GN44: Mathematical Reserves and Resilience Capital Requirement

Classification
Practice Standard

MEMBERS ARE REMINDED THAT THEY MUST ALWAYS COMPLY WITH THE PROFESSIONAL CONDUCT STANDARDS (PCS) AND THAT GUIDANCE NOTES IMPOSE ADDITIONAL REQUIREMENTS UNDER SPECIFIC CIRCUMSTANCES

Purpose
The FSA Integrated Prudential Sourcebook (PRU) requires insurance companies and Directive friendly societies with *long-term insurance liabilities* to establish *mathematical reserves* and a *resilience capital requirement* in respect of these liabilities. It also sets out detailed rules and guidance to follow in calculating these items, including in particular a requirement (PRU 7.3.10 (7) R) to use methods and assumptions which are in accordance with generally accepted actuarial practice, and (PRU 7.2.16 (1) R) more generally to establish adequate *technical provisions* with due regard to generally accepted actuarial practice. PRU 7.2.17G establishes that guidance notes such as this are important sources of evidence as to generally accepted actuarial practice. This note therefore provides additional guidance to insurers and Directive friendly societies on how to meet these requirements. Guidance for non-Directive friendly societies is contained in GN8.

Definitions
Defined terms appear in italics when used in the standard.

Reference	Definition
actuarial function holder	A Fellow of the Faculty of Actuaries or of the Institute of Actuaries appointed by (or by the FSA for) a *firm* in accordance with SUP4.3.1R or 4.3.3R of the FSA Handbook to perform the role specified under SUP4.3.1R(1)(a)
firm	The insurance company or Directive Friendly Society in respect of which *mathematical reserves* are being established

The following terms have the meanings given to them as in the FSA Handbook of Rules and Guidance:

accumulating with-profits policy
admissible asset
annual bonus
final bonus
long-term insurance fund
long-term insurance liabilities
mathematical reserve
Principles and Practices of Financial Management ("PPFM")

realistic basis life firm
realistic excess capital
regulatory basis only life firm
resilience capital requirement
technical provision
with-profits insurance capital component

Legislation or Authority
The Financial Services and Markets Act 2000
The FSA Handbook of Rules and Guidance: Integrated Prudential sourcebook ("PRU"), Interim Prudential sourcebook for Insurers ("IPRU(INS)")

Application
The establishment of *technical provisions* as required by PRU 7.2.16R in accordance with the rules and guidance in PRU 7.3 relating to *mathematical reserves*, and the calculation of the *resilience capital requirement* as required by PRU 2.1.22R in accordance with the rules and guidance in PRU 4.2.

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from which time it ceased to operate (and cannot, with effect from that time, be relied upon) as guidance issued by the Profession. Members needing to comply with professional standards on matters covered by this Guidance Note should in future consult the standards published by the Board for Actuarial Standards.

1 General

1.1 This Guidance Note is drafted in terms which are not addressed to actuaries specifically. Nevertheless, actuaries performing work covered by this Guidance Note are required to apply it according to its classification. Thus, where a *firm* requires an actuary to produce work conflicting with this Guidance Note, the actuary may do so provided that the work clearly and unambiguously states that the actuary has done so under instructions and that the work does not conform to this Guidance Note. The adoption of such technical provisions or resilience capital requirement will create a situation where the *actuarial function holder* will be required to report the matter to the FSA (see GN37).

1.2 This GN provides additional guidance in relation to the calculation of *mathematical reserves* in accordance with the rules and guidance included in

PRU 7.3 and the calculation of a *resilience capital requirement* in accordance with PRU 4.2.10R. The guidance is supplementary to PRU and to any individual guidance given by FSA. The quotations from and references to the PRU rules and guidance should not be used as a substitute for reference to the full PRU text.

1.3 PRU 7.3 is relevant to the valuations of *long-term insurance liabilities* for the purposes of PRU 7.2.16R. Such a valuation is, inter alia, relevant for determining:

(a) whether the certificate in respect of long-term insurance business required by IPRU(INS) 9.34 can be given;

(b) the extent to which sufficient assets are held in accordance with PRU 7.2.20R to 7.2.29G as appropriate to the *firm*; and

(c) whether a dividend may be declared by the *firm*, having regard to IPRU(INS) 3.2 (6).

1.4 In several areas, this GN provides guidance which varies according to the materiality of the issue in question. For these purposes materiality should be assessed relative to the impact of the issue on both the surplus assets in the *long-term insurance fund* and the amount of the *long-term insurance liabilities*.

1.5 All reasonable steps must be taken to ensure that the data used to calculate all elements of the *mathematical reserves* and the *resilience capital requirement* are accurate. If there are any doubts about the accuracy of the data, an additional *mathematical reserve* must be made for the risk that the actual value of the liabilities will be greater, or the value of assets less, than that derived from the available data. If the potential inaccuracy is material, and the directors' certificate required under IPRU(INS) 9.34 does not make reference to this, this will create a whistleblowing responsibility under GN37.

1.6 PRU 7.3.20R requires that the *firm* retain appropriate records of the valuation methods and assumptions, and changes in approach.

1.7 If any aspect of this standard has not been complied with, this fact, the reasons for it and the alternative adopted should be disclosed in the *actuarial function holder*'s report required under IPRU(INS) 9.31(b).

2 Basic valuation method

2.1 PRU 7.3.7R and PRU 7.3.10R are paramount. PRU 7.3.7R requires a prospective valuation of future cash flows on prudent assumptions, allowing a retrospective approach only if a prospective approach is impossible or if it can be demonstrated that the retrospective approach is at least as prudent.

2.2 PRU 7.3.9R makes clear that, except in PRU 7.3.71R(1), which covers cash payments under *accumulating with-profits policies*, no implicit or explicit *mathematical reserve* is needed for *final bonus*. Furthermore, for *realistic basis life firms*, no implicit or explicit *mathematical reserve* is needed for future

annual bonus. For these *firms* the ability to meet policyholders' reasonable expectations is demonstrated through the calculation of the *realistic excess capital* and the *with-profits insurance capital component*.

2.3 PRU 7.3.10R(5) and (6) respectively require the *firm* to use methods and prudent assumptions which recognise emerging surplus in an appropriate way and which take into account its regulatory duty to treat its customers fairly. When carrying out the valuation of with-profits business, *regulatory basis only life firms* must interpret this as requiring the valuation basis to be sufficiently strong to enable a level of future *annual bonus* to be declared which would be consistent with the reasonable expectations of policyholders in the event that experience were only to follow the valuation basis. As in paragraph 2.2 above, *realistic basis life firms* do not need to make any allowance for future *annual bonus*.

2.4 PRU 7.3.10R(7) requires the use of methods and prudent assumptions which are in accordance with generally accepted actuarial practice. A valuation method which is not in general use in the actuarial profession (whether to value a normal type of contract or in other circumstances) is not precluded, but would need to be justified by reference to actuarial principles.

2.5 Account must be taken of any relationship which the *firm* has with another company that is relevant for the purposes of the valuation. For example, where there are service agreements with other companies (whether or not within the same group structure) consideration must be given as to whether any additional provision is necessary for the contingency that such agreements might cease. This would be particularly relevant where a subsidised or beneficial agreement exists.

2.6 PRU 7.3.24R and 7.3.25G make clear that the minimum *mathematical reserve* for a policy is zero. Aggregate methods, when used, must therefore not implicitly permit the netting off of negative reserves in respect of some policies.

3 Margins for adverse deviations

3.1 PRU 7.3.10R(4) and PRU 7.3.13R require inclusion of appropriate margins for adverse deviations of the relevant factors which must be sufficiently prudent to ensure that there is no significant foreseeable risk that liabilities to policyholders in respect of long-term insurance contracts will not be met as they fall due.

3.2 For a diversified portfolio of assets, the volatility of which is not expected to deviate materially from the market, it is appropriate to assume that the requirements in PRU 4.2 together with the *resilience capital requirement* satisfy the requirement for margins for adverse deviations in respect of the market risks explicitly covered by the requirements in paragraph 3.1.

3.3 PRU 7.3.16G and 7.3.17G provide guidance on ways of satisfying PRU 7.3.13R. They state that a *firm* should consider whether its own or a market risk premium may be an appropriate measure and if that is not practicable, an external proxy, such as a standard mortality table suitably adjusted, should be used. Before adopting such an approach, consideration must be given as to whether the margin

it would imply would satisfy the requirements of PRU 7.3.13R either in general or in the particular circumstances of the *firm*.

3.4 PRU 7.3.17G expects the use of stochastic modelling where there is a considerable range of possible outcomes. Section 9 below and GN47 give further guidance on this in the context of financial options and guarantees. PRU 7.3.17G says that "In time, for example longevity risk, where this constitutes a significant risk for the *firm*, may fall into this category". However, in many of those situations stochastic modelling may add little to the understanding of the risk, and may lead to the assumptions being less clear because they are hidden within the model parameters. When considering the need for stochastic modelling a *firm* must take into account whether it would materially alter the reserves calculated deterministically, and if the *firm* concludes that this is unlikely, it is acceptable to use the deterministic method with an appropriate explanation.

3.5 Approximations to stochastic modelling can be used if it can be demonstrated that the *mathematical reserve* is prudent. The method used to demonstrate prudence does not itself need to be a full stochastic quantification, the requirement being solely that it should demonstrate prudence.

4 Avoidance of future valuation strain

4.1 In this section 4, "linked business" includes "accumulating with-profits business".

4.2 Although PRU 7.3.26R is of general application, the principle of the avoidance of future valuation strain is likely to be of particular importance in the assessment of non-unit reserves for linked business (or, where reserves for accumulating with-profits business are not split into unit and non-unit components, the aggregate reserve). Such reserves may be determined on a deterministic basis. The non-unit reserve for a policy may be negative, but the total reserve for a policy must be non-negative.

4.3 PRU 7.3.27G requires that allowance is made for, amongst other things, the possibility of regular premium policies being made paid-up and of partial surrenders. Partial surrenders must be taken to encompass regular withdrawals as well as periodic partial encashments. Prudent future allowance for surrenders and policies becoming paid up must be made, based where possible on the *firm*'s own experience. In accordance with PRU 7.3.29R(1), the reserve (and future cashflow) must include cover for guaranteed surrender or paid-up benefits. This must be tested at a policy-by-policy level. Further guidance on the selection of persistency assumptions is given in section 10.

4.4 In respect of linked business, the reserves must not be less than those which would be obtained by calculations using a consistent relationship between the assumed underlying gross unit growth rate (i.e. the rate before any allowance for taxation and management charges), the assumed rate of inflation of maintenance expenses and the discount rate as prescribed by PRU 7.3.33R. The computation actually used must also produce an overall margin for adverse deviation in compliance with PRU 7.3.10R(4) and PRU 7.3.13R (see paragraph 3.1 above).

4.5 Where the *firm* has discretion to increase charges for linked business, account may be taken of this when calculating the reserves, but only to the extent that the assumed future increases in charges would be consistent with the fair treatment of customers and contractual conditions in the context of the assumptions made for the valuation. In making the calculation allowance must be made for any delay before increases could be implemented, and for any administration costs associated with such increases.

5 Interest rates

5.1 PRU 7.3.33R requires that rates of interest used for calculating present values of future cash flows be determined in accordance with PRU 4.2.28R to PRU 4.2.47R.

5.2 PRU 4.2.28R requires that the rate of interest to be used to value a liability must not exceed 97.5% of the risk-adjusted yield that is expected to be achieved on the assets allocated to cover that liability, the reinvestment of sums expected to be received from those assets, and the investment of future premium receipts. PRU 4.2.30R to PRU 4.2.48G define the risk adjustment.

5.3 Under generally accepted actuarial practice, an asset may be assumed to be disposed of only when required to meet the liability, or where the characteristics of the liability change significantly at a point in time. The change of a policy from with-profits to non-profit is such a change.

5.4 PRU 4.2.29R requires that the rate of interest to be used to value a liability must allow appropriately for the rate of tax that applies to the investment return earned on the policyholder assets, and that the resulting implied total tax liability of the *firm* is not less than the total expected tax liability under the valuation assumptions. The actual total expected tax liability will reflect the allocation of assets to liabilities within the firm's tax calculation, which may differ from the allocation of assets to liabilities for the purpose of PRU 4.2.28R. If allowance is so made for the actual allocation used in the *firm*'s tax calculation, this must be on a sustainable basis over the term of the relevant contracts, assuming unchanged tax legislation. It would not be appropriate to offset an excess of the actual expected tax liability in one period against a subsequent shortfall without adjusting for the time value of the respective amounts.

5.5 Distinct subsets of assets can be allocated to different classes of policy. Although there are no specific requirements regarding the type of assets which may be allocated to particular classes of business, some allocations would not be prudent, for example allocation of overseas branch assets to cover liabilities to United Kingdom policyholders if rules in the territory concerned made such an allocation impractical to achieve. For the purpose of PRU 4.2.30R, where derivative contracts are held in connection with particular assets or liabilities in the *long-term insurance fund*, it is necessary to apportion such derivatives together with the corresponding assets or liabilities.

5.6 The risk-adjusted yield must be calculated separately for each asset held. PRU 4.2.35R then states that the risk-adjusted yield on a basket of assets is the arithmetic mean of the risk-adjusted yield on each asset weighted by that asset's market value. It is the risk-adjusted yield on future investments associated with a particular liability – not the yield on current investments – that is subject to the restrictions discussed in PRU 4.2.45R to PRU 4.2.48G.

5.7 PRU 4.2.36R states that the running yield on real estate is the ratio of the rental income arising over the previous 12 months to the market value of the real estate. The rental income used must be after deducting any ongoing costs of managing the real estate, such as the collection of rent and cost of repairs unless these are provided for in the expense reserves. Account must be taken of changes known to have occurred by the valuation date, as required by PRU 4.2.33R.

5.8 PRU 4.2.39R sets out the calculation of the internal rate of return. Where appropriate, it is necessary to allow for interest accrued up to the valuation date if this is not otherwise allowed for in the market value of the asset.

5.9 To recognise credit risk, PRU 4.2.41R requires an adjustment (where relevant) to the running yield on equities and real estate and to the internal rate of return on fixed interest stocks. When assessing this adjustment, it is appropriate to allow for market knowledge, degree of marketability and, for real estate, the covenant of the tenant. A yield on an asset in excess of the yield on government stock of a similar term is not necessarily due entirely to credit risk.

5.10 PRU4.2.45R to 4.2.47R constrain the risk-adjusted yield assumed for investments or reinvestments. These rules apply to assumptions as to yields, and therefore do not extend to situations where the yield is known.

a) For *realistic basis life firms*, the risk-adjusted yield assumed for sterling investments or reinvestments must not exceed a rate derived from the forward gilts yield. Where the valuation approach adopted does not allow for forward yields to be used directly, it must be demonstrated that any approximation is reasonably expected to be no less prudent. One approach for demonstrating this is to test the resulting discount derived for relevant durations with the price of comparable gilt strips.

b) For *regulatory basis only life firms*, there is an upper limit for the risk-adjusted yield assumed for sterling investments or reinvestments.

c) A correspondingly prudent approach must be followed where liabilities are denominated in currencies other than sterling. For some currencies, the sterling interest parameters included in PRU 4.2.45R will not be appropriate, and these rates must be reduced where recent yields on risk free securities for the currency concerned are materially lower than those for sterling. Any increase to the interest parameters for currencies other than sterling must be justified, and must in particular include consideration of the historical yields on risk free securities (if any) for the currency concerned.

6 Future premiums

6.1 For *regulatory basis only life firms*, PRU 7.3.38R requires the use of a net premium method for categories of with-profits insurance other than *accumulating with-profits policies* written on a recurring single premium basis. The net premium may be adjusted for deferred acquisition costs in accordance with PRU 7.3.43R.

6.2 For *realistic basis life firms*, PRU 7.3.46R permits the use of future premiums up to the full gross premium payable by the policyholder (see PRU 7.3.47G), other than for *accumulating with-profits policies* written on a recurring single premium basis. This does not preclude the use of a net premium approach, with the premium limited to the gross premium payable by the policyholder.

6.3 For all *firms*, PRU 7.3.48R prevents any credit being taken in respect of future premiums payable on *accumulating with-profits policies* written on a recurring single premium basis, and allows for any liability arising from the payment of a future premium to be ignored except to the extent that the value of that liability upon payment would exceed the amount of that premium. Where this latter exception applies and if the liability upon payment is included in full within the reserving calculations, it is appropriate to offset this by the value of the corresponding future premium, with the result of recognising only the excess of liabilities over premiums.

7 Expenses

7.1 PRU 7.3.50R(2)(c) requires implicit or explicit provision to be made for the future increases considered likely in expenses for existing business, based on prudent assumptions as to the future rates of increase in prices and earnings. In considering such provision, it would be reasonable to take into account a prudent allowance for margins arising from, and restrictions on, interest rate assumptions, e.g. increases in income from existing holdings of index-linked stocks, equities and property or the restriction on income created by the limitations of PRU 4.2.45R and PRU4.2.46R. The limited application of PRU 7.3.50R (2)(c) to the effects of inflation does not override the requirement in PRU 7.3.50 (1) and under generally accepted actuarial practice to allow for future increases in expenses considered likely from other causes.

7.2 Where a net premium method is used it is permissible to take credit for the difference between the gross premium and the valuation net premium in assessing the provision to be made for meeting the expenses likely to be incurred in future in fulfilling the existing contracts, but only to the extent allowed by PRU 7.3.50R(3) and PRU 7.3.51G to 7.3.52G.

7.3 Consideration must be given to the impact of selective withdrawals on the allowance for future expenses, particularly where the allowance is not assessed on a per policy basis. For example if allowance for expenses is expressed as a percentage of premiums, the possibility of higher withdrawals among high premium policies should be taken into account. Particular attention should be paid to this aspect when calculating non-unit reserves for linked business.

7.4 Explicit allowance for future expenses is required for all contracts under which no future premiums are receivable, unless these expenses are provided by disclosed margins in the valuation rate of interest.

7.5 Proper provision must be made for claims handling expenses, directly or indirectly. This is particularly relevant to classes of business such as permanent health insurance where these expenses are likely to be significant.

7.6 Whether or not the valuation is carried out on the assumption that the *firm* will continue to transact new business, PRU 7.3.50R(2)(d) requires an assessment of the provision for future expenses against the total (net of tax) cost that would be incurred in fulfilling contracts if the *firm* were to cease to transact new business twelve months after the actuarial valuation date. The provision must be sufficient, on the valuation assumptions, to meet these expenses in these circumstances and must take into account the fact that the transition to a closed fund is likely to be costly and that it may take more than twelve months from such closure before the lower level of expense appropriate to a closed fund is achieved, together with any impact on the future tax position of the fund. In assessing the provision required to meet additional expenses that are likely to occur in the event of closure to new business, account may be taken on a prudent basis of outstanding margins on the existing business projected to emerge on the valuation assumptions over the period that the additional expenses are incurred.

8 Mortality and morbidity

8.1 Allowance must be made for adverse trends in experience within the *firm* or the industry which could increase the insurer's liabilities, including the potential worsening of such trends. The overall margin for adverse deviation in mortality or morbidity experience must take account of the degree of uncertainty regarding the causes of observed changes in experience, and the consequent range and likelihood of possible future changes. In the context of annuitant longevity, it will normally be appropriate to consider a birth-year cohort approach where the liability is material.

8.2 For assurance and sickness business, PRU 7.3.60G(5)(c) requires that allowance is made for the incidence of mortality and morbidity arising from diseases whose impact may not yet be reflected fully in current mortality or morbidity experience. However, if past and expected future trends in mortality and morbidity experience from other causes are favourable, allowances under this heading may be offset against prudently expected improvements from those other causes with additional reserves only established if the net effect is expected to be adverse.

8.3 PRU 7.3.60G(5)(a) and (5)(b) respectively prevent taking allowance for net future favourable improvements in mortality or the detection of morbidity. PRU 7.3.59R requires that this guidance is applied to the assumptions used in the country or territory of residence for each person whose life or health is insured.

8.4 PRU 7.3.60G (5)(b) refers to the improved detection of morbidity, including in the context of critical illness policies. Consideration must also be given to increased incidence rates arising from the increased prevalence in surgical techniques covered by such policies (e.g. angioplasty). It is particularly important to allow adequate margins for adverse deviation in experience due to improved detection of morbidity where premium rates are guaranteed.

8.5 For permanent health insurance business the adequacy of the reserves should generally be assessed against a method which makes specific allowance for claim inception rates and the duration of sickness. Alternative techniques may be acceptable in some circumstances, for example for sickness contracts with very short deferred periods in respect of short duration claims. Where the Manchester Unity method is used it should be borne in mind that observed experience as measured by this method is highly sensitive to the maturity of the business. If the valuation basis is being set by reference to observed experience it will be appropriate to consider how this is likely to change as the business matures. For immature business and in some other circumstances significant margins over current experience may be appropriate. If the Manchester Unity method is used, consideration should be given as to whether additional reserves need to be established in respect of claims in payment.

9 Options

9.1 PRU 7.3.62R requires account to be taken of all options available to the policyholder under, or by virtue of, the contract and that provision must be made on prudent assumptions to cover any increase in liabilities caused by policyholders exercising options under their contracts.

9.2 The determination of the liability for any contract feature that places a minimum level on the benefits payable which otherwise vary in a non-discretionary manner (for example a maturity guarantee on a unit-linked policy) must also take into account the guidance set out in paragraphs 9.3 to 9.13.

9.3 Where an optional benefit may be a higher liability than the basic benefit under the valuation assumptions, then a prudent allowance should be made in the valuation for the proportion of policyholders likely to exercise the option (taking into account the proportion of time the optional benefit is expected to be of greater value) and the expected excess of value when exercised.

9.4 Even where an optional benefit of a higher liability is likely to be the more attractive alternative to the policyholder, there may be reasons why not all policyholders will exercise the option, for example tax treatment, or a preference for a cash sum alternative to an annuity. In such cases, it is appropriate to make allowance for a proportion failing to exercise the option. In making such an allowance, PRU 7.3.64G states that past experience may only be taken into account to the extent that it is deemed likely to remain relevant under the other valuation assumptions.

9.5 In particular, in the context of guaranteed annuity options, improving longevity and increasing awareness of the value of such options should be anticipated to

lead to an increase in take-up rates. Accordingly, PRU 7.3.66G requires a take-up rate of at least 95% to be assumed in respect of guaranteed annuity option dates 20 years or more ahead. The rate assumed in the interim should progress steadily from a prudent rate based on current experience to 95%.

9.6 The likelihood that options will be exercised, and liabilities increased as a result, may be linked to the interest rate prevailing from time to time. The assumption of a single fixed interest rate for the purposes of determining whether such liabilities are likely to arise may in some circumstances produce an unreasonably low or nil reserve, whereas the recognition of a potential range of interest rates may give rise to a significantly higher reserve. In such circumstances, PRU 7.3.67G requires the use of either stochastic models or market option pricing (but see paragraph 3.4 above with regard to longevity).

9.7 When stochastic models or market option pricing are used to calculate the reserve, the reserve must be reviewed for the purposes of calculating the *resilience capital requirement*. When calculating the liability using stochastic techniques, the level of prudence must not be reduced by the inclusion of a risk premium in any of the parameters. GN47 provides further guidance on recommended practice for stochastic modelling.

9.8 More approximate methods may be used if it can be demonstrated they are prudent and this would not materially alter the overall valuation result. The method used to demonstrate prudence does not itself need to be a full stochastic quantification, the requirement being solely that it should demonstrate prudence.

9.9 Where a contract permits periodic withdrawals, account must be taken of the effects of these, for example in the calculation of a non-unit reserve, if to do so would increase the reserves held. Allowance must be made for all contracts where withdrawals are currently taking place, and an allowance must be made for contracts where withdrawals may reasonably be expected to commence in future, taking into account recent experience of the rate of commencement of such withdrawals. In assessing the allowance to be made, the requirement under PRU 7.3.7R and PRU 7.3.13R to use prudent assumptions with appropriate margins for adverse deviations should be borne in mind.

9.10 An option to surrender a policy immediately in return for a non-guaranteed discontinuance (or surrender) value is included among the options to be considered under PRU 7.3.70R. This rule requires provision for options, including discontinuance values, to be at all times sufficient on the valuation assumptions to meet payments as they fall due, i.e. that there be no future valuation strain. In assessing the level of discontinuance value that might be payable in the future for a *regulatory basis only life firm*, it is necessary to allow for future rates of annual bonus consistent with the reasonable expectations of policyholders if experience were to follow the valuation basis. As discussed in paragraph 2.3 above and consistent with PRU 7.3.9R, *realistic basis life firms* do not need to allow for future annual bonus in any other aspect of the calculation of *mathematical reserves*.

9.11 PRU 7.3.71R refers to an amount which would reasonably be expected to be paid if the option were exercised, having regard to the representations of the *firm*. Where the *PPFM* and other representations of the *firm* allow for a lower amount to be paid in the event of, for example, a significant level of policy discontinuances, this reference may be taken to be to that lower amount.

9.12 PRU 7.3.71R(1)(b), which relates to *accumulating with-profits policies*, refers to an amount obtained by disregarding all discretionary adjustments. This means disregarding all such adjustments, both positive (such as *final bonus*) and negative (such as market value reduction factors), but does not mean that it is necessary to disregard automatic adjustments (such as surrender penalties) that are applied to discontinuance values in any financial conditions.

9.13 When considering reasonable expectations with regard to discontinuance values of policies other than *accumulating with-profits policies* for the purposes of PRU 7.3.71R(2), account must be taken of representations made by the *firm* to policyholders, including those in marketing literature and the *firm*'s *PPFM*. PRU 7.3.71R(2) allows, amongst other things, any amount of a discontinuance value which may be reasonably considered to represent an addition in respect of *final bonus* to be ignored.

10 Persistency

10.1 For *regulatory basis only life firms* and (in relation to business other than with-profits business) *realistic basis life firms*, PRU 7.3.74R requires that no allowance for voluntary discontinuance be made in the calculation of *mathematical reserves* if as a result the amount of *mathematical reserves* would be reduced. Where allowance for voluntary discontinuance needs to be made, it must be assumed that the guidance in paragraph 10.2 below also applies to *regulatory basis only life firms*.

10.2 For *realistic basis life firms*, PRU 7.3.76R requires that prudent assumptions are made about persistency in relation to with-profits business. It is necessary to assess whether a change in assumed persistency for a class of business on or around particular durations (e.g. when valuable options are available) increases or reduces the reserve. Prudence must be in the direction which increases the reserve, even if this means different directions for different classes or on particular occasions.

10.3 PRU 7.3.77G requires that the margin for adverse deviation allows for increased prudence well into the future. This must be interpreted as requiring reserves no less that those based on assumptions which gradually worsen over time from a prudent rate based on current experience. An alternative approach to setting the assumptions – for example, an immediate significant change with no subsequent worsening – is acceptable as long as it leads to reserves no lower than would apply if assumptions which gradually worsen over time were adopted. Other factors might need to be overlaid on this; for example, experience on pensions contracts as retirement age is approached or behaviour at dates when valuable options are available.

10.4 When considering the amount payable to a policyholder on voluntary discontinuance, the guidance in paragraphs 9.9 to 9.11 above must be followed.

11 Reinsurance

11.1 There is a long established principle of actuarial valuation (which differs from accounting practice), that contingent cashflows under a contract may be offset against other earlier cashflows which necessarily occur before the contingent cashflows, irrespective of the parties involved. In particular, obligations to make payments to reassurers which arise only after and to the extent of the receipt of a specific item of cash inflow under a long term business contract are properly valued together with that item of cash inflow. This covers premiums payable and charges deducted from contracts, but does not extend to generalised cashflows, such as those arising from assets, whether actually held or notional. However, in the context of obligations to make payments to reassurers, this actuarial principle is only applicable where specific items of cash inflow can be identified which trigger a requirement to make a payment, and their non-receipt avoids that payment. Otherwise the reassurance cash outflow items must be valued as separate liabilities under PRU 7.3.22R(3), unless exempted under PRU 7.3.79R.

11.2 Whilst the actuarial valuation can therefore take advantage of offset where offset might not apply in accounting terms (due only to the differing parties involved), the valuation cannot thereby avoid the recognition of liabilities, but solely may permit the use of cash inflows not otherwise used in the valuation to meet cash outflows the occurrence of which are fully dependent on that inflow occurring. This difference of approach should not alter the overall assessment of the financial position, except to the extent that an accounting approach might include the recognition of an asset which would not be an *admissible asset*. This offsetting is, however, permissible under the terms of the Life Directive, and is not prevented by PRU 7.3.

11.3 Rule 7.3.79R(2) specifies the situations where re-insurance cash outflows need not be valued and the actuarial valuation must carefully consider compliance with the conditions. The expression “emergence as surplus of margins” in sub-paragraph (2) would appear to exclude margins which arise to reduce a deficit. Rule PRU 7.3.86R further limits the surpluses which may be applied in this context. Sub-paragraph (3) of rule 7.3.79R excludes any inflows which depend on other contingencies than the reinsured risks such as, for example, receipts in respect of losses on early termination.

12 Resilience capital requirement

12.1 PRU 4.2.10R requires the calculation of a *resilience capital requirement*.

12.2 PRU 4.2.10R requires the identification of assets equal in value to the *mathematical reserves*. Guidance on this has been given in PRU 4.2.10AR and in paragraph 5.5 above.

12.3 When determining the maximum interest rate applicable under PRU 4.2.16R(3) in the changed investment conditions, it is necessary to allow for the revised

internal rate of return on fixed interest securities at their new value. PRU 4.2.17R sets out the required assumptions for equity earnings and dividends and for property rental income. Allowance must then be made for the impact of the change in market values on the corresponding yields. A revised allocation of assets may also be made to each class of policy, although only from those assets originally identified for the purposes of PRU 4.2.10R(2).

12.4 In the changed investment conditions, any margins in the valuation basis that are not strictly required by the rules may be reduced or removed provided the revised valuation basis still satisfies PRU 7.3. However, PRU 7.3.10R(2) requires that in the calculation of *mathematical reserves*, there are no arbitrary changes in methods and assumptions from year to year. This means that, when calculating the *resilience capital requirement*, there can be no changes to the assumptions other than those changes that can reasonably be expected to result from the changes in economic conditions. This restriction does not preclude the introduction of a zillmer adjustment, which may be considered as an offset to the reduction in net premium caused by an increase in the valuation interest rate. The amount of any such zillmer adjustment must be justified by reference to the change in net premium.

12.5 For with-profits business, the liability in the changed investment conditions must adequately cover policyholders' (revised) reasonable expectations, including any expectations in relation to immediate surrender values.

12.6 Where the assets or liabilities identified for the purposes of PRU 4.2.10R (2) include derivative contracts, these must be revalued on an estimated market value basis in the changed investment conditions. Where a provision has been established in respect of ensuring cover within the terms of PRU 4.3.14R and PRU 4.3.17R, that provision will need review in the changed conditions, but no further prudential provision to cover market risk need be established.

12.7 When calculating the *resilience capital requirement* in respect of unit-linked business, the changed investment conditions will have an impact on future charges which will in turn change the non-unit reserve. Allowance must be made for the effect of the changed investment conditions on the valuation interest rate and other assumptions used in the calculation of non-unit reserves. When considering this, the guidance in paragraph 4.4 above may be relevant.

12.8 PRU 7.2.34R to 7.2.40G set out the requirement for *firms* to ensure that the cash inflows from the assets held to cover technical reserves under PRU7.2.20R and 7.2.21R will meet the expected cash outflows from the *long-term insurance liabilities* as they fall due. PRU 7.2.40G states that this may mean that a *firm* has to hold assets of a value greater than would otherwise be required by the general rule in PRU 7.2.20R. This requirement is outside the *long-term insurance liabilities* and therefore meeting such a requirement is not required to be tested in determining the *resilience capital requirement* under PRU 4.2.10R. Furthermore, assets within the *long-term insurance fund* meeting the *resilience capital requirement* can also be applied to meet PRU 7.2.34R to PRU 7.2.40G simultaneously.