited amount of any individual insurer's overall business.
- Luxembourg, where there are very large blocks of unit-linked business but the insurers operate more in line with asset managers (as we observed for some UK firms in Section 2) and therefore shareholder-focused risk management and optimisation solutions tend to be less of a priority.

On the other hand, insurers might be familiar with the strategy but have decided against pursuing it for various reasons—we know that a number of large European insurance groups have successfully implemented unit matching in their UK entities but have not rolled it out to other European entities due to resistance from local management.

LEGAL AND REGULATORY CONSIDERATIONS

Under UK company law, unit-linked policyholders do not benefit from a first call over the unit-linked assets that have been notionally attributed to their policies and all policyholders share proportionately in any failure of an insurer. Hence, provided the capital policy of the firm is unchanged by unit matching, there should be no impact on the security of policyholder benefits.

Unit-linked business is an area of focus for the UK regulators as demonstrated by their ongoing supervisory activities, for example the FCA's unit-linked funds' governance review¹¹ and permitted links rules changes.¹² Despite this focus, however, formal regulatory approval is not required to implement unit matching and, subject to firms having appropriate governance and risk management processes in place to adequately implement and manage a unit matching strategy, the regulators have been satisfied with firms adopting this approach. We are aware of different firms adopting quite different unit matching strategies, including different approaches to determining the regulatory scope for unit matching and calibrating unit matching buffers. From our experience, these variances have not generated additional regulatory scrutiny or pushback and so there seems to be scope for interpretation, judgement and simplification where this can be justified.

- In Ireland, we do not believe there are any legal or regulatory barriers to implementing unit matching beyond the Solvency II rules discussed earlier in this report. In some instances, the extent to which local rules in overseas markets apply to Irish insurers selling into those markets may not be fully clear and so there may be some additional legal constraints for the cross-border Irish market.
- In other European markets, the situation is less straightforward:
 - In the Netherlands, for example, there are no legal constraints. Similar to the UK, the unit-linked funds are part of the total asset base of the insurer and not legally ring-fenced to policyholder accounts. However, the compliance functions of Dutch insurers have historically pushed back against this type of strategy. The situation where an insurer promotes buying unit-linked investments to a policyholder, and at the same time shorts the position, is not appreciated and deemed to be a risk in terms of mis-selling, which is unsurprising in light of historical mis-selling of Dutch unit-linked insurance business and the associated loss of confidence in this type of product.
 - Italian actuaries' first reaction to unit matching tends to be that it is not in line with the spirit of the law. The Code of Private Insurance¹³ states that:

*"Where the benefits provided by a contract are directly linked to the value of units in an UCITS or to the value of assets contained in an internal fund held by the insurance undertaking, the technical provisions in respect of those contracts shall be represented as closely as possible by the units in the UCITS or by the units in the internal fund, if it is divided into units, or by the assets contained in such fund."*¹⁴

The reference to "technical provisions in respect of those contracts" appears to support not having to cover the full face value of policyholders' unit-linked funds with unit-linked assets and hence the concept of unit matching. However, the rules relating to the winding up of an insurer¹⁵ make the situation less clear, as they appear to suggest that, in the case of a winding up, the assets associated with particular blocks of insurance contracts should be used to settle the liabilities in respect of those contracts. This could be used to argue that not holding the full face value of unit-linked funds (or at least the surrender value) would prejudice policyholders' security.

- In Central Eastern Europe, there have been several waves of regulatory interventions by the Polish Office of Competition and Consumer Protection relating to the level of the surrender charges on unit-linked business. This controversy, alongside the Polish Financial Supervision Authority (KNF) being viewed as resistant to actions that accelerate dividend capacity and the KNF taking an active role in unit-linked fund client protection and prevention of holding assets in illiquid funds, makes Polish insurers reluctant to implement any strategies that could be perceived as aggressive for unit-linked business. From a legal perspective, however, as far as we are aware there is nothing that would put unit-linked policyholders in a privileged position relative to other policyholders in case of, for example, insurer bankruptcy. As with other countries where there is hesitation to implement unit matching but no obvious legal barrier, perhaps the hesitation could be overcome with communication efforts.

¹¹ FCA (24 September 2019). Unit-linked Funds' Governance Review (follow-up to PS18/8): Findings and Next Steps. Retrieved 25 June 2020 from <https://www.fca.org.uk/publications/multi-firm-reviews/unit-linked-funds-governance-review-follow-ps18-8-findings-next-steps>.

¹² FCA (4 March 2020). PS20/4: Amendment of COBS 21.3 Permitted Link Rules. Retrieved 25 June 2020 from <https://www.fca.org.uk/publications/policy-statements/ps20-4-amendment-cobs-21-3-permitted-link-rules>.

¹³ IVASS (10 June 2020). Code of Private Insurance. Retrieved 25 June 2020 from https://www.ivass.it/normativa/nazionale/primaria/CAP_EN.pdf?language_id=3.

¹⁴ Article 41(1).

¹⁵ In particular Article 241(3) and Article 258(1),(3).

FIRM, FUND, AND PRODUCT FEATURES AND OTHER POTENTIAL BARRIERS TO UNIT MATCHING

In Section 3, we set out examples of firm, fund and product features for which unit matching is likely to prove most beneficial and attractive based on our experience in the UK, along with some specific features that could be perceived as barriers to successful implementation.

Other things equal, higher AMCs and unit margins increase the scope for unit matching. Unit-linked funds and products in a number of European markets have quite high unit margins, for example in Italy and Poland. However, European investors and regulators are increasingly looking for value for money from the asset management industry, as evidenced by the Markets in Financial Instruments Directive II (MiFID II) and packaged retail and insurance-based investment products (PRIIPs) legislation in Europe and the FCA Asset Management Market Study¹⁶ and unit-linked funds' governance review¹⁷ in the UK. It therefore seems likely that there will be continued downward pressure on margins and broad alignment across the European market in this regard.

In the UK, for the purposes of calculating the Solvency II BEL, a number of life insurance subsidiaries of asset managers only project cash flows for the notification period prior to the right to terminate their unit-linked contracts, rather than until the expected expiry of those contracts. This "short projection period" approach has the effect of reducing the present value of future profits from unit-linked business and hence the scope for unit matching. We are not aware of this being an issue that affects insurers in other European markets. However, another potential barrier that we see in the UK is high or volatile surrender rates (for example, for group business and/or new unit-linked funds and products), which has the effect of reducing the benefits and increasing the risks and costs associated with unit matching, and this is common to a number of countries. In Italy, for example, lapse experience can be quite unstable and switches are also a phenomenon.

A number of further potential barriers that could materially affect the relative attractiveness and feasibility of unit matching are set out below.

- There are a number of insurers in the Irish cross-border market writing portfolio bond business, which may not lend itself to unit matching. However, apart from that, there are many Irish insurers with suitable, sizable books of retail "vanilla" unit-linked business.
- Although we have not been able to verify this with certainty, it is possible that standard policy terms and conditions in certain markets explicitly state that the insurer will purchase and hold the full value of unit-linked assets nominally attributed to the policy. Thus, unit matching might only be applicable to future new business by way of an update to terms and conditions.
- Issues relating to mixed life and pensions funds and/or property or illiquid funds may apply to a greater or lesser extent in different markets. For example, in Poland, life and pensions business is clearly divided in separate firms and unit matching is unlikely to be feasible for pensions business, which is generally regulated outside of the life insurance industry. Further, Polish business does not present material issues relating to property funds. However, illiquid and closed-end funds could be a problem in other markets, for example in the Netherlands.
- There may be accounting restrictions at play. In Belgium and Luxembourg, for example, the need to report mathematical reserves under Belgian GAAP and Luxembourgian GAAP, respectively, creates an incentive for insurers to hold unit-linked assets to cover the full face value of unit-linked funds.

¹⁶ FCA (18 November 2015). Asset Management Market Study. Retrieved 25 June 2020 from <https://www.fca.org.uk/publications/market-studies/asset-management-market-study>.

¹⁷ FCA, Unit-linked Funds' Governance Review (follow-up to PS18/8), op cit.

CONCLUSION

It is clear from our analysis that there are a number of significant unit-linked insurance markets for which, on first glance, unit matching looks like an attractive option. In particular, the Nordics and Luxembourg have relatively large volumes of unit-linked business both when compared to other life insurance business in these markets and to unit-linked business volumes in other European markets. Furthermore, a number of Irish unit-linked insurance providers have already implemented (or are considering implementing) a unit matching strategy and there is plenty of scope for others to follow suit.

That being said, a number of material issues and challenges currently stand in the way of widespread European implementation of the strategy. Most notably, unit matching is commonly viewed as too risky or aggressive, and contrary to policyholder expectations. We acknowledge the difficulty that firms will have in building a business case for unit matching in such circumstances. However, to the best of our knowledge, subject to there being no explicit statements in policy terms and conditions that prohibit unit matching, there is typically no overriding legal barrier to the strategy. Rather, the barrier is a conceptual one.

As we have talked to in this report, UK experience has shown that unit matching, when implemented correctly, can be beneficial to the shareholder without any disadvantage to policyholders and can meet the expectations of regulators. Firms that have implemented the strategy have established carefully designed frameworks to achieve the associated financial and risk management benefits and, at the same time, to ensure and evidence that there are no material adverse consequences from a policyholder perspective. If this latter element were not fully satisfied then a firm's board and governance committees would not approve the strategy nor would the regulators.

For quite some time, there has been an established precedent for unit matching in the UK and, even before that, a similar concept (actuarial funding) was widely implemented under the previous UK insurance regulatory regime. Therefore, the idea of holding less than the full face value of policyholders' unit-linked funds is a familiar one. By contrast, there may be a further "cultural" bridge to cross in other European markets where unit matching represents a completely new way of thinking about and managing unit-linked business. It would also be hard to be the first to diverge from the norm without the benefits of lessons learned from those who have gone before and with likely heightened scrutiny from internal governance bodies, regulators and other key stakeholders.

Despite the associated challenges, we believe that unit matching could be deployed more widely across Europe, as part of the overall capital management tool kit for unit-linked business, to yield significant benefits for life insurers, subject to firms carefully working through the various issues and considerations set out in this report and discussing them internally, with regulators and other key stakeholders.

8. How Milliman can help

Milliman's experience makes us well placed to guide firms through the technical and practical aspects of embedding and implementing a unit matching strategy. Our services include:

- Carrying out an initial feasibility study.
- Developing practical solutions that recognise systems constraints.
- Supporting engagement of key stakeholders, board committees and regulators. Assisting with implementing the strategy, in terms of the actuarial, risk management and governance, treating customers fairly and operational aspects.
- Helping firms to establish and manage an optimal level of unit matching alongside alternative and/or preexisting capital management solutions.

More widely, we have extensive experience working with both insurance companies with unit-linked business and asset and investment managers. Our work on unit-linked business includes capital management, cash flow modelling, balance sheet forecasting, stress and scenario testing, ORSA analysis and the development of risk management and governance frameworks, as well as fulfilling regulatory roles and transaction work.



Milliman is among the world's largest providers of actuarial and related products and services. The firm has consulting practices in life insurance and financial services, property & casualty insurance, healthcare, and employee benefits. Founded in 1947, Milliman is an independent firm with offices in major cities around the globe.

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