Technical Paper

Review of capital standards for general insurers and life insurers
Capital base and insurance risk capital charge for life insurers

12 July 2010

Preamble

APRA is reviewing its capital standards for general insurers and life insurers.

This technical paper is part of a series of papers that outline APRA's proposals to update the capital standards for both general insurers and life insurers. The first of this series of papers was a discussion paper issued on 13 May 2010, which set out APRA's proposed changes to capital standards at a conceptual level.

This technical paper describes in detail APRA's proposals for determining:

- the capital base of life insurance statutory funds; and

- the amount of capital that statutory funds must hold in respect of insurance and insurance concentration risks, referred to as the insurance risk capital charge.

APRA is releasing two other technical papers, one in respect of the proposed asset risk capital charge for both general insurers and life insurers, and the other in respect of the insurance concentration risk capital charge for general insurers.

APRA will invite insurers to participate in a quantitative impact study (QIS). Details of the QIS will be issued shortly.

APRA is inviting comment on the proposals discussed in this technical paper. Written submissions should be emailed to InsuranceCapital@apra.gov.au by 29 October 2010 and addressed to:

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Important

Submissions will be treated as public unless clearly marked as confidential and the confidential information contained in the submission is identified.

Submissions may be the subject of a request for access made under the *Freedom of Information Act 1982* (FOIA). APRA will determine such requests, if any, in accordance with the provisions of the FOIA.

Contents

Glossary

ADI	An authorised deposit-taking institution under the *Banking Act 1959*.
APRA	Australian Prudential Regulation Authority
Appointed Actuary	The actuary appointed under the *Life Insurance Act 1995*.
BCBS	Basel Committee on Banking Supervision
BETV	Best Estimate Termination Value as defined in this paper.
BTV	Base Termination Value as defined in this paper.
Capital base	The capital that APRA determines is suitable for the purpose of meeting the Prudential Capital Requirement.
CICP	Claims in course of payment.
Expenses	Servicing expenses as defined in *Prudential Standard LPS 7.02 General Standard*.
Friendly society	A friendly society as defined in the *Life Insurance Act 1995*.[1]
General fund	The management fund for a friendly society or the shareholders' fund for other life companies.
General insurer	A general insurer authorised under the *Insurance Act 1973*.
GPS 112	*Prudential Standard GPS 112 Capital Adequacy: Measurement of Capital*
IAAust	Institute of Actuaries of Australia
IBNR	Incurred but not reported
IFR	Investment Fluctuation Reserve
Lapse	Voluntary discontinuance of a life insurance policy, whether or not a surrender value is payable.
LIASB	Life Insurance Actuarial Standards Board
Life insurer	A life company registered under the *Life Insurance Act 1995* (includes friendly societies).
Life Act	*Life Insurance Act 1995*
LPS 1.04	*Prudential Standard LPS 1.04 Valuation of Policy Liabilities*
LPS 2.04	*Prudential Standard LPS 2.04 Solvency Standard*
LPS 3.04	*Prudential Standard LPS 3.04 Capital Adequacy Standard*
LPS 7.02	*Prudential Standard LPS 7.02 General Standard*
Policyholder	Includes policy owner as referred to in the *Life Insurance Act 1995*
PPL	Participating Policyholder Liability as defined in this paper.
Prescribed capital amount	The capital required under the proposed APRA prudential standards, before any supervisory adjustment is applied.

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[1]   In this paper the terminology relating to friendly societies follows, in general, the conventions of the *Life Insurance Act 1995* and APRA's existing standards. For example references to statutory funds should be read as references to benefit funds, unless otherwise stated.

PRP	Australian policy owners' retained profits pool as defined in section 61 of the *Life Insurance Act 1995*.
Prudential capital requirement	The capital required under the proposed APRA prudential standards, after any supervisory adjustment has been applied.
QIS	Quantitative Impact Study
RBNA	Reported but not admitted
RFBEL	Risk-free Best Estimate Liability as defined in this paper.
RFVFB	Risk-free Value of Future Bonuses as defined in this paper.
RFVFSP	Risk-free Value of Future Shareholder Profits as defined in this paper.
Risk business capital taskforce	A taskforce established by the Institute of Actuaries of Australia's Life Insurance and Wealth Management Practice Committee to review the basis of the capital requirements for protection business and annuitant mortality assumptions.
Solvency II	European Commission initiative to reform its insurance regulatory requirements.
SRPP	Shareholders' retained profits (Australian participating) pool as defined in section 61 of the *Life Insurance Act 1995*.
Tier 1 capital	Comprises the highest quality capital components and is defined in *Prudential Standard GPS 112 Capital Adequacy: Measurement of Capital*.
Tier 2 capital	As defined in GPS 112, includes other components of capital which, to varying degrees, fall short of the quality of Tier 1 capital but nonetheless contribute to the overall strength of an institution as a going concern.
TPA	Total Participating Assets as defined in this paper.
TPD	Total and permanent disablement
VASF	Value of the assets of a life insurance statutory fund.
YRT	Yearly renewable term

Chapter 1 – Introduction

APRA issued a discussion paper on 13 May 2010 outlining its proposals for changes to the prudential standards that determine the regulatory capital requirements of general insurance and life insurance companies.[2]

The reasons for change were described in detail in the discussion paper. In brief, in undertaking this review, APRA is seeking to:

- improve the risk sensitivity and appropriateness of the capital standards in general and life insurance; and

- where appropriate, improve the alignment of the capital standards across industries.

In the discussion paper, APRA proposed that:

- the current solvency and capital adequacy requirements for statutory funds be replaced with a single new measure of capital; and

- the current approach that compares total assets to a total capital adequacy or solvency requirement be translated into an approach that compares a statutory fund's capital base with its required capital.

As explained in the discussion paper, APRA intends that the definition and measurement of the capital base for life insurers be consistent with that for ADIs and general insurers.

The proposed framework for required capital was described in the discussion paper. It includes capital charges for asset risk, asset concentration risk, insurance risk, insurance concentration risk and operational risk.

This technical paper provides further details of APRA's proposals for determining:

- the capital base of life insurance statutory funds; and

- the component of required capital that statutory funds must hold in respect of insurance and insurance concentration risks, referred to as the insurance risk capital charge.

The paper does not describe how to determine the capital base for the general fund of a life insurer. APRA will consult with industry on this issue at a later date.

APRA intends to evaluate its capital proposals by assessing the results of a quantitative impact study (QIS) in which all life insurers will be invited to participate. The QIS is expected to be issued in July and insurers will be given three months to complete it. APRA expects its proposals for the new capital standards to be finalised during 2011 and implemented in 2012. All details of methodology and parameters in this technical paper should be considered indicative only and subject to change until the final prudential capital standards are issued.

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2 Including friendly societies.

Chapter 2 – APRA's principles for determining the capital base

APRA intends that eligible capital or 'capital base' would be consistent across ADIs, general insurers and life insurers. The amounts that are, at present, eligible to be included in a general insurer's capital base are set out in *Prudential Standard GPS 112 Capital Adequacy: Measurement of Capital* (GPS 112). The equivalent standard for ADIs is *Prudential Standard APS 111 Capital Adequacy: Measurement of Capital* (APS 111).

A key aspect of APRA's existing capital standards for ADIs and general insurers is the quality of eligible capital. Factors considered in determining the quality of a capital instrument include whether the instrument:

- provides a permanent and unrestricted commitment of funds;

- is freely available to absorb losses;

- does not impose any unavoidable servicing charges against earnings; and

- ranks behind the claims of policyholders and creditors in the event of the winding up of the insurer.

Not all capital instruments meet these criteria equally. Hence, APRA imposes restrictions on the composition of an ADI's or general insurer's capital that is eligible to be included in its capital base.

APRA's practice has been to closely follow the Basel Committee for Banking Supervision (BCBS) in respect of ADIs, and to maintain consistency of capital definitions for ADIs and general insurers. APRA expects to continue this practice and to extend this approach to life insurers.

As explained in the discussion paper, the BCBS is undertaking a review of capital standards. APRA intends to wait until international developments are clearer, and consult with industry, before finalising its position on the classification of capital instruments.

Appendix A to this paper describes the components of a general insurer's capital base under the existing standards. The components include:

- Tier 1 capital instruments, such as paid-up ordinary share capital and preference shares; and

- Tier 2 capital instruments, such as subordinated debt.

The information in Appendix A is provided by way of background for the next chapter, which defines the proposed capital base for a statutory fund.

Chapter 3 – Capital base of a statutory fund

APRA is proposing to introduce the concept of eligible capital or capital base for life insurers as a key component of the proposed structure of capital requirements for the industry, as outlined in the discussion paper.

One of the challenges in aligning the capital base for life insurers with that of ADIs and general insurers is the legal structure that applies to life insurers.

Life insurers have a general fund (the management fund for a friendly society or the shareholders' fund for other life insurance companies) and one or more statutory funds (known as approved benefit funds for a friendly society).

The concepts of paid-up ordinary share capital and preference shares may be applicable for the general fund, but they do not apply to statutory funds.

A statutory fund is a fund that is:

- established in the records of a life company; and

- relates solely to the life insurance business of the life company or a particular part of that business.

Section 61 of the *Life Insurance Act 1995* defines various pools of retained profits and shareholders' capital in respect of statutory funds:

- Australian policy owners' retained profits;

- overseas policy owners' retained profits;

- shareholders' capital;

- shareholders' retained profits (Australian participating); and

- shareholders' retained profits (overseas and non-participating).

In general purpose financial statements, Australian and overseas policy owners' retained profits are shown as unvested policyholder benefits, and only shareholders' capital and the two shareholders' retained profits pools are shown as equity.

Many friendly society approved benefit funds report nil shareholder equity. Shareholder equity may arise in a benefit fund where its rules provide that surplus can only be transferred to the general fund.

APRA's proposed starting point for defining the capital base of a statutory fund is the shareholders' net assets (shareholders' capital and the two shareholders' retained profit pools). However, in order to ensure that the capital base is not overstated (nor understated), APRA is proposing that adjustments be made to the assets and liabilities reported in the statutory accounts for APRA purposes.

APRA's proposed adjustments to policy liabilities are discussed in sections 3.1 to 3.3 of this paper. In brief, APRA is proposing that policy liabilities would be adjusted to be the best estimate value of the liabilities to policyholders, subject to a minimum of the amount that would be payable on voluntary termination.

Further adjustments would be required for participating business and non-participating business where there is a discretionary entitlement to share in investment experience. The aim of these adjustments would be to ensure that policyholders' entitlements to future discretionary additions are not treated as part of the capital base. APRA requires that the capital base be freely available to absorb losses and rank behind the claims of policyholders and other creditors in the event of winding-up. Funds that can only be distributed to particular groups of policyholders do not satisfy these requirements.

As in the existing solvency and capital adequacy standards, there may also be some adjustment required to the 'other liabilities' if these are not at fair value. An example is defined benefit superannuation fund deficits in certain circumstances. Further details are provided in section 3.4 of this paper.

Deductions or other adjustments would apply in respect of certain assets. The proposed adjustments are discussed in section 3.5.

Lastly, APRA proposes that insurers would be able to include certain Tier 2 capital instruments such as subordinated debt (or seed capital for a friendly society approved benefit fund) in the capital base for a statutory fund. However, as noted in Chapter 2, APRA does not intend to finalise its position on the classification of capital instruments until international developments are clearer.

APRA proposes that the capital base would be determined net of tax and net of all reinsurance.

While the capital base (and the insurance risk capital charge) would be determined net of reinsurance, it is intended that the asset risk capital charge include a component in respect of the risk of reinsurer credit default.

Figure 1 provides a diagrammatic representation of the balance sheet of a statutory fund on a net-of-reinsurance basis. Assets are shown in the left-hand column, liabilities and equity in the centre column. The shaded items in the right-hand column depict the proposed capital base, comprising net Tier 1 capital and net Tier 2 capital.

Figure 1— Balance sheet, net of reinsurance, and identification of proposed capital base for a life insurance statutory fund
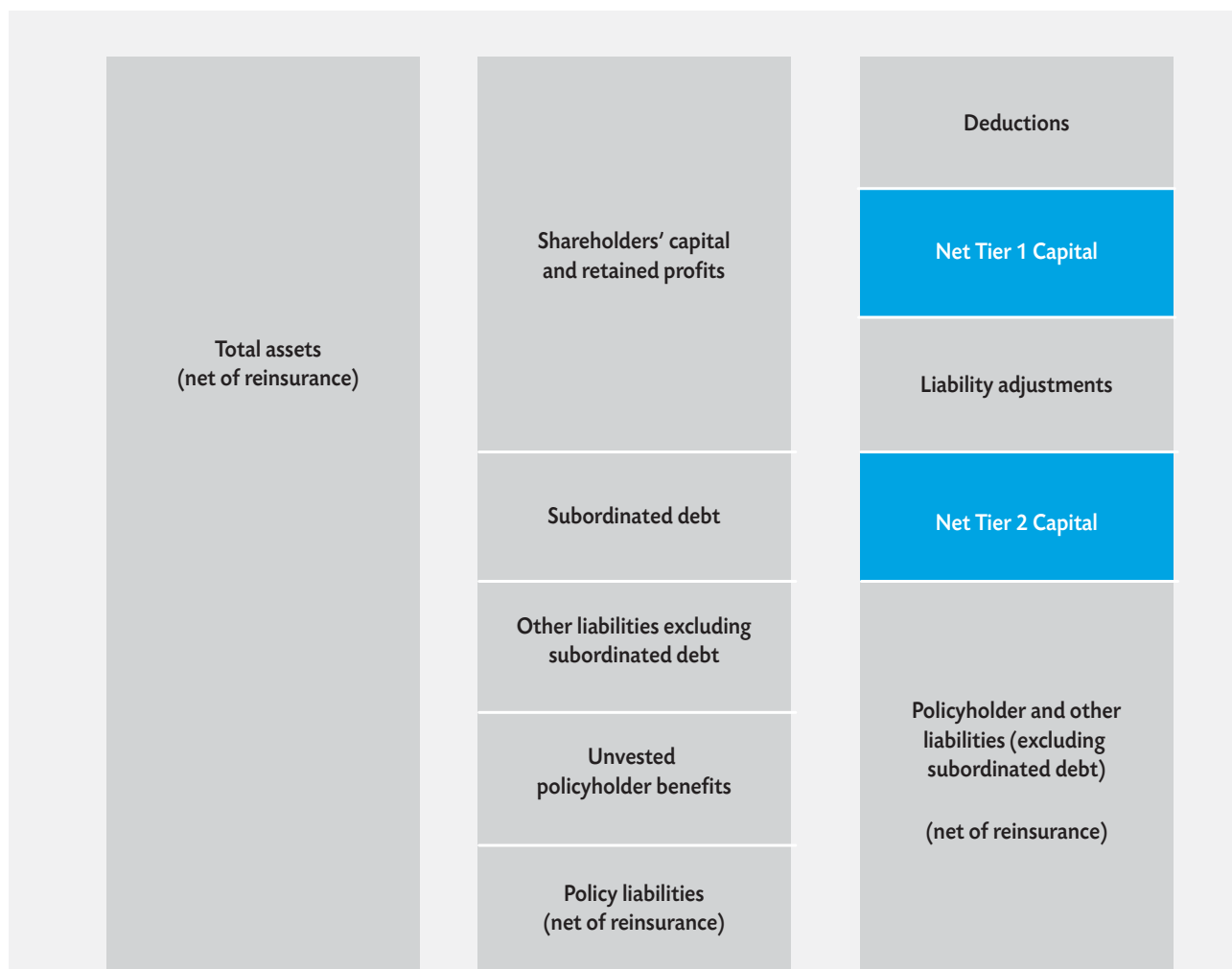
In some cases, for example friendly society approved benefit funds with nil shareholder equity, the capital base may be nil. This would be permitted where the Prudential Capital Requirement (PCR) was also nil, for example in many unit-linked approved benefit funds. Capital in respect of expense and operational risks for these funds would be held in the society's general fund.

The remainder of this chapter is structured as follows:

- Section 3.1 describes the adjustments that would be made to policy liabilities for non-participating business with benefits providing no discretionary entitlement to share in the investment experience;

- Section 3.2 describes the adjustments that would be made to policy liabilities for non-participating business with discretionary benefits;

- Section 3.3 describes the adjustments that would be made to policy liabilities for participating business;

- Section 3.4 describes the adjustments that would be made to non-policy liabilities; and

- Section 3.5 describes the proposed deductions that would be made in respect of certain assets.

3.1 Liability adjustments for non-participating business without discretionary benefits

As discussed earlier in this chapter, APRA is proposing that the policy and other liabilities be adjusted for the purpose of measuring the capital base. The adjustments may act to increase or reduce the size of the capital base relative to the reported value of shareholders' net assets in the general purpose financial statements. The purpose of the adjustments would be to ensure that the capital base is neither overstated nor understated.

For non-participating business with no discretionary entitlement to share in investment experience, APRA is proposing that the adjusted liability be determined as the greater of the Risk-free Best Estimate Liability (RFBEL) and the Best Estimate Termination Value (BETV). These terms are defined in sections 3.1.1 and 3.1.2 respectively.

The test of which is greater, RFBEL or BETV, would be applied to a group of policies. Insurers would not need to apply the test at the related product group level that applies under the existing solvency and capital adequacy standards.[3] However, insurers would not be permitted to use groupings that are broader than the APRA product groups specified in APRA's reporting forms.

APRA is proposing to modify the existing APRA product groups by subdividing the existing L4 product group into a 'stepped premium individual lump sum risk' product group, L4 stepped, and a 'level premium individual lump sum risk' product group, L4 level. The existing L5 product group would be similarly subdivided.

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3 Appendix B to this paper includes a brief overview of the existing solvency and capital adequacy standards.

The proposed APRA product groups are shown in the table below.

Table 1 — Proposed APRA product groups

APRA product groups for friendly societies	
F1	Education
F2	Investment Account
F3	Annuity and Superannuation
F4	Risk
F5	Prepaid Funeral
F6	Investment Linked
APRA product groups for life insurers other than friendly societies	
L1	Conventional Participating
L2	Participating Investment Account
L3	Annuity with Longevity Risk
L4 stepped	Stepped Premium Individual Lump Sum Risk
L4 level	Level Premium Individual Lump Sum Risk
L5 stepped	Stepped Premium Individual Disability Income Insurance
L5 level	Level Premium Individual Disability Income Insurance
L6	Group Lump Sum Risk
L7	Group Disability Income Insurance
L8	Non-participating Investment Policy
L9	Annuity without Longevity Risk
L10	Other

3.1.1 Risk-free best estimate liability for non-participating business

APRA proposes that the RFBEL be determined as per the Best Estimate Liability calculated under LPS 1.04 but with the gross investment yield and liability discount rate set equal to the risk-free discount rate. The risk-free discount rate would be as defined in Chapter 8 of the discussion paper.

The RFBEL would be determined for both investment and insurance contracts. The RFBEL for a product group would not need to be calculated if the Appointed Actuary can adequately demonstrate that, for the product group concerned, it would be less than the BETV.

For business that is taxed on profits, insurers would be required to hold a reserve for future tax within the RFBEL. The amount of this reserve would be determined as the tax rate multiplied by the difference between the policy liability and the best estimate liability excluding any reserve for future tax.

As noted earlier in this chapter, the RFBEL would be determined net of reinsurance.

3.1.2 Best estimate termination value for non-participating business

The BETV would be the amount payable by the insurer in the event of voluntary termination by the policyholder. For risk business, it would include the present value of claims in course of payment, reserves for reported but not admitted claims and incurred but not reported claims and reserves for unexpired risks or refunds of premium. Where relevant, items would be discounted at the risk-free discount rates using best estimate assumptions.

APRA proposes that the BETV be determined assuming that the insurer does not exercise any rights to reduce termination payments to the minimum levels permitted. The insurer would also not be permitted to allow for any tax relief that may arise because of an assumed termination of the policy and payment of the difference between the BETV and the policy liability.

The BETV would be determined net of reinsurance.

3.2 Liability adjustments for non-participating business with discretionary benefits

For business with discretionary participation features, APRA is proposing further adjustments to the liability so that reserves for future discretionary additions are excluded from the capital base.

APRA would permit insurers to use reserves for future discretionary additions to reduce the various capital charges in respect of the products to which they relate. However, these reserves would not be permitted to be included in the capital base where they might be relied on to support the capital needs for other products within the statutory fund.

This section describes APRA's proposed approach for determining the adjusted liability for non-participating investment account business where an Investment Fluctuation Reserve (IFR) is used to smooth investment returns to policyholders.

The typical characteristics of this business are listed below:

1. The IFR is used to smooth the crediting rate and, in the event of voluntary termination by a policyholder, his or her notional share of the IFR is re-allocated to the remaining policyholders.

2. The IFR can vary between +5 per cent and -3 per cent of the total investment account balances.[4]

3. The policy liabilities are determined using the accumulation approach as:

    (a) the total investment account balances; plus

    (b) the IFR (positive or negative); and less

    (c) the value of unrecouped acquisition costs.

4. The amount payable to a policyholder on voluntary termination, the BETV, is equal to:

    (a) the investment account balance; less

    (b) the exit fee (if any).[5]

5. The unrecouped acquisition costs are equal to or exceed the exit fees.

6. Nil reinsurance.

For this business, APRA proposes that the adjusted liabilities be determined for the group of non-participating investment account policies by taking the greater of:

- the total RFBEL for the group of policies; and

- the sum of the total BETV for the group of policies and, where greater than zero, the IFR.

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4 The actual limits on the size of the IFR are specified in section B of Part 3 of *Prudential Standard LPS 900 Consolidation of Prudential Rules Nos 15, 18, 22, 27 and 28*.

5 It is assumed that the policyholder would not be paid a share of the IFR on voluntary termination. Rather, his or her notional share of the IFR would be re-allocated to the remaining policyholders.

APRA will be seeking information in the QIS on whether this approach can be applied to all types of non-participating business with discretionary benefits, or if there are some insurers with business that does not meet the typical characteristics, where an alternative approach would need to be applied.

3.3 Liability adjustments for participating business

For participating business, as for non-participating business with discretionary additions, APRA is proposing to adjust the policy liabilities in order to ensure that policyholders' entitlements to future discretionary additions are not treated as part of the capital base.

APRA is proposing to define the adjusted liability for participating business in such a way that reserves for future bonuses, whether they be held within the policy liabilities or in the policyholder retained profits pool, would be excluded from the capital base.

These future bonus reserves would be held within the adjusted liabilities. When determining the various capital charges, insurers would be permitted to use the bonus reserves to reduce the capital charge in respect of the products to which they relate. However, these reserves would not be permitted to be included in the capital base because they do not meet APRA's requirement of being freely available to absorb losses and ranking behind the claims of policyholders and other creditors in the event of winding-up.

This section describes how APRA is proposing to define the adjusted liability in respect of Australian participating business. APRA expects that, where relevant, the Appointed Actuary would be able to easily adapt the formula in this section in respect of overseas participating business.

This section assumes that the insurer is starting with a 'Life Act balance sheet' that has both Australian policy owners' retained profits (PRP) and shareholders' retained profits (Australian participating) (SRPP).

As noted earlier in this chapter, the general purpose financial statements treat PRP as unvested policyholder benefit liabilities and not as retained profits.

Under a 'Life Act balance sheet', PRP may be negative. This is not permitted in the general purpose financial statements, with accounting standards requiring any negative amounts to be eliminated and recognised as an expense in the period in which they arise.

A life insurer that reports negative PRP on its 'Life Act balance sheet' will report a lower value for shareholders' retained profits in its general purpose financial statements than it reports on its 'Life Act balance sheet'.

APRA's starting point for Australian participating business would be to treat SRPP as reported on the 'Life Act balance sheet' as eligible to be included in the capital base. The actual capital base would be higher or lower, depending on whether the adjusted liabilities in respect of the participating business are less or more than the sum of the net policy liabilities and PRP.

In defining the adjusted liability in respect of Australian participating business, it is assumed that:

1. Policyholders are allocated 80 per cent of the profits arising on the business, with shareholders being allocated the remaining 20 per cent of the profits.

2. The net policy liability can be split into three components:

   (a) The Risk-free Best Estimate Liability (RFBEL) determined as per the Best Estimate Liability calculated under LPS 1.04, but with the discount rate set equal to the risk-free discount rate. The RFBEL would be determined net of reinsurance and would include the present value of future tax.

   (b) The Risk-free Value of Future Bonuses (RFVFB) calculated at the rate supported by the net policy liability using the best estimate basis but with the discount rate set equal to the risk-free discount rate.

   (c) The Risk-free Value of Future Shareholder Profits (RFVFSP) calculated at the rate supported by the net policy liability using the best estimate basis but with the discount rate set equal to the risk-free discount rate.

3. The RFVFB and RFVFSP may be zero but they cannot be negative.

4. The PRP may be positive or negative.

5. The SRPP may be positive or negative. If negative, there would presumably be positive shareholders' capital or shareholders' retained profits (overseas and non-participating) within the statutory fund.

6. In the event of voluntary termination, the amount payable to the policyholders, net of reinsurance and excluding any distribution of PRP in the form of interim or terminal bonus, is the Base Termination Value (BTV).

The diagram below is illustrative of a block of Australian participating business, with assets represented on the left hand side and components of the net policy liability, policyholder and shareholder retained profits represented on the right hand side.

In this diagram, PRP and SRPP are assumed to be positive. If PRP were negative, the insurer would likely seek to eliminate the negative PRP over time by declaring future bonuses at rates below the rate of the emerging future supportable bonuses.

APRA is proposing to permit insurers to offset negative PRP against positive RFVFB when determining the adjusted liability.

Where the future bonus reserves are insufficient to meet policyholder reasonable expectations, insurers would be required to hold capital as part of the insurance risk capital charge.

On the right hand side of the diagram, 'policyholder components' are shaded blue while 'shareholder components' are shown in light grey. The net policy liability (NPL) is shown within the thick border. The total participating assets (TPA) comprise the sum of the NPL, PRP and SRPP.

Figure 2 — Diagram representing Australian participating business
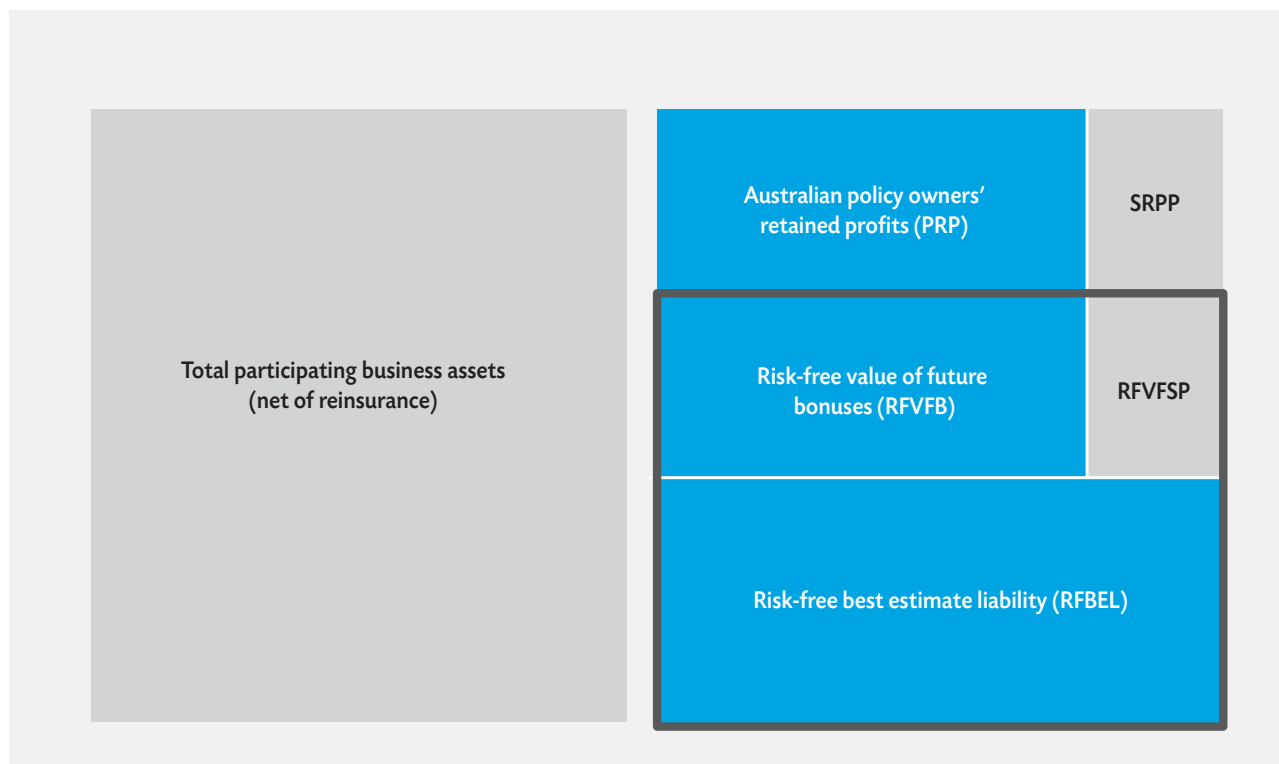
APRA is proposing that the adjusted liability for Australian participating business be determined in accordance with the following formula. The rationale for the formula is discussed below.

Adjusted liability = RFBEL + max { RFVFB + PRP , 0 }

+ 20 per cent x max { min { BTV , TPA } − RFBEL , 0 } + max { BTV − max { RFBEL , TPA } , 0 }

In the situation illustrated in Figure 2, if the BTV is less than the RFBEL, the adjusted liability would be equal to the shaded policyholder components. Both the SRPP and the RFVFSP would be included in the capital base.

If the BTV is more than the RFBEL but less than the NPL, the capital base would include all of the SRPP and part of the RFVFSP.

If the BTV exceeds the NPL, the adjusted liability would exceed the sum of the NPL and PRP. The capital base would be less than the SRPP.

The capital base would also be less than the SRPP where the PRP is negative and the RFVFB is insufficient to offset the negative PRP.

The first part of the formula for the adjusted liability, RFBEL + max { RFVFB + PRP , 0 }, represents the sum of the RFBEL and, where positive, the total of the future discretionary additions (bonuses) that are implicit within or external to the policy liability.

In the formula, the RFVFB represents the reserve for future bonuses that is implicit within the policy liability while the PRP represents the reserve for future bonuses that is held outside the policy liability.

APRA is proposing that insurers be permitted to offset any negative PRP against the RFVFB. However, the adjusted liability cannot be less than the RFBEL.

The second part of the formula, 20 per cent x max { min { BTV, TPA } − RFBEL , 0 } + max { BTV − max { RFBEL, TPA } , 0 }, represents the amount of any excess of BTV over RFBEL that would be funded by the shareholder.

APRA regards the excess of BTV over RFBEL as ineligible for inclusion in the capital base. The policyholder funded portion of any excess would be excluded from the capital base because the reserves for future bonuses are being held within the adjusted liabilities.

The second part of the formula ensures that the shareholder funded portion of any excess of BTV over RFBEL would be excluded from the capital base. The formula assumes that the shareholder would fund 20 per cent of any excess of BTV, to a maximum of TPA, over RFBEL and 100 per cent of any further excess.

The Participating Policyholder Liability (PPL) would be defined to be:

PPL = RFBEL + max { RFVFB + PRP , 0 }

Following is a simple example to illustrate APRA's proposed method for calculating the adjusted liability for Australian participating business.

Example

An insurer has a book of Australian ordinary conventional participating business. The book of business is not reinsured. The policy liability is $50 million, comprising RFBEL of $30 million, RFVFB of $16 million and RFVFSP of $4 million.

Additionally, there are PRP of $20 million and SRPP of $5 million. The TPA is $75 million.

The BTV is assumed to be $45 million.

The components of the policy liability, policyholder and shareholder retained profits are illustrated in Figure 3.

The policy liability is shown within the thick border. The blue shading denotes the PPL, the value of which is $66 million.

Figure 3 — Example of Australian participating business
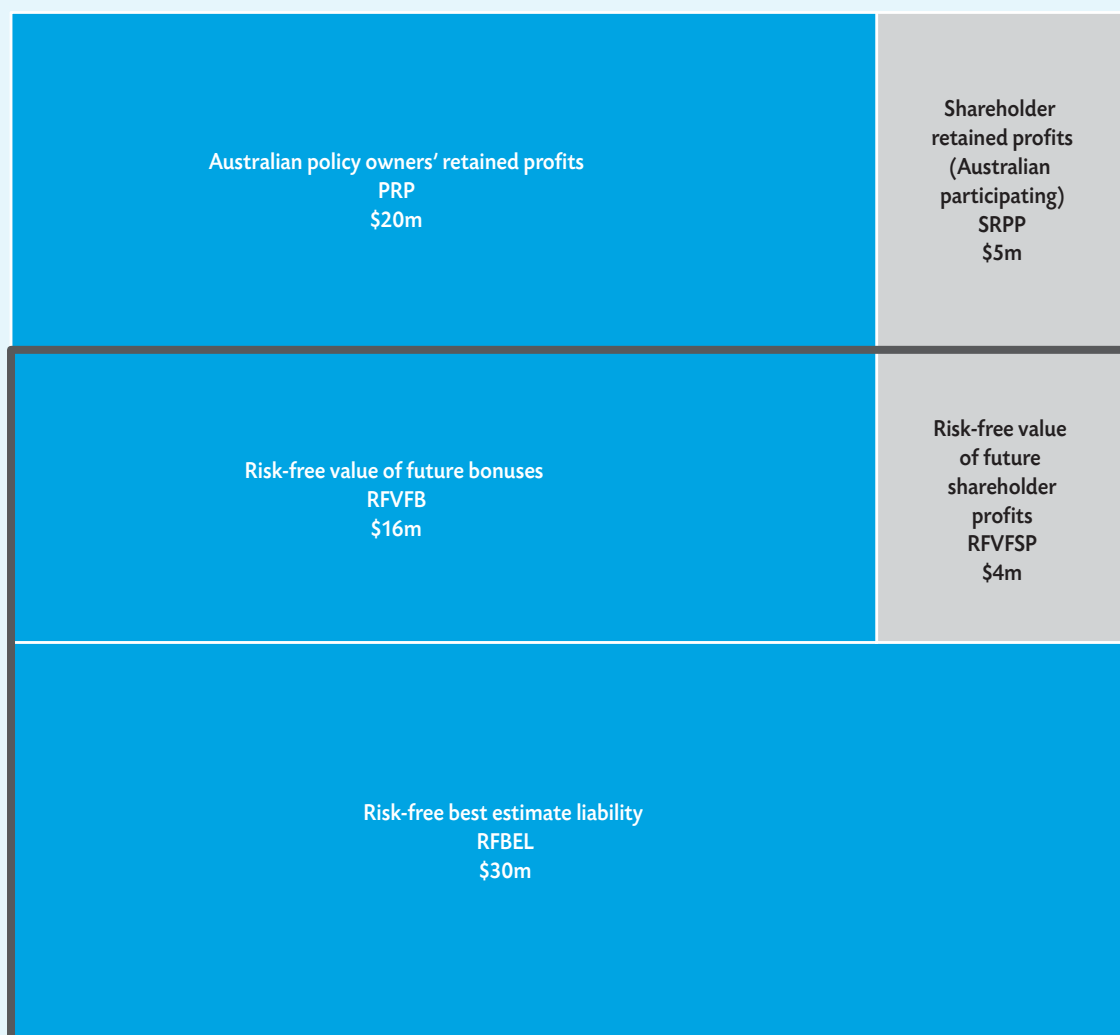
The adjusted liability is the PPL plus the shareholder funded portion of any excess of the BTV over the RFBEL. In this example, the BTV of $45 million exceeds the RFBEL of $30 million but is less than the TPA of $75 million. The shareholder funded portion of the $15 million excess of BTV over RFBEL would be 20 per cent of the excess or $3 million.

The adjusted liability would be $69 million, which is $6 million less than the total participating assets of $75 million.

The capital base would be $6 million, comprising the SRPP plus the shareholders' share of the part of the RFVFSP that would not be needed to meet payments to policyholders in the event of voluntary termination.

3.4 Adjustments to non-policy liabilities

In measuring the capital base, APRA is proposing to adjust the value of the non-policy liabilities or 'other liabilities' in certain circumstances. The value of the other liabilities of the statutory fund would be adjusted where they are not being held at fair value in the statutory accounts. An example would be defined benefit superannuation fund deficits in certain circumstances.

Where the other liabilities include a defined benefit superannuation fund deficit that has been determined using the corridor approach as defined under accounting standard *AASB 119 Employee Benefits*, APRA proposes that the deficit be increased by the amount of Unrecognised Actuarial Losses, if any, or reduced by the amount of any Unrecognised Actuarial Gains.

The purpose of this adjustment would be to ensure that other liabilities are measured at fair value when determining the capital base of the statutory fund.

APRA does not consider it appropriate for the capital base of a statutory fund to reflect the phased-in recognition of deficits that is permitted under the accounting standards.

3.5 Deductions in respect of inadmissible assets

In order to ensure that the capital base of a statutory fund is not overstated, APRA would require certain adjustments to be made to the assets of the fund. This section discusses the proposed deductions that would be made in respect of 'inadmissible assets'.

The existing capital standards for life insurance statutory funds feature an inadmissible asset reserve so that certain assets, for example unsecured loans to directors, are unavailable to back other components of the capital requirements.

The existing inadmissible asset reserve also includes reserves for asset concentration risk.

Under the proposed standards, the asset risk capital charge would incorporate a requirement to hold capital in respect of asset concentration risks.

The other component of the existing inadmissible asset reserve would be treated as a deduction from the capital base.

APRA proposes to more closely align the inadmissible asset requirements for general insurers and life insurers by treating the following assets as inadmissible:

• goodwill and any other intangible assets;

• deferred tax assets net of deferred tax liabilities;

• defined benefit superannuation fund surpluses; and

• for all subsidiaries, associates and joint ventures, any excess of value over net tangible assets, plus any required prudential capital.[6]

Where the policyholder bears the investment risk, an asset that would otherwise be treated as inadmissible would be permitted to be treated as admissible, but only to the extent that its value had been recognised within the adjusted liability. For this to occur:

• the benefits under the policy would need to be contractually linked to the performance of the asset;

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6   Refer to Chapter 4 of the discussion paper.

- the extent of the exposure to the asset would need to be consistent with the stated investment objectives; and

- the Appointed Actuary would need to be satisfied that there had been appropriate disclosure to policyholders of the risks to which they were exposed.

As a result of APRA's proposals, the following assets, treated as admissible under LPS 2.04, would become inadmissible:

- deferred tax assets in excess of deferred tax liabilities that are considered realisable in the context of the solvency scenarios; and

- readily realisable intangibles in independent non-financial services entities.[7]

The below items, inadmissible under LPS 2.04, would be regarded as admissible:

- unsecured loans to directors, employees, advisers and related parties; and

- the excess of policy loans, and overdue premiums for direct insurers, over current termination values.

While unsecured loans would be treated as admissible, in some instances a 100 per cent factor would be applied in the asset risk capital charge default module.[8]

Further deductions or adjustments may be applied where assets of a statutory fund have not been determined at fair value.

While the accounting standards require assets backing policy liabilities to be fair valued, there can be assets in a statutory fund in excess of those required to back policy liabilities that have not been fair valued. APRA proposes that these assets be fair valued when determining the capital base.

7   Financial services entities are defined in LPS 7.02.

8   See the Technical Paper *Review of capital standards for general insurers and life insurers – Asset risk capital charge*.

Chapter 4 – Approach to determining the insurance risk capital charge for life insurers

APRA proposes that, for life insurers, the insurance risk capital charge be the amount of capital required to cover the risk that experience for any of mortality, morbidity, longevity, voluntary discontinuance and expenses is worse than best estimate. The capital charge would allow for adverse experience arising due to random fluctuations in experience, extreme events, mis-estimation of the mean or adverse trends developing over time.[9]

A brief overview of the existing solvency and capital adequacy standards is included in Appendix B to this paper. As discussed in the appendix, both standards use the following approach:

(a) for each related product group (RPG), determine a stressed liability, either the total Solvency Liability or the total Capital Adequacy Liability;

(b) for each RPG, determine a stressed termination value, either the total Minimum Termination Value or the total Current Termination Value; and

(c) for each RPG, take the greater of the stressed liability and the stressed termination value and aggregate the result across the statutory fund.

APRA is proposing to maintain the existing approach of determining, for groups of products, a 'prudent liability' calculated as the greater of a stressed liability and a stressed termination value. The product groupings would be the same as those applying in deriving the adjusted liabilities that are used in determining the capital base.

The insurance risk capital charge would be derived by aggregating across the product groups the excess, if any, of the prudent liability over the adjusted liability (determined as outlined in Chapter 3).

APRA is proposing to change the approach to determining the stressed liabilities and termination values. The key differences are:

1. Unlike the existing approach, where the stressed assumptions have no explicit allowance for diversification, APRA is proposing that stressed mortality, morbidity and longevity assumptions be determined before allowing for diversification. Diversification benefits would be recognised by applying a prescribed correlation matrix.

2. In addition to the future stresses[10], for mortality and morbidity, life insurers would be required to apply margins for random fluctuations in experience and extreme events that may occur in the next 12 months.

3. There would be an explicit requirement to consider the timing of the cash flows. It cannot be assumed that losses in the short term are expected to be recovered by profits in the longer term.

4. While it would continue to be permitted to assume that management exercises discretions (such as repricing) in response to adverse insurance risk experience, APRA would introduce restrictions in respect of the assumed repricing.

APRA is proposing that the insurance risk capital charge be determined on a net of reinsurance basis. However, for the purposes of determining the reinsurer credit default risk component of the asset risk capital charge, calculations would also need to be performed on a gross-of-reinsurance basis.

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9   In this technical paper: 'mortality' relates to the mortality of insured lives; 'morbidity' relates to total and permanent disablement, trauma and income protection (both claims incidence and claims termination); and 'longevity' relates to the mortality of lifetime annuitants.

10 As defined in Table 2.

The requirement to do calculations both net and gross of reinsurance arises because APRA proposes that the reinsurer credit default risk be quantified based on the difference between:

- the sum of the adjusted liabilities and insurance risk capital charge assuming there were no reinsurance (i.e., gross-of-reinsurance basis); and

- the sum of the adjusted liabilities and insurance risk capital charge after taking into account the reinsurance (i.e., net-of-reinsurance basis).

Calculations on a gross-of-reinsurance basis would also be required for the purposes of determining any asset concentration risk capital charge in respect of reinsurance assets. Further details will be provided in the QIS.

Table 2 sets out the process for determining the insurance risk capital charge. Further detail is provided in later chapters. The process involves a number of steps, including determining various margins and adjustments. APRA envisages that the detailed analysis underpinning the process would only be undertaken annually and that the calculation of the insurance risk capital charge at a reporting date would not be unduly onerous. Specifically, APRA proposes that Steps 1 to 7 be permitted to be undertaken annually as part of the experience investigation, with Steps 8 to 10 being applied at the reporting date.

The table does not describe the stresses that would be applied to the assumptions for voluntary discontinuances (referred to as 'lapses' in this paper) or to servicing expenses (referred to as 'expenses' in this paper).[11] The stresses to lapse and expense assumptions that APRA would require are discussed in Chapter 5. APRA is proposing that lapse and expense stresses be applied at the same time as the mortality, morbidity and longevity stresses. Insurers would not be permitted to assume any diversification benefits between the lapse and expense stresses and the other types of stresses that are applied.

The table also does not describe the stresses that would be applied to other miscellaneous assumptions, such as option take-up rates or other insured events. APRA would expect the Appointed Actuary to determine the appropriate stresses to be applied to these assumptions.

Table 2 — Steps required in determining the insurance risk capital charge

Step	Description
Step 1 – Margins	Determine the margins to be applied to the best estimate mortality and morbidity assumptions. The margins are to be determined at a 99.5 per cent probability of sufficiency without allowing for diversification.
	For mortality and morbidity separate margins are required for:
	• random fluctuations in experience that may occur in the next 12 months (random stress);
	• extreme events that may occur in the next 12 months (event stress); and
	• mis-estimation of the mean and adverse trends that may apply from the reporting date for the remaining term of the liabilities (future stress).
	The margins would be applied in individual stress scenarios (i.e., applying the lapse and expense stresses and only one of the margins) and, after adjusting for diversification, in a combined stress scenario (i.e., applying the lapse and expense stresses and all the margins, adjusted for diversification, simultaneously).
Step 2 – Discretions	Subject to APRA restrictions, determine the management discretions that would be applied under each of the stress scenarios in Step 1.

11 In this technical paper, voluntary discontinuances will be referred to as 'lapses' and the term 'expenses' will be used to refer to servicing expenses, defined in LPS 7.02 to be the combination of a life insurer's maintenance and investment management expenses.

Step	Description
Step 3 – Impacts	Quantify the impacts on both the liabilities and termination values of applying the margins in Step 1, after allowing for the discretions in Step 2. The impacts would be determined under the individual stress scenarios, with the results being used in a later step to calculate the diversification benefit.
Step 4 – Aggregate impacts	For both the liabilities and termination values, determine the total dollar impact across the statutory fund, after discretions, for each of the below types of stress: • future mortality stress; • random mortality stress; • event mortality stress; • future morbidity stress; • random morbidity stress; • event morbidity stress; and • longevity stress. The dollar impact for each stress would be determined from the difference between: • the liabilities or termination values in a scenario where the lapse and expense stresses are applied together with the particular stress; and • the liabilities or termination values in a scenario where only the lapse and expense stresses are applied.
Step 5 – Diversification factors	For both the liabilities and termination values, calculate a diversification factor by combining the dollar impacts from Step 4 using an APRA-specified correlation matrix. The diversification factor would be calculated as the ratio of the combined impact, adjusted for diversification, divided by the sum of the individual dollar impacts pre-diversification.
Step 6 – Adjusted margins	Adjust the margins from Step 1 using the diversification factors from Step 5 to give adjusted margins that can be applied in determining the stressed liabilities and termination values. The adjusted margins would be applied simultaneously.
Step 7 – Adjusted discretions	Subject to APRA restrictions, determine the management discretions that would be considered appropriate after allowing for diversification. These are the discretions that would be applied under the simultaneous stress scenario from Step 6.
Step 8 – Stressed liabilities and termination values	Determine the stressed liabilities and termination values by applying the adjusted margins and adjusted discretions simultaneously. At this step, it is not permitted for stressed liabilities to be determined assuming that losses in the short term are recovered by profits in the longer term.
Step 9 – Prudent liabilities	For each group of products, determine the prudent liability as the greater of the stressed liabilities and stressed termination values.
Step 10 – Insurance risk capital charge	For each group of products, determine the excess, if any, of the prudent liabilities over the adjusted liabilities. Aggregate these amounts across the statutory fund to give the insurance risk capital charge.

The next chapter discusses the margins that would be applied to the best estimate assumptions in deriving stressed liabilities at a 99.5 per cent probability of sufficiency.

Chapter 5 – Margins applying to the best estimate assumptions when determining the insurance risk capital charge

This chapter sets out APRA's proposals for determining the margins to be applied to best estimate assumptions for the purposes of determining the insurance risk capital charge. APRA's proposals have been influenced by:

- the existing approaches used by Australian life insurers to determine their solvency liabilities and capital adequacy liabilities;

- the recommendations of the Risk Business Capital Taskforce of the Institute of Actuaries of Australia;

- the Solvency Capital Requirement (SCR) life underwriting risk and health underwriting risk modules that form part of the SCR standard formula calculation under the Solvency II proposals; and

- the approaches used by Australian general insurers when determining balance sheet liabilities at a 75 per cent probability of sufficiency.

Further background is provided in Appendices C and D to this paper with:

- Appendix C setting out the stresses that are being proposed under Solvency II; and

- Appendix D describing a proposed framework for assessing risk margins included in the 75 per cent probability of sufficiency liabilities of Australian general insurers. The framework is the one proposed by the (general insurance) Risk Margins Taskforce of the Institute of Actuaries of Australia in the November 2008 draft paper *A Framework for Assessing Risk Margins*.

One of the main differences between the standard formula calculation under Solvency II and the APRA proposals is that, for the Solvency II SCR, the quantum of all the stresses is prescribed. The prescribed stresses are likely to represent a greater than 99.5 per cent probability of sufficiency for some insurers and a lower than 99.5 per cent probability of sufficiency for other insurers.

APRA is proposing that some of the margins would be specified by APRA while others would be determined by the Appointed Actuary. The margins to be specified by APRA include the lapse stress, the expense stress and the longevity stress. APRA's reasons for specifying these margins are discussed in section 5.1. APRA would also specify a mortality pandemic scenario.

APRA proposes that the Appointed Actuary determine margins in respect of future individual and group life:

- insured lives mortality;

- total and permanent disablement (TPD), trauma and income protection claims incidence; and

- income protection claims termination rates.

Further details are provided in section 5.2.

The Appointed Actuary would also determine the margins to be applied in respect of reported but not admitted claims and incurred but not reported claims, and other miscellaneous assumptions.

For its QIS, APRA intends to specify mortality and morbidity margins that can be adopted where the insurer is yet to undertake any analysis of appropriate margins. These margins will be set conservatively, assuming the insurer is relatively small.

5.1 APRA-specified margins

The margins to be specified by APRA are:

- those which it considers should be the same across industry; or

- where it simplifies the process; or

- where APRA is concerned that individual insurers would have too little data or there would be too little consistency if insurers were to set their own margin.

APRA is proposing to specify the margins for the lapse, expense and longevity stresses. Prescribing these margins would simplify the calculation of the insurance risk capital charge. The Appointed Actuary would not be required to undertake detailed analysis of the potential variability of experience in order to satisfy the criterion that the margins be targeted at a 99.5 per cent probability of sufficiency. For the longevity assumption in particular, there is unlikely to be sufficient experience data to allow insurer-specific margins to be developed.

APRA would also specify a mortality pandemic scenario. The Appointed Actuary would be required to determine a mortality margin in respect of extreme events that would be subject to a minimum of the APRA specified mortality pandemic scenario. APRA is of the view that the mortality pandemic scenario should be the same for all insurers.

APRA's proposed margins for the lapse, expense and longevity stresses and the proposed mortality pandemic scenario are shown in the table below.

For the lapse and expense stresses, no diversification benefits would apply. For the longevity stress and mortality pandemic scenario, the proposed margins are before allowing for the benefits of diversification. The approach to be used in calculating diversification benefits was outlined in Chapter 4. Further details relating to diversification are provided in Chapter 7.

5.2 Mortality and morbidity margins determined by the Appointed Actuary

This section addresses the margins to be set by the Appointed Actuary and outlines APRA's expectations in respect of the process for determining these margins.

APRA is proposing that the Appointed Actuary determine mortality and morbidity margins at a 99.5 per cent probability of sufficiency. In determining these margins, APRA would expect Appointed Actuaries to have regard to the approaches discussed in the February 2009 paper *Risk Margins and Proposed changes to Prudential Standards LPS 2.04 (Solvency) and LPS 3.04 (Capital Adequacy)* prepared by the IAAust's Risk Business Capital Taskforce.

In its paper, the Risk Business Capital Taskforce categorised the uncertainty associated with mortality and morbidity assumptions into components arising due to mis-estimation of the mean, trend and systemic risk and adverse statistical fluctuation. Table 4 describes each of these types of uncertainty. The Taskforce also considered the impact of a pandemic or shock event, its so-called 'sudden impact' risk. This is the equivalent of insurance concentration risk for general insurers. Sudden impact risk is also described in the table.

Table 3 – Proposed margins specified by APRA

Item	Stress
Lapse stress	An increase or reduction of 50 per cent to lapse rates in all future years, whichever gives the greater capital charge for the product group
Expense stress	An increase of 10 per cent in future expenses compared to best estimate
Longevity stress	A (permanent) 25 per cent decrease in mortality rates for each age
Mortality pandemic scenario	An absolute one per thousand increase in the rate of policyholders dying over the following year

Table 4 – Types of uncertainty identified by the Risk Business Capital Taskforce

Type of uncertainty	Description
Mis-estimation of the mean	The best estimate mortality or morbidity incidence assumption will typically be determined as a factor multiplied by a standard table. The factor is usually set by comparing actual deaths or claim incidence over a period to that expected by applying the standard table.
	There is a risk that the factor will be too low because, due to pure random chance, there were fewer than expected claims over the period of investigation. In Appendix D to this paper, this is referred to as the **random component of parameter risk.**
	There is also a risk that the standard table is not an accurate representation of the underlying rate of mortality or other type of claim. The table may not be based on recent data and may be the wrong shape. It may have been simplified by ignoring certain rating factors, such as smoker status, occupation class or the number of years since the policy was underwritten. For group life policies there may be approximations due to limited availability of data. In Appendix D, this is called **internal systemic risk**.
	In the Taskforce's paper, these risks are referred to collectively as the risk of mis-estimation of the mean.
Trend and systemic risk	Even if the best estimate mortality or morbidity assumptions provide an accurate representation of the current claim rates, there is a risk that future experience will be different from current experience due to external factors.
	For example, diet and lifestyle factors may cause claims experience to deteriorate; medical advances may lead to changes in diagnostic techniques with consequent impacts on trauma claim rates; economic and social factors may affect income protection claims incidence and termination assumptions.
	In Appendix D this type of risk is called **external systemic risk**. The Taskforce referred to it as trend and systemic risk.
Adverse statistical fluctuation	Even where the best estimate assumption is an accurate representation of the claim rates underlying the future experience, the actual future claim rates would be expected to vary due to pure random chance.
	In Appendix D this is referred to as the **random component of process risk**. The Taskforce categorised it as the risk of adverse statistical fluctuation.
'Sudden impact' risk	The margin for adverse statistical fluctuation allows for future claims volatility assuming independence between policies (i.e., whether there is a claim on one policy is independent of whether there is a claim on any other policy).
	This may not be the case. For example:
	• a contagious disease process may affect many persons simultaneously; or
	• an insurer that provides cover to a group of employees would be impacted by a terrorist attack or natural disaster at the site of the employer's head office.
	The Taskforce recognised this type of 'sudden impact' risk and recommended that life insurers be required to hold reserves for extreme events such as pandemics, terrorist attacks, concentrations of risk and natural catastrophes.
	The equivalent risk in general insurance is referred to as **insurance concentration risk**.

As explained in Chapter 4, APRA is proposing that Appointed Actuaries determine separate margins in respect of mortality and morbidity risks for a 'future stress', a 'random stress' and an 'event stress'.

The margin for 'future stress' would apply from the reporting date for the remaining term of the liabilities and would allow for the uncertainty arising due to mis-estimation of the mean and adverse trends.

The margin for 'random stress' would apply only in the next 12 months and would reflect the uncertainty arising due to adverse statistical fluctuations.

The margin for 'event stress' would apply only in the next 12 months and would allow for sudden impact risks. The 'event stress' mortality margin would be subject to a minimum of the APRA-specified mortality pandemic scenario.

Example

As an example, consider an insurer with 100,000 insured lives and an expected 240 claims in the next year. APRA's prescribed pandemic scenario of a one per thousand increase in the rate of policyholders dying over the following year would result in an additional 100 claims. This is a margin of 100/240 = 41.7 per cent over the best estimate assumption. In determining the 'event stress' mortality margin, the Appointed Actuary would consider not only APRA's prescribed pandemic scenario but also the risk of other extreme events that represent concentrations of risk, such as terrorist attacks and natural catastrophes. The 'event stress' mortality margin would be at least 41.7 per cent.

For all the margins determined by the Appointed Actuary, APRA would expect the Actuary to undertake detailed analysis of the potential variability of experience and to discuss the analysis undertaken and margins selected in the Financial Condition Report.

APRA expects that the level of analysis undertaken be appropriate to the materiality of the assumption. For example, if an insurer has very few reported but not admitted claims then detailed analysis of the variability in the assumed proportion of claims that will be admitted may not be warranted. In this circumstance, it may even be reasonable for the Appointed Actuary to determine a single margin in respect of all the different types of uncertainty, instead of determining separate margins in respect of mis-estimation of the mean and adverse trends, adverse statistical fluctuations and sudden impact risks.

Example

The following table provides an example of the margins that an Appointed Actuary might determine in respect of a statutory fund with individual yearly renewable and level premium term insurance business and individual yearly renewable TPD, trauma and income protection business.

These margins have been chosen for the purpose of illustrating the proposed approach to determining the insurance risk capital charge. They have been used in preparing the worked examples that appear later in this technical paper. The margins are indicative only and APRA expects actuaries to do their own analysis to determine margins that are appropriate for the particular circumstances of each statutory fund.

Table 5 – Example of margins determined by the actuary in respect of a statutory fund with individual risk business

Type of liability	Future stress (%)	Random stress (%)	Event stress (%)
Individual YRT – future insured lives mortality	10	21	53
RBNA – term	2		
IBNR – term	10		
Individual TPD – future TPD incidence	30	41	52
RBNA – TPD	50		
IBNR – TPD	30		
Trauma – future trauma incidence	35	33	13
RBNA – trauma	30		
IBNR – trauma	35		
Individual level premium term – future insured lives mortality	10	32	46
Individual income protection – future claims incidence	40	8	44
Individual income protection – future claims termination	30		
RBNA – income protection	40		
IBNR – income protection	40		

Chapter 6 – Discretions

Under the existing standards, the Appointed Actuary is allowed to assume that management would exercise discretions in response to adverse insurance risk experience. These discretions include increasing premium rates and fees and reducing bonus rates for participating business.

While it is proposed that Appointed Actuaries continue to be permitted to allow for the exercise of discretions, APRA is proposing to introduce restrictions in respect of assumed repricing.

First, APRA is proposing that a minimum period would have to elapse before the assumed repricing could take effect. The proposed minimum period is three years from the reporting date, with a longer period applying where premium rates or fees are guaranteed beyond a three-year time horizon.

The minimum period is intended to allow time for the future poor experience to emerge and for management to determine and fully implement a response.

In APRA's view, it is appropriate to assume that, were adverse experience to emerge over a one-year period, there would be at least a two-year delay until repricing was fully phased-in. APRA expects that within the three-year horizon an insurer would, at most, make a partial response to adverse experience.

The Appointed Actuary would be permitted to allow for repricing within the three-year period where the insurer already has plans to reprice, the planned repricing has the necessary management approvals, but the repricing has not already been incorporated into the best estimate assumption.

APRA is also proposing to restrict the size of the assumed increases to premium rates or fees. The maximum increase would be the lesser of:

- the amount that the actuary considers realistic, having regard to normal company practice in the adverse scenarios being considered, guarantees and obligations to policyholders, and policyholder reasonable expectations; and

- the amount that would restore the product to its previous profitability.

6.1 Pricing to restore profitability

In applying the existing standards, it is common for Appointed Actuaries to assume that stressed assumptions apply for a certain period, after which the assumptions revert to the actuary's best estimate. This approach is equivalent to assuming that, at the end of the period, management would exercise its discretion to reprice so as to restore the product to its previous profitability.

This may not be possible in practice. For example, the insurer may already be charging higher premium rates than its competitors. Management may not be prepared to increase premium rates further because it could lead to higher rates of voluntary discontinuances that would have a negative impact on the value of the business. Management may also be reluctant to increase premium rates due to sales and market share targets, or due to the economic environment.

APRA proposes that the Appointed Actuary identify the premium rate increases that would be required to restore product profitability and cap such increases at levels he or she considers realistic having regard to normal company practice in the adverse scenarios being considered.

Chapter 7 – Impacts and diversification

Under the existing standards, insurers determine stressed liabilities using stressed assumptions that include implicit allowance for diversification. A particular insurer may have a statutory fund with greater or lesser diversification than is implied by the stressed assumptions.

APRA is therefore proposing to improve the risk sensitivity of the capital standards by moving to an approach that makes explicit allowance for diversification benefits, based on the particular circumstances of the statutory fund.

In making its proposals, APRA is not intending to apply diversification benefits in respect of lapse and expense stresses. APRA would, however, recognise benefits arising due to diversification between the types of risks described in Table 6.

Table 6 – Risks for which APRA is proposing to allow diversification benefits

Type of risk	Name
The risk that future insured lives mortality will be worse than expected due to the uncertainty arising from mis-estimation of the mean or future adverse trends. It also includes: • the risk that a higher-than-expected proportion of reported but not admitted death claims will be admitted; and • the risk of a higher-than-expected rate of incurred but not reported death claims.	Future mortality stress
The risk that, during the next 12 months, insured lives mortality will be worse than expected due to the uncertainty arising from adverse statistical fluctuations. It includes the risk of a higher-than-expected rate of incurred but not reported death claims due to adverse statistical fluctuation.	Random mortality stress
The risk that, during the next 12 months, insured lives mortality will be worse than expected due to a pandemic or other type of insurance concentration risk.	Event mortality stress
The risk that future TPD, trauma and income protection claim incidence experience will be worse than expected due to the uncertainty arising from mis-estimation of the mean or future adverse trends. It also includes: • the risk that a higher-than-expected proportion of reported but not admitted TPD, trauma or income protection claims will be admitted; • the risk of a higher-than-expected rate of incurred but not reported TPD, trauma or income protection claims; and • the risk that income protection claim termination experience will be worse than expected due to the uncertainty arising from mis-estimation of the mean or future adverse trends.	Future morbidity stress

Type of risk	Name
The risk that, during the next 12 months, TPD, trauma and income protection claim incidence will be worse than expected due to the uncertainty arising from adverse statistical fluctuations. It includes the risk of higher-than-expected rates of incurred but not reported TPD, trauma and income protection claims due to adverse statistical fluctuation. An insurer may allow for the impact of adverse statistical fluctuation on income protection claim termination rates. However, it would also be acceptable for the Appointed Actuary to assume nil random morbidity stress in respect of claim termination rates, provided that a sufficient margin is applied to claim termination rates in respect of the future morbidity stress.	Random morbidity stress
The risk that, during the next 12 months, TPD, trauma and income protection claim incidence will be worse than expected due to a pandemic or other type of insurance concentration risk.	Event morbidity stress
The risk that future annuitant mortality rates are lighter than expected.	Longevity stress

APRA is proposing that insurers be permitted to recognise diversification benefits when determining both stressed liabilities and stressed termination values. Chapter 4 included an outline of APRA's proposed approach.

This chapter describes the proposed approach in greater detail and shows how it would be applied in determining the stressed liabilities. Stressed termination values would be determined using an analogous approach.

7.1 Quantifying the impact of the individual stresses on liabilities

The first step in recognising diversification benefits would be to quantify the impact of each individual stress on the liabilities. The relevant liabilities are:

- for non-participating business, the Risk-free Best Estimate Liability (RFBEL); and

- for participating business, the Participating Policyholder Liability (PPL) defined as RFBEL + max { RFVFB + PRP , 0 }.

In order to isolate the impact of each stress, APRA proposes that the insurer determine the difference between:

- the relevant liability using stressed assumptions for expenses, lapses and the particular individual stress (e.g., future mortality stress, random mortality stress etc); and

- the relevant liability using stressed assumptions for expenses and lapses only.

These liabilities should be determined after allowing for the discretions that would be applied in the particular stress scenario.

Example

Table 7 shows the liabilities that would need to be determined for a statutory fund that contains lifetime annuities, yearly renewable term (YRT), TPD, trauma and income protection business and level premium term business:

- Column (1) represents the RFBEL.

- In column (2), the liabilities have been determined using stressed expense and lapse assumptions.

- The values in column (3) use stressed expense and lapse assumptions and, depending on the product, apply the longevity stress, future mortality stress or future morbidity stress.

- Column (4) uses stressed expense and lapse assumptions and, depending on the product, the random mortality stress or random morbidity stress.

- Column (5) uses stressed expense and lapse assumptions and, depending on the product, the event mortality stress or event morbidity stress.

Table 7 – Liabilities under various stress scenarios

Type of liability	RFBEL ($)	RFBEL with expense and lapse stresses ($)	RFBEL with expense, lapse and future stresses ($)	RFBEL with expense, lapse and random stresses ($)	RFBEL with expense, lapse and event stresses ($)
	(1)	(2)	(3)	(4)	(5)
Lifetime annuities	78,811	78,888	100,894		
YRT	(321,217)	(263,820)	(246,071)	(252,828)	(235,987)
RBNA – term	6,198	6,198	6,322		
IBNR – term	15,495	15,495	17,045		
TPD	(105,004)	(82,422)	(69,727)	(76,881)	(75,474)
RBNA – TPD	8,996	8,996	13,493		
IBNR – TPD	13,493	13,493	17,541		
Trauma	(38,197)	(31,261)	(24,924)	(29,168)	(30,421)
RBNA – trauma	753	753	979		
IBNR – trauma	2,258	2,258	3,049		
Level premium term	14,566	19,368	24,148	20,749	21,362
Income protection – active lives	(40,439)	(43,711)	(16,435)	(43,094)	(40,485)
Income protection – CICP	4,923	4,923	6,265		

The next table shows the impacts of the future, random and event stresses. They have been calculated as the difference between the values in columns (3), (4) and (5) respectively of Table 7 and the values in column (2) of that table.

Table 8 – Impacts of the future, random and event stresses

Type of liability	Impact of future stress ($)	Impact of random stress ($)	Impact of event stress ($)
Lifetime annuities	22,006		
YRT	17,749	10,992	27,834
RBNA – term	124		
IBNR – term	1,550		
TPD	12,695	5,542	6,948
RBNA – TPD	4,498		
IBNR – TPD	4,048		
Trauma	6,337	2,093	840
RBNA – trauma	226		
IBNR – trauma	790		
Level premium term	4,780	1,380	1,994
Income protection – active lives	27,276	617	3,226
Income protection – CICP	1,343		
Total	**103,422**	**20,624**	**40,841**

This information has been summarised in the following table to show the impact of each individual stress.

Table 9   – Summary of stress impacts

Type of stress	Impact of stress ($)
Mortality – future	24,203
Mortality – random	12,372
Mortality – event	29,827
Morbidity – future	57,213
Morbidity – random	8,251
Morbidity – event	11,014
Longevity	22,006
Total	**164,887**

7.2 Determining the diversification factor that applies for liabilities

APRA proposes that the diversification factor be derived by:

- applying an APRA-specified correlation matrix to the individual stress impacts to give a combined impact, after allowing for diversification; and

- taking the ratio of the combined impact, after allowing for diversification, to the sum of the individual stress impacts.

The APRA-specified correlation matrix is shown below.

Table 10 – Correlation matrix for determining diversification benefits

	Mortality – future (%)	Mortality – random (%)	Mortality – event (%)	Morbidity – future (%)	Morbidity – random (%)	Morbidity – event (%)	Longevity (%)
Mortality – future	100	0	0	50	0	0	-25
Mortality – random	0	100	0	0	0	0	0
Mortality – event	0	0	100	0	0	0	0
Morbidity – future	50	0	0	100	0	0	0
Morbidity – random	0	0	0	0	100	0	0
Morbidity – event	0	0	0	0	0	100	0
Longevity	-25	0	0	0	0	0	100

Example

Applying this correlation matrix to the impacts in Table 9 gives a combined impact, after allowing for diversification, of $81,816 or 49.6 per cent of the sum of the individual stress impacts. The diversification factor would be 49.6 per cent.

7.3 Modifying the diversification factor in certain circumstances

APRA proposes that, in determining the stressed liabilities, the margins that are applied to the best estimate mortality, morbidity and longevity assumptions be adjusted to recognise a diversification benefit.

In most circumstances, the margins would be adjusted by multiplying by the diversification factor. This is appropriate for assumptions like claims incidence, where the impact on the liability increases linearly with the margin.

In other cases, for example margins applying to the income protection claims termination assumption, the impact on the liability does not increase linearly with the margin. In these cases, APRA would require the Appointed Actuary to make modifications to give a suitable result.

For the QIS, APRA will provide a diversification factor conversion table that Appointed Actuaries can use to adjust the margin applying to the claims termination assumption. The table will give modified diversification factors corresponding to a range of actual diversification factors. Where the Actuary does not undertake internal analysis, the margin applying to the claims termination assumption would be adjusted by multiplying by the modified diversification factor.

The proposed conversion table is shown below. APRA expects that using the table would give a more conservative result than if internal analysis were undertaken.

Table 11 – Modified diversification factors for margins applying to claims termination assumptions

Diversification factor (%)	Modified diversification factor (applying to claims termination assumption) (%)
<=50	70
>50 to <=60	75
>60 to <=70	80
>70 to <=80	90
>80 to <=90	95
>90	100

The following example illustrates this point.

Example

Consider a 40 year old male professional with $6,000 per month of income protection cover that pays benefits to age 65. The policy waiting period is 30 days.

If he makes a claim, the expected claim cost using claim termination rates from the 1989 to 1993 insured Australian disability table, IAD 89-93, would be approximately $16,000.

If the actuary applied a 40 per cent margin to the claim termination assumption (i.e., claim termination rate of only 60 per cent of IAD 89-93) the claims cost would be approximately $46,000, an increase of $30,000 over the best estimate.

Applying a 50 per cent diversification factor to the margin gives an adjusted margin of 20 per cent (i.e., claim termination rate of 80 per cent of IAD 89-93). This gives a claims cost of approximately $26,000, an increase of only $10,000 over the best estimate.

To have an impact on the liability that is 50 per cent of the impact of applying a 40 per cent margin, the actuary would need to use an adjusted margin of 26 per cent (i.e., claim termination rate of 74 per cent of IAD 89-93). With a 26 per cent margin the claim cost would be approximately $31,000, an increase of $15,000 over the best estimate.

Applying the diversification factor conversion table would give an adjusted margin of 70 per cent x 40 per cent = 28 per cent (i.e., claim termination rate of 72 per cent of IAD 89-93) compared with only a 26 per cent margin resulting from internal analysis.

7.4 Applying the diversification factor to give adjusted margins

As described in section 7.3, APRA proposes that the margins applied to the best estimate mortality, morbidity and longevity assumptions would be adjusted to recognise a diversification benefit.

Where the impact on the liability increases linearly with the margin, the margin would be adjusted by multiplying by the diversification factor. In other circumstances, the margin would be adjusted by multiplying by a modified diversification factor.

Example

Table 12 shows the adjusted margins that result from applying the 49.6 per cent diversification factor to the margins provided as an example in Chapter 5. For the future claims termination assumption, a modified diversification factor of 70 per cent has been applied.

Table 12 – Assumed stresses post diversification

Type of liability	Future stress (%)	Random stress (%)	Event stress (%)
Individual YRT – future insured lives mortality	5.0	10.4	26.3
RBNA – term	1.0		
IBNR – term	5.0		
Individual TPD – future TPD incidence	14.9	20.3	25.8
RBNA – TPD	24.8		
IBNR – TPD	14.9		
Trauma – future trauma incidence	17.4	16.4	6.5
RBNA – trauma	14.9		
IBNR – trauma	17.4		
Individual level premium term – future insured lives mortality	5.0	15.9	22.8
Individual income protection – future claims incidence	19.8	4.0	21.8
Individual income protection – future claims termination	21.0		
RBNA – income protection	19.8		
IBNR – income protection	19.8		

7.5 Determining the stressed liabilities

The stressed liabilities would be determined by simultaneously applying:

- the APRA-specified lapse and expense stresses;

- the APRA-specified longevity stress, adjusted for diversification; and

- for mortality and morbidity, the adjusted margins for future, random and event stresses.

In applying the adjusted margins for future, random and event stresses in respect of mortality and morbidity:

- the margin in the next 12 months would be equal to the sum of the future, random and event stress margins, adjusted for diversification; and

- after 12 months only the future stress margin, adjusted for diversification, would be applied.

Subject to APRA's restrictions on the repricing assumption, the Appointed Actuary would be permitted to assume that management exercises discretions. The discretions would need to be appropriate to the combined diversified stress scenario.

Example

Table 13 shows stressed liabilities that have been determined by applying a combined diversified stress scenario:

- Column (1) represents the RFBEL.

- In column (2), the liabilities have been determined using stressed expense and lapse assumptions.

- The values in column (3) use stressed expense and lapse assumptions and the simultaneous diversified future, random and event stresses.

- Column (4) is the difference between columns (3) and (2). It represents the impact of the combined diversified mortality, morbidity and longevity stresses.

Table 13 – Impact of combined diversified stress

Type of liability	RFBEL ($)	RFBEL with expense and lapse stresses ($)	RFBEL with expense, lapse and combined diversified stresses ($)	Impact of combined diversified stresses ($)
	(1)	(2)	(3)	(4)
Lifetime annuities	78,811	78,888	87,337	8,449
YRT	(321,217)	(263,820)	(235,750)	28,070
RBNA – term	6,198	6,198	6,260	62
IBNR – term	15,495	15,495	16,264	769
TPD	(105,004)	(82,422)	(69,926)	12,496
RBNA – TPD	8,996	8,996	11,228	2,232
IBNR – TPD	13,493	13,493	15,502	2,009
Trauma	(38,197)	(31,261)	(26,660)	4,601
RBNA – trauma	753	753	865	112
IBNR – trauma	2,258	2,258	2,650	392
Level premium term	14,566	19,368	23,414	4,046
Income protection – active lives	(40,439)	(43,711)	(27,724)	15,987
Income protection – CICP	4,923	4,923	5,821	898
Total	**(359,364)**	**(270,842)**	**(190,719)**	**80,123**

The total impact of the combined diversified mortality, morbidity and longevity stresses is $80,123. This is very close to the value of $81,816 derived by applying the correlation matrix to the individual stresses.

7.6 Requirement to increase the stressed liability where short-term losses are assumed to be recovered by future price increases

APRA is proposing that, before the stressed liability is compared with the stressed termination value, a test be applied to ensure that the cash flows for the stressed liability do not exhibit losses in the short term followed by profits in the longer term. Where this is the case, the stressed liability would need to be determined as the present value of the losses.

Life insurance policies are multi-year contracts. Where stresses cause losses in the short term, an insurer may be able to increase premiums to restore the product to profitability over the longer term.

APRA does not consider it prudent for capital calculations to assume that losses in the short term will be recovered by profits in the longer term.

For a product group, if the stressed liability determined by applying the combined diversified stress scenario exhibits losses until the period at which the repricing takes effect, followed by profits thereafter, the stressed liability would be determined by capitalising the losses until the date of repricing. No benefit would be given for the profits beyond the date of repricing.

The product groupings that would be used in applying this test would be the same as those applied in determining the capital base.

This is illustrated in the example below.

Example

Table 14 shows the best estimate premium income, claim payments and expenses for a product with positive net cash flow.

Table 14 – Best estimate cash flows for a product with positive net cash flow

Year	Premium income ($)	Claim payments ($)	Expenses ($)	Net cash flow ($)
1	100	(60)	(25)	15
2	100	(60)	(25)	15
3	100	(60)	(25)	15
4	100	(60)	(25)	15
5	100	(60)	(25)	15
6	100	(60)	(25)	15
7	100	(60)	(25)	15

Applying a 40 per cent stress to the claim payments would result in the product moving to a negative net cash flow position, as shown in Table 15.

Table 15 – Cash flows if a 40 per cent margin is applied to claim payments

Year	Premium income ($)	Claim payments ($)	Expenses ($)	Net cash flow ($)
1	100	(84)	(25)	(9)
2	100	(84)	(25)	(9)
3	100	(84)	(25)	(9)
4	100	(84)	(25)	(9)
5	100	(84)	(25)	(9)
6	100	(84)	(25)	(9)
7	100	(84)	(25)	(9)

It would take a 24 per cent premium increase to restore product profitability. Table 16 shows the cash flows assuming repricing from year 4 onwards. The product now has negative net cash flow in the first three years and positive net cash flow thereafter.

Table 16 – Cash flows assuming repricing at the end of year three

Year	Premium income ($)	Claim payments ($)	Expenses ($)	Net cash flow ($)
1	100	(84)	(25)	(9)
2	100	(84)	(25)	(9)
3	100	(84)	(25)	(9)
4	124	(84)	(25)	15
5	124	(84)	(25)	15
6	124	(84)	(25)	15
7	124	(84)	(25)	15

APRA is proposing that the stressed liability be determined by taking the present value of the cash outflow of $9 in each of the first three years. The value of the cash inflows of $15 per annum after year 3 would not be permitted to be assumed to reduce the stressed liability.

Chapter 8 – Insurance risk capital charge

Once the Appointed Actuary has determined the stressed liabilities and stressed termination values, it would be possible to determine the prudent liability. APRA proposes that the prudent liability be determined as the greater of the stressed liability and stressed termination value.

This test would be applied to groups of products. The product groupings would be the same as those applied in determining the capital base. These must not be broader than the APRA product groups.

APRA proposes that the insurance risk capital charge be derived by aggregating across the product groups the excess, if any, of the prudent liability over the adjusted liability.

Example

Table 17 calculates the prudent liability and insurance risk capital charge for the statutory fund used as an example in this technical paper.

Table 17 – Example of calculation of insurance risk capital charge

APRA product group	RFBEL ($)	BETV ($)	Adjusted liability ($)	Stressed liability ($)	Stressed TV ($)	Prudent liability ($)	Insurance risk capital charge ($)
L3	78,811	0	78,811	87,337	0	87,337	8,526
L4 stepped	(417,225)	47,193	47,193	(279,567)	57,753	57,753	10,560
L4 level	14,566	0	14,566	23,414	0	23,414	8,848
L5 stepped	(35,516)	4,923	4,923	(21,903)	7,604	7,604	2,681
Total	**(359,364)**	**52,116**	**145,493**	**(190,719)**	**65,357**	**176,108**	**30,615**

For APRA product groups L3 and L4 level, the insurance risk capital charge is based on the difference between the stressed liability value and the RFBEL.

For APRA product groups L4 stepped and L5 stepped, the insurance risk capital charge is based on the difference between the stressed termination value and the BETV.

Appendix A – Components of a general insurer's capital base

General insurers, like ADIs, have a prudential standard that defines the amounts that are eligible to be included in the capital base.

The highest quality capital components, Tier 1 capital, comprise:

- fundamental Tier 1 capital: effectively paid-up ordinary share capital and retained earnings;

- non-innovative residual Tier 1 capital: perpetual non-cumulative preference shares with no step-up in dividends; and

- innovative residual Tier 1 capital: perpetual non-cumulative preference shares with a step-up in dividends permitted in some circumstances.

Tier 2 capital includes other components that, while they are of lower quality, contribute to an insurer's ability to meet policyholder claims. Tier 2 capital comprises:

- upper Tier 2 capital: perpetual cumulative preference shares and perpetual subordinated debt; and

- lower Tier 2 capital: term subordinated debt.

The capital base is defined as the sum of Tier 1 and Tier 2 capital, after specified deductions and adjustments and subject to various limits.

For general insurers, the deductions include:

- intangible assets;

- deferred tax assets net of deferred tax liabilities; and

- surpluses in defined benefit superannuation funds.

The current limits for general insurers are broadly that:

- fundamental Tier 1 capital must constitute at least 75 per cent of net Tier 1 capital;

- Tier 2 capital is limited to a maximum of 100 per cent of net Tier 1 capital; and

- lower Tier 2 capital is limited to a maximum of 50 per cent of net Tier 1 capital.

The existing limits in *Circular to Life Insurance Companies Investment Issues No E.1 Subordinated Debt* that apply to the quantum of approved subordinated debt that can be recognised within statutory funds are similar to the limits applying to ADIs and general insurers in respect of Tier 2 capital.

The following diagram represents a general insurer's balance sheet, with assets on the left hand side and liabilities and capital on the right hand side. In this diagram, fundamental Tier 1 capital has been shown at the current minimum limit of 75 per cent of net Tier 1 capital. Lower Tier 2 capital has been shown at the current maximum limit of 50 per cent of net Tier 1 capital and total Tier 2 capital has been shown at the current maximum 100 per cent limit.

The final outcome of the BCBS review is likely to be a reduction in the quantum of Tier 2 capital permitted to be included as eligible capital, and an increase in the required quality of eligible capital.

Figure 4 – Balance sheet and identification of capital base for a general insurer under existing capital standards
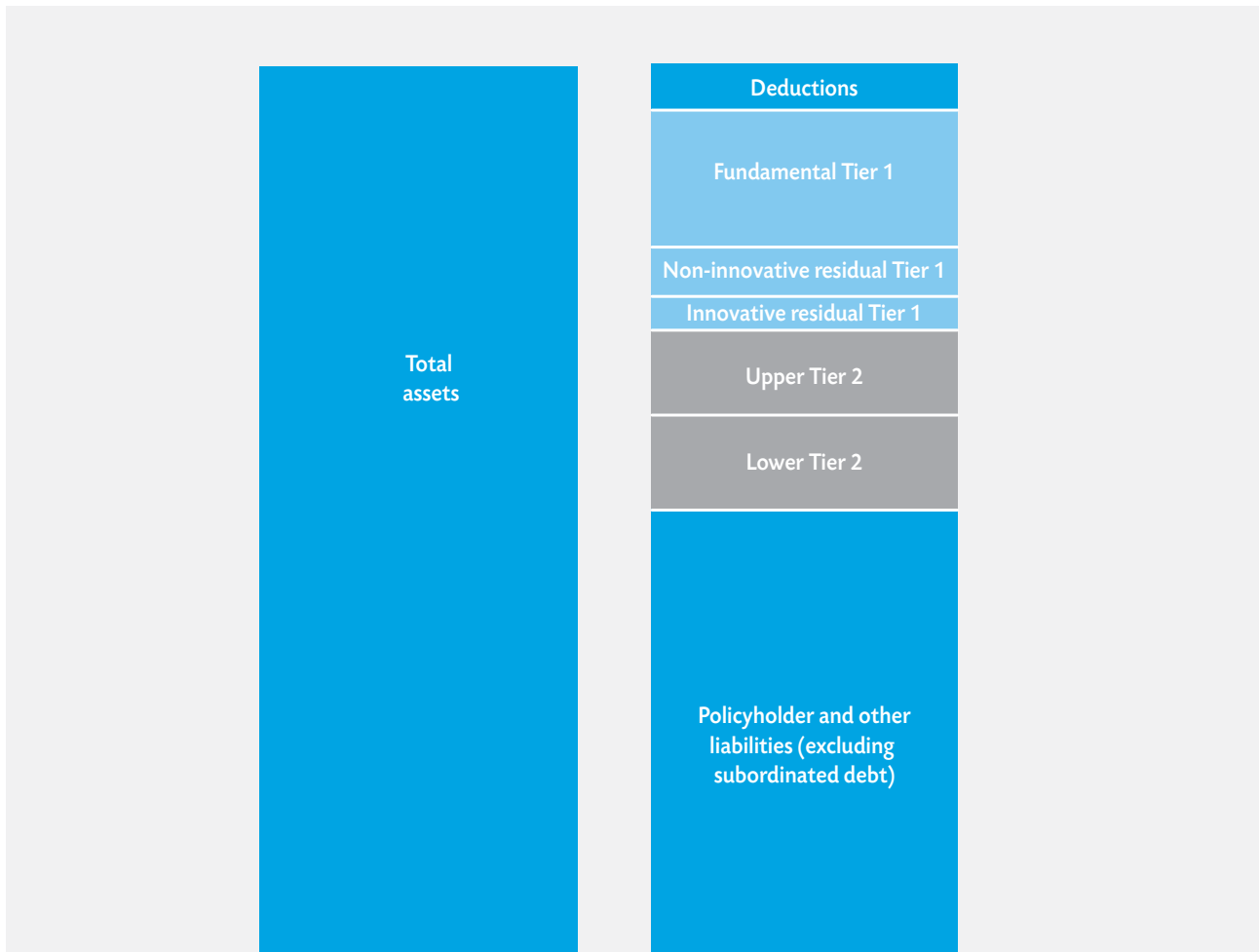
Appendix B – Existing solvency and capital adequacy standards

Under the existing standards, Appointed Actuaries are required to determine both a Solvency Requirement and a Capital Adequacy Requirement for each statutory fund. Total assets of the statutory fund are compared with both the Solvency Requirement and the Capital Adequacy Requirement. All amounts are determined on a gross of reinsurance basis.

The Solvency Requirement is a measure of the assets needed to meet liabilities to policyholders and other creditors in the event that the statutory fund is closed to new business. It allows for adverse experience, with the intention that the fund be able to withstand a combination of adverse events that would be expected to arise once every 200 years.

The Capital Adequacy Requirement is a measure of the assets needed so that the statutory fund can continue into the future accepting new business and meeting liabilities to policyholders and other creditors. It allows for adverse experience, with the intention that the fund be able to withstand a combination of adverse events that would be expected to arise once every 400 years.

In determining the requirements, policies are separated by Related Product Group (RPG). An RPG is a grouping of products that are considered by the Appointed Actuary to exhibit characteristics and pricing structures sufficiently similar as to justify grouping for the purposes of profit reporting.

The Solvency Requirement for a statutory fund is calculated as follows:

(a) For each RPG, determine the total Solvency Liability: this is the present value of the future claims and expenses less the present value of future premiums using minimum prescribed assumptions.

(b) For each RPG, determine the total Minimum Termination Value: this is the minimum amount that the insurer is obliged to pay in the event of voluntary termination by the policyholder. For risk business it includes the present value of claims in course of payment, reserves for reported but not admitted claims and incurred but not reported claims and reserves for unexpired risks or refunds of premium. Amounts determined as a present value of future payments must be determined using assumptions consistent with the Solvency Standard (i.e., stressed assumptions).

(c) For each RPG, take the greater of the Solvency Liability and Minimum Termination Value and aggregate across the statutory fund.

(d) Add an Expense Reserve in respect of costs that may be incurred in the statutory fund should it be placed into run-off. The expense reserve is determined in accordance with a prescribed formula. For a friendly society, the expense reserve is held in the general fund, not in the statutory fund.

(e) Apply a minimum of the total Current Termination Values for the statutory fund: these are the termination values payable by the insurer in the event of voluntary termination, assuming that the insurer does not exercise any rights to reduce payments. If the total Current Termination Values for the statutory fund are less than the sum of the Expense Reserve and the greater of the Solvency Liability and Minimum Termination Value for each RPG, then no amount will be added at this step.

(f) Add the amount of non-policy liabilities, excluding amounts of approved subordinated debt.

(g) Add an Inadmissible Asset Reserve, so that certain assets, for example unsecured loans to directors, are unavailable to back other components of the Solvency Requirement. Reserves for asset concentration risk are included in this step.

(h) Add a Resilience Reserve, so that the statutory fund is able to withstand prescribed market stresses to the values of its assets and liabilities.

The Capital Adequacy Requirement is calculated in a similar way but incorporates a New Business Reserve instead of an Expense Reserve. The calculation is:

(a) For each RPG, determine the total Capital Adequacy Liability: this is the present value of the future claims and expenses less the present value of future premiums, using best estimate assumptions plus a margin chosen by the Appointed Actuary from a prescribed range.

(b) For each RPG, determine the total Current Termination Value: this is the amount payable by the insurer in the event of voluntary termination by the policyholder. For risk business it includes the present value of claims in course of payment, reserves for reported but not admitted claims and incurred but not reported claims and reserves for unexpired risks or refunds of premium.

(c) For each RPG, take the greater of the Capital Adequacy Liability and Current Termination Value and aggregate across the statutory fund.

(d) Add the amount of non policy liabilities, excluding amounts of approved subordinated debt.

(e) Add an Inadmissible Asset Reserve, so that certain assets are treated as unavailable to meet other components of the Capital Adequacy Requirement. Reserves for asset concentration risk are included in this step.

(f) Add a Resilience Reserve, so that the statutory fund is able to withstand prescribed market stresses to the values of its assets and liabilities. The stresses are more severe than the corresponding stresses under the Solvency Requirement.

(g) Apply a minimum of the Solvency Requirement for the statutory fund.

(h) Add a New Business Reserve, determined so that the fund can continue to meet the Solvency Requirement over the following three years, allowing for realistic projections of new business. For a friendly society, the new business reserve is held in the general fund, not in the statutory fund.

The following paragraphs describe how the Solvency Liability and the Capital Adequacy Liability are determined.

Determining stressed liabilities under the existing standards

Under the existing standards the stressed liabilities, the Solvency Liability and the Capital Adequacy Liability, are calculated by simultaneously stressing assumptions for mortality, morbidity, expenses and lapses. Cash flows are discounted at the rate used for discounting policy liabilities, subject to a maximum of the mid swap rate.

All future cash flows (claims, expenses and premiums) are included. The stressed liability can be negative.

The stressed assumptions are typically either:

1. best estimate plus a margin chosen by the Appointed Actuary from a prescribed range (capital adequacy); or

2. prescribed by APRA (e.g., prescribed factor times prescribed table) (solvency).

All the stresses are assumed to be permanent. There is no explicit allowance for short term volatility or extreme events (e.g., pandemic).

The stressed assumptions include implicit allowance for diversification. Any allowance for operational risk is implicit in the prescribed assumptions (e.g., the investment linked risk margin).

The actuary may assume the exercise of discretions, for example, increasing future premium rates or reducing future bonus rates.

There is no explicit requirement to consider the timing of the cash flows and hold additional reserves where losses in the short term are expected to be recovered by profits in the longer term.

Appendix C – Stresses proposed for Solvency II

APRA's proposed approach for determining 99.5 per cent probability of sufficiency liabilities have been influenced by the life underwriting and health[12] underwriting risk modules that form part of the SCR standard formula calculation under the Solvency II proposals. These modules require insurers to apply separate stresses at a 99.5 per cent probability of sufficiency and combine them with a correlation matrix.

The table below sets out the stresses that apply for the fifth Quantitative Impact Study (QIS5) in the technical specifications issued in July 2010.

Table 18 – Solvency II stresses for QIS5

Item	Stress
Mortality stress	A (permanent) 15 per cent increase in mortality rates for each age
Longevity stress	A (permanent) 20 per cent decrease in mortality rates for each age
Disability stress	Increase of 35 per cent in disability rates for the next year, together with a (permanent) 25 per cent increase (over best estimate) in disability rates at each age in following years; Plus, where applicable, a permanent decrease of 20 per cent in morbidity/disability recovery rates
Lapse stress	The worst of three scenarios: Increase by 50 per cent (life) or 20 per cent (health) in the assumed rates of lapse in all future years for policies where the surrender strain is expected to be positive. Reduction of 50 per cent (life) or 20 per cent (health) in the assumed rates of lapse in all future years for policies where the surrender strain is expected to be negative. Mass lapse of 30 per cent (retail policies) or 70 per cent (non-retail policies) of all policies where the surrender strain is positive
Expense stress	Increase of 10 per cent in future expenses compared to best estimate anticipations, and increase by 1 per cent per annum of the expense inflation rate compared to anticipations
Mortality catastrophe stress	An absolute 1.5 per thousand increase in the rate of policyholders dying over the following year. This margin is primarily based on the potential impact of a flu pandemic, but with some implicit additional allowance for other risks, including other types of pandemic, terrorism and natural catastrophes.
Health (disability) catastrophe stress	Considers three scenarios: • **Arena disaster** – QIS5 specifies the number of people affected and how they are affected (death, short term disability, long term disability, permanent disability, not affected, not insured). Insurers have to estimate their exposure to the disaster, given their market share for the types of policies that would be affected. • **Concentration scenario** – QIS5 specifies the proportion of lives affected and how they are affected. Insurers have to apply these proportions to their largest known concentration of lives in a group scheme. • **Pandemic scenario** – a 0.075 per thousand increase in the rate of policy owners becoming permanently disabled due to an outbreak of a disease such as encephalitis lethargica.

12 Policies covering disability risks are considered to be health insurance for QIS5.

Appendix D – Framework for assessing risk margins for balance sheet liabilities of Australian general insurers

Under *Prudential Standard GPS 310 Audit and Actuarial Reporting and Valuation* (GPS 310), general insurance liabilities are determined by adding risk margins to the central estimates of the outstanding claims liabilities and premiums liabilities. The risk margin is the component of the insurance liabilities that relates to the uncertainty in the central estimate of the liabilities.

GPS 310 requires that risk margins be determined, for each class of business and in total, on a basis that reflects the individual circumstances of the general insurer and its portfolios. In any event, the risk margins need to be such that the insurance liabilities, after any diversification benefit, are not less than 'the greater of a value that is:

- determined on a basis that is intended to value the insurance liabilities of the general insurer at a 75 per cent level of sufficiency; and

- the central estimate plus one half of a standard deviation above the mean for the insurance liabilities of the general insurer.'

It has taken several years for APRA's risk margin requirements to be bedded down and for a generally accepted practice to emerge for quantification of risk margins.

The requirements have achieved a broadly consistent industry approach to uncertainties in the estimates of insurance liabilities and have also provided a pragmatic, but reasonable, basis for the application of insurance risk capital charges.

In November 2008, the (general insurance) Risk Margins Taskforce of the IAAust prepared a draft paper, *A Framework for Assessing Risk Margins*, that sought to propose a comprehensive framework for assessing insurance liability risk margins, and to provide practical advice on how to implement the framework.

Under the framework proposed by the Risk Margins Taskforce, separate margins are determined for each major product group and source of uncertainty. The paper categorises uncertainty into components arising due to independent risk, internal systemic risk and external system risk. The table below provides a brief description of each of these risks.

Table 19 – Types of risk that give rise to uncertainty in central estimates of general insurance liabilities

Type of risk	Description
Independent risk	Refers to the uncertainty due to random variation. It has two components: • The **random component of process** risk which is the uncertainty that arises because of future random variation (volatility) around the true underlying mean. • The **random component of parameter risk** which is the uncertainty that arises because the assumptions are based on past experience that was itself subject to random variation.
Internal systemic risk	Refers to the uncertainty that arises because of imperfections in the model from which the assumption is derived. It has three sources: • **Specification error** that arises because of the simplifications made in specifying the model. • **Parameter selection error** that arises because it isn't possible to adequately measure certain parameters required for the model. • **Data error** that arises because of lack of availability or poor quality of the data required by the model.
External systemic risk	Refers to uncertainty that is external to the actuarial modelling process, for example economic, social and political risks.

Under the framework described by the Risk Margins Taskforce, Australian general insurers determine both an explicit correlation matrix and risk margins at a 75 per cent probability of sufficiency, with no allowance for diversification. The correlation matrix is applied to the pre-diversification margins, to give margins that have been adjusted for the benefits of diversification. These post-diversification margins, are applied to give liabilities at an overall 75 per cent probability of sufficiency level.

The approach that APRA is proposing life insurers would use in determining stressed liabilities at a 99.5 per cent probability of sufficiency is an adaptation of the Risk Margins Taskforce's proposed framework for assessing general insurance liability risk margins.

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