Information Paper

Asset Risk Charge

March 2013

About this paper

Prudential Standard GPS 114 Capital Adequacy: Asset Risk Charge (GPS 114) and *Prudential Standard LPS 114 Capital Adequacy: Asset Risk Charge* (LPS 114) set out APRA's requirements in relation to asset risk. This Information Paper assists general insurers, Level 2 insurance groups and life companies including friendly societies (collectively referred to as 'insurers') in calculating the Asset Risk Charge. It explains the rationale for each of the seven stress tests and the aggregation formula. It also includes advice on practical aspects of the calculations.

This Information Paper is relevant to all insurers unless otherwise specified.

Contents

Asset Risk Charge

GPS 114 and LPS 114 require an insurer to maintain adequate capital against the asset risks associated with its activities. Asset risks can be derived from a number of sources including credit risks and market risks. These risks affect assets and liabilities, including both on- and off-balance sheet exposures. The size of the Asset Risk Charge reflects the degree to which an insurer's risk appetite and investment policy allow a mismatch between assets and liabilities.

The Asset Risk Charge tests the impact of a range of stresses on the balance sheet of an insurer. Such stresses may be directly applied to asset values or to economic factors which in turn affect the value of both assets and liabilities and off-balance sheet exposures. The Asset Risk Charge is calculated by aggregating falls in the capital base due to the application of seven separate stress tests. Each stress is calibrated at a 99.5 per cent probability of sufficiency over a 12-month period. The aggregation formula recognises that the probability of all seven stresses occurring at the same time is very remote.

An example of how an insurer might calculate each of the stresses and the overall Asset Risk Charge is set out in the Attachment.

Real interest rates stress

This stress measures the impact on the capital base of changes to real interest rates. All assets and liabilities whose value depends on real interest rates are affected. For example, the affected assets include all fixed interest assets. All liabilities valued using a discount rate are also affected.

Yields on fixed interest assets can be split into a risk-free interest rate and an allowance for credit risk (known as the credit spread). Risk-free interest rates are used to discount insurance liabilities. Changes in risk-free rates therefore affect the values of both the fixed interest assets and the insurance liabilities on an insurer's balance sheet.

Nominal risk-free interest rates can be considered as comprising two separate components: an expected Consumer Price Index (CPI) inflation rate and a real interest rate. The Asset Risk Charge considers real interest rates and expected inflation separately to allow for asset and liability mismatches in terms of both the timing of cash flows and whether or not those cash flows are affected by inflation. Some asset and liability cash flows are affected by inflation and others are not. If stresses were applied to nominal yields only (real interest rates plus expected inflation rates), the Asset Risk Charge would only reflect mismatches in the timing of cash flows.

The upward stress for real interest rates is greater than the downward stress. Based on historical experience, APRA expects an upward movement of a given amount to be more likely than a downward movement of the same magnitude.

Floating rate assets are not materially affected by the real interest rates stress (or the expected inflation stress). The interest rate paid on the asset can be assumed to move up or down in line with the stresses from the next interest rate reset date and, therefore, the fair value of the asset will not be materially affected.

Expected inflation stress

This stress measures the impact on the capital base of changes to expected CPI inflation rates. Both assets and liabilities may be affected.

The expected inflation stress is specified as an increase or decrease in expected CPI inflation. There is no minimum for the decreased CPI inflation rate. It is possible for expected CPI inflation (post-stress) to be less than zero; however, nominal risk-free interest rates (post-stress) cannot be assumed to fall below zero.

The projected cash flows for some types of insurance liabilities may be subject to price inflation in the broad economy (as measured by the CPI) and superimposed inflation (where claims are expected to inflate at a faster rate than CPI). If superimposed inflation is anticipated, GPS 114 and LPS 114 require the total inflation rate to increase or decrease by the same amount as the change to expected CPI inflation.

If all of the cash flows of an asset or liability are affected by inflation, the value of the asset or liability will not change as a result of applying the expected inflation stress. The change in the cash flows will be offset by the change in the discount rate used to value the cash flows. APRA expects an insurer to identify its fixed interest assets and insurance liabilities that have cash flows not subject to inflation. The value of these assets and liabilities must be recalculated when applying the expected inflation stresses (as required by GPS 114 and LPS 114).

The risk margins for general insurance liabilities include an allowance for the uncertainty that the valuation will differ from the central estimate due to the impact of inflation (refer to *Prudential Standard GPS 320 Actuarial and Related Matters* (GPS 320)). The Insurance Risk Charge is calculated by multiplying the insurance liabilities (including risk margins) by insurance risk capital factors. APRA has minimised the potential for double-counting of inflation risk within both the Insurance Risk Charge and Asset Risk Charge by reducing the insurance risk capital factors for the insurance liabilities for Category C classes of business. Prior to 1 January 2013, these factors were higher as the determination of the relevant investment capital charge in the previous version of GPS 114 did not include any allowance for inflation risk.

The Asset Risk Charge only considers CPI inflation. For general insurers, GPS 320 requires the insurance liabilities to include an allowance for superimposed inflation risks, such as medical and legal cost inflation. The Insurance Risk Charge is calculated by applying a factor to the insurance liabilities. The Insurance Risk Charge also therefore includes an implicit allowance for superimposed inflation risk.

If the assets held by an insurer are non-indexed bonds and the liability cash flows are subject to inflation, the risk charge component for the increase in expected inflation will become smaller as the duration of the bonds is shortened towards zero (the assets are affected by this stress, but not the liabilities). This reduction will be partly offset by an increase in the risk charge component for falling real interest rates (due to the duration mismatch between assets and liabilities). Note, however, that exposure to both risks creates a diversification benefit via the aggregation formula as the risk charge components are not simply added together.

Currency stress

This stress measures the impact on the capital base of changes in foreign currency exchange rates. These changes may affect the values of both assets and liabilities when measured in Australian dollars. The two currency stress scenarios are an increase and a decrease of 25 per cent in the value of the Australian dollar against all foreign currencies.

GPS 114 and LPS 114 mandate that an increase in the capital base arising from a movement of the Australian dollar against one foreign currency cannot be used as an offset to reductions in the capital base arising from the movement of the Australian dollar against other foreign currencies. APRA notes that the greatest loss for an insurer exposed to multiple currencies may occur when foreign currencies move in different directions against the Australian dollar and against each other. APRA has specified two scenarios with no allowance for offsets as a simplified means of addressing this risk. To compensate for any potential excess conservatism implicit in this method, the adverse movement in exchange rates has been set at a relatively modest level of 25 per cent.

The Asset Risk Charge may make inadequate allowance for currency risk in some circumstances. For example, the risk charge component for currency risk would be zero if the assets backing the liabilities were denominated in the currencies of the liabilities and the assets backing the capital base were denominated in Australian dollars. Yet clearly there would be a currency risk if losses occur at the same time that the Australian dollar depreciates. APRA expects an insurer to consider interactions between currency and other risks as part of its Internal Capital Adequacy Assessment Process (ICAAP).

The impact on assets and liabilities denominated in foreign currencies of a 25 per cent increase in the value of the Australian dollar can be found using the formula: stressed value = fair value divided by 1.25 (or fair value multiplied by 0.8). Note that multiplying the fair value by 0.75 will give an incorrect result.

Similarly, for the scenario of a decrease in the value of the Australian dollar the formula is: stressed value = fair value divided by 0.75 (or fair value multiplied by 1.333).

Equity and property stresses

These stresses measure the impact on the capital base of a fall in the value of equity and property assets. The stresses are specified as increases in the ASX 200 dividend yield and actual rental yields, respectively. The stresses can be converted to falls in asset values using the following formulae:

- fall in value = fair value * (1 - d/d'); or

- stressed value = fair value * d/d';

where d is the actual dividend or rental yield at the reporting date and d' is the stressed dividend or rental yield.

For example, if the actual dividend yield is 4 per cent, the stressed dividend yield for listed equities will be 6.5 per cent and the fall in value will be 1 – 4 per cent/6.5 per cent, or 38.5 per cent.

This method of applying the stresses results in a larger fall in value when yields are low and a smaller fall in value when yields are high. It reduces the pro-cyclical nature of the Asset Risk Charge by increasing the Charge following a rise in equity or property markets and reducing it following market falls.

The stress for unlisted equities is higher than for listed equities. Unlisted equities tend to have higher risk and less liquidity. In extreme circumstances, the realisable value of unlisted equities may fall further than listed equities.

The stress applied to unlisted equities also applies to any assets that are not considered in any of the other stress tests – e.g. precious metals, commodities, works of art and plant and equipment.

The equity stress test includes an increase to equity volatility. Forward-looking volatility is a key valuation parameter for financial options and some other types of derivatives. Volatility is important in determining the value of options due to the asymmetric nature of option payoffs (in many potential outcomes an option will have zero value when it expires). For some types of options, the increase in volatility will increase the value of the option and reduce the risk charge component for the equity stress.

The property stress also applies to infrastructure assets, with the stress applied to the earnings yield instead of the rental yield. APRA has specified that this method be used because infrastructure assets are similar in nature to property assets.

For owner-occupied property, the imputed rental yield must be estimated by reference to current rental yields on similar properties.

Credit spreads stress

This stress measures the impact on the capital base of an increase in credit spreads and the risk of default. The stress is applied to interest-bearing assets, including cash deposits and floating-rate assets. Credit derivatives and zero-coupon instruments such as bank bills are also included.

A credit spread is the difference in yield between an asset that is subject to credit risk and a similar risk-free asset. Credit spreads can vary significantly over time, both for individual securities and for securities markets. In the credit spreads stress, the value of interest-bearing assets is reduced via specified increases in the prevailing yields on these assets. In addition to the risk of an increase in credit spreads for the particular counterparty grade, the stresses also allow for the risk of default or downgrading of the asset to a lower credit rating over the following 12 months.

The higher factors for securitised and re-securitised assets reflect the complexity of these assets and the difficulties associated with rating and assessing their inherent risk.

A full year's default factor must be applied to each asset affected by the credit spreads stress, even if the asset will mature shortly after the reporting date or can be redeemed at any time without penalty or notice. The Asset Risk Charge provides for adverse experience that may occur over the following 12 months. Assets that mature within the 12 months may need to be reinvested. Therefore, all assets affected by the credit spreads stress must be assumed to be at risk of default for a full 12-month period.

The credit spreads stress factors vary by counterparty grade. The counterparty grade must be determined using ratings for the particular asset. Issuer ratings should not be used. For assets guaranteed by an Australian state or territory government, the counterparty grade used can be the grade immediately higher. For example, for these assets with a counterparty grade 2, the credit spread stress would be counterparty grade 1 (other).

Default stress

This stress allows for the risk of default of counterparties to particular assets. The default stress is applied to a range of counterparty exposures including reinsurance assets, reinsurance recoverables, deferred reinsurance expense[1], over-the-counter derivatives and other receivables. It does not apply to exchange-traded derivatives. The default factors are applied to the fair value of over-the-counter derivatives, the central estimate of reinsurance assets for general insurers, and the difference between gross and net adjusted policy liabilities for life companies. The default stress is also applied to unpaid premiums, unclosed business and certain unsecured loans, where set percentages are applied to these exposures.

The default of reinsurance assets and recoverables is more likely after insurance stresses have occurred. Similarly, the default of other counterparties, such as the suppliers of over-the-counter derivatives, is more likely after other types of asset stresses have occurred. In these circumstances, the potential losses from the default of counterparties can be much greater than allowed for in the calculation of the default stress. APRA expects an insurer to assess its potential post-stress default risk exposures to reinsurers and other counterparties in its ICAAP.

The default factors for the default stress are higher than for the credit spreads stress. This recognises that exposures to individual counterparties for the default stress can be significantly greater than for the credit spreads stress. In particular, insurers are normally only exposed to a small number of reinsurers, but the individual exposures can potentially be relatively large. In contrast, APRA would expect bond portfolios to be well-diversified with each individual counterparty exposure being relatively small.

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1 For general insurers, the application of the default stress to deferred reinsurance expense is used as a proxy for expected reinsurance recoveries on premiums liabilities. For further information on the use of this proxy, see: http://www.apra.gov.au/GI/ReportingFramework/Pages/proposed-changes-to-general-insurance-prudential-reporting-june-2010.aspx.

Aggregation formula

The aggregation formula recognises that the probability of all seven stresses occurring at the same time is very remote. The correlations between the different asset risks reflect the likelihood of the different stresses occurring at the same time. The real interest rates, expected inflation and currency stresses apply in two directions. The aggregated risk charge component depends on the signs of the stresses. If the signs of stresses x and y are opposite, the correlation between the stresses is adjusted to become zero and the aggregated risk charge component will be smaller than if the signs of the stresses were the same.

For example, a depreciation of the Australian dollar against all foreign currencies has the same sign and is therefore positively correlated with the equity, property and credit spreads stresses. However, a rise in the Australian dollar is uncorrelated with these other stresses. Lower correlations result in a lower Asset Risk Charge. Negative correlations have not been allowed, in order to limit the degree to which diversification benefits can be recognised. Correlations between extreme events are difficult to determine with confidence as there is limited relevant historical data from which to derive them. APRA has therefore taken a conservative approach in allowing recognition of diversification benefits.

For the real interest rates, expected inflation and currency stresses, normally only one direction of stress will produce a risk charge component greater than zero. However, it is possible for the risk charge components to be greater than zero in both directions if the assets or liabilities include financial derivatives or options. For the currency stress, a positive risk charge component in both directions can also occur if an insurer has assets and liabilities denominated in multiple foreign currencies. If a stress test produces non-zero risk charge components in both directions, it is possible that the smaller risk charge component could produce the larger aggregation. The aggregation formula must therefore be calculated separately for each different combination of non-zero risk charge components. It is not correct to simply perform the aggregation once using the larger of the risk charge components.

Example of the aggregation calculation

An insurer has calculated the risk charge components for the seven stress tests. The results are shown in the following table:

	RIR	INF	CUR	EQY	PROP	CSP	DEF
up	0	0	100	200	100	100	40
down	300	250	50				

The first three stress tests have been performed with stresses in both directions (up and down). The remaining four stress tests are performed in one direction only and the results are shown on the 'up' line.

The aggregation of the risk charge components must be performed twice because the currency stress has a non-zero risk charge component in both directions.

For the first aggregation, the inputs are:

	RIR	INF	CUR	EQY	PROP	CSP	DEF
amount	300	250	100	200	100	100	40
sign	1	1	-1	1	1	1	n/a

For the first three stress tests the 'sign' is 1 for the 'down' stress and -1 for the 'up' stress. For the equity, property and credit spreads stress tests the sign is always 1. For the default stress test the sign is not used in the aggregation formula.

The results from cross-multiplying the risk charge components for the stress tests (excluding default) with the correlation factors and the 'sign' functions, and then taking the greater of zero are shown in the table below.

	RIR	INF	CUR	EQY	PROP	CSP
RIR	90,000	15,000	0	12,000	6,000	6,000
INF	15,000	62,500	0	20,000	10,000	5,000
CUR	0	0	10,000	0	0	0
EQY	12,000	20,000	0	40,000	8,000	16,000
PROP	6,000	10,000	0	8,000	10,000	4,000
CSP	6,000	5,000	0	16,000	4,000	10,000

Cross-multiplication is not used for aggregating the risk charge component for the default stress test.

The aggregation is found by adding the numbers in this table (426,500), taking the square root (653), and then adding the default charge (693).

For the second aggregation, the inputs are:

	RIR	INF	CUR	EQY	PROP	CSP	DEF
amount	300	250	50	200	100	100	40
sign	1	1	1	1	1	1	

The cross-multiplication is:

	RIR	INF	CUR	EQY	PROP	CSP
RIR	90,000	15,000	3,000	12,000	6,000	6,000
INF	15,000	62,500	2,500	20,000	10,000	5,000
CUR	3,000	2,500	2,500	6,000	1,000	2,000
EQY	12,000	20,000	6,000	40,000	8,000	16,000
PROP	6,000	10,000	1,000	8,000	10,000	4,000
CSP	6,000	5,000	2,000	16,000	4,000	10,000

The difference between this aggregation and the first aggregation is that the number at the intersection of the currency row and column is smaller, but all the other numbers in the currency rows and columns are now non-zero.

The resulting aggregation is 709. This is greater than the result from the first aggregation, even though the risk charge component for the currency stress is smaller.

Tax

For life companies, any tax benefits that would arise as a result of applying the asset risk stresses are assumed to be realisable for the purpose of determining the Asset Risk Charge. The combined stress scenario (refer to Attachment B of *Prudential Standard LPS 110 Capital Adequacy* (LPS 110)) is used to calculate an adjustment that must be made to the prescribed capital amount when the capital charges are aggregated. This adjustment includes an allowance for any tax benefits that cannot be offset against deferred tax liabilities.

For general insurers, there is no combined stress scenario adjustment. Instead, the tax benefits arising in the asset risk scenarios can only be recognised to the extent that tax legislation allows them to be absorbed by the existing deferred tax liabilities that remain after netting off the deferred tax assets and liabilities in the calculation of deductions from Common Equity Tier 1 Capital.

An insurer that belongs to a tax consolidation group may not recognise tax benefits whose value is contingent on them being used by other entities within the tax consolidation group.

Examples of recognition of tax benefits for general insurance

After netting deferred tax assets and deferred tax liabilities for the purpose of calculating regulatory adjustments to its capital base, a general insurer has a deferred tax liability remaining that is solely in respect of unrealised capital gains on its Australian equity assets. In the equity stress test, tax benefits will arise as the result of the fall in the values of these assets. These tax benefits can be recognised in the Asset Risk Charge as the tax benefits will reduce existing deferred tax liabilities for the same assets.

The same insurer also has Australian fixed interest assets. In the upward real interest rates and expected inflation stress tests and in the credit spreads stress test, tax benefits will arise as the result of the falls in asset values. These tax benefits can only be recognised if taxation legislation allows current tax assets arising from losses in the value of fixed interest assets to be offset against current tax liabilities arising from capital gains on equity assets.

Look-through

For assets held under a trust or in a controlled investment entity, an insurer may generally choose to calculate the Asset Risk Charge by looking-through to the assets and liabilities of the trust or entity. Alternatively, the investment may be treated as an equity asset (a listed equity asset if the investment is listed, and an unlisted equity asset if the investment is unlisted). GPS 114 and LPS 114 require look-through to be used if the trust or controlled investment entity is both unlisted and geared.

For this purpose, a trust or controlled investment entity is geared if it has explicit borrowings or if the investments of the trust or controlled investment entity include assets such as options that are themselves implicitly geared.

The purpose of looking-through is to assess more accurately how an asset's value will change in each of the stress scenarios. For example, without look-through a cash management trust would be treated the same as an unlisted equity, which would clearly be inappropriate.

APRA expects an insurer to have a reasonably good understanding of how its investments in trusts and controlled investment entities will behave in each of the asset risk stress scenarios. It would not be good practice to invest in assets without understanding or monitoring all material risk exposures.

The materiality provisions of *Prudential Standard GPS 110 Capital Adequacy* (GPS 110) and LPS 110 allow approximations to be used in calculating the Asset Risk Charge providing the results are not likely to be misleading. If asset allocations are reasonably stable, these approximations might include using recent, rather than up-to-date, look-through information for investments in trusts. An insurer might also potentially be able to use benchmark, rather than actual, asset allocations for a trust if the boundaries for asset allocations are reasonably narrow. For larger investments, the investment manager could be asked to provide sensitivities or details of the asset and liability exposures on a regular basis, to enable the Asset Risk Charge to be accurately calculated.

Look-through can only be used for a controlled entity that undertakes activities other than investing if APRA has approved the inclusion of the entity within the insurer's Extended Licensed Entity (as defined in GPS 114 and LPS 114).

Convertible preference shares

A convertible preference share (CPS) is a 'hybrid' that provides a defined income stream initially, but can convert to an ordinary share at a later date. The dividend payments can also be stopped by the issuer in some circumstances. For the Asset Risk Charge under GPS 114 and LPS 114, hybrid assets must be split into their interest-bearing and equity/option exposures. An insurer must consider the changes in value of the two exposures separately for each of the asset risk stresses.

It may not be feasible to split a CPS if there is no single fixed date on which conversion is certain to occur. In this circumstance a split is not necessary; however, the change in value of the CPS (as a whole) must be assessed under each of the real interest rates, expected inflation, equity and credit spreads stresses. This requires complex modelling that assesses the probability of conversion at each possible conversion date, and the remaining value of the CPS if conversion does or does not occur. For the equity stress, the value of the CPS would need to be determined assuming that the shares of the issuer fell in value by the prescribed amount and volatility increased. If an insurer is unable to carry out such complex modelling a CPS should be treated as an ordinary share (either listed or unlisted as appropriate).

Off-balance sheet exposures

An insurer may enter into transactions that are presently not recognised as assets or liabilities on the balance sheet but which give rise to contingencies and commitments. Such off-balance sheet items may have a significant bearing on the level of risk to which the insurer is exposed. These items may add to other risks, or they may reduce other risks, for example by hedging assets or liabilities on the balance sheet.

Off-balance sheet exposures include all contingent assets and contingent liabilities, regardless of whether or not their disclosure is required under *Australian Accounting Standard AASB 137 Provisions, Contingent Liability and Contingent Assets* (AASB 137).

AASB 137 defines a contingent asset to be a possible asset arising as a result of past events, whose existence will be confirmed only by the occurrence or non-occurrence of one or more uncertain future events not wholly within the control of the insurer. The inflow of economic benefits is not virtually certain.

A contingent liability is defined to be a present or possible obligation, arising as a result of past events, whose existence will be confirmed only by the occurrence or non-occurrence of one or more uncertain future events not wholly within the control of the insurer. The obligation will probably not require an outflow of resources.

In order to calculate the Asset Risk Charge, changes to the balance sheet in each stress test must include the impact of off-balance sheet exposures, to the extent that these exposures will affect the post-stress balance sheet.

An example of a contingent liability is the issue of a credit guarantee where the normal assessment of the insurer is that it is unlikely to have to pay an amount under the instrument. For the purpose of calculating the impact of the default stress, the insurer must assume it will have to make some payments.

Fair value

GPS 114 requires the asset risk stress tests to be applied to the fair values of the assets of both general insurers and Level 2 insurance groups. For assets that have not been reported at fair value in the statutory accounts, the fair value must be estimated according to the framework for measuring fair value set out in *Australian Accounting Standard AASB 13 Fair Value Measurement.*

For life companies, a fair value adjustment to assets must be made as part of the regulatory adjustments to the capital base. The asset risk stress tests are applied to the fair value of assets.

Stressed value of interest-bearing assets

For interest-bearing assets that are traded in active markets, fair value at the reporting date is likely to have been determined from quoted prices. The stressed value of such an asset after application of the asset risk stress tests can be determined as follows:

- find the effective interest rate that exactly discounts the future cash receipts through the life of the asset to the fair value of the asset at the reporting date;

- the stressed value of the asset in the real interest rates and expected inflation stress tests can be found by increasing or decreasing the effective interest rate in line with the specified changes in real interest rates and expected inflation; and

- for the credit spreads stress test, the stressed value of the asset must be determined by adding the spread specified in the standard to the effective interest rate and then multiplying the reduced value of the asset by (1 − default factor), as specified in the prudential standard.

Stressed value of derivative assets

For exchange traded derivatives, fair value at the reporting date is likely to have been determined from quoted prices in active markets. The impact of each stress test on the fair value of the derivatives can be determined by using a derivative pricing model to calculate the impact of changes to interest rates, volatility and the price of the underlying assets. It can be assumed that the fair value of the asset will move in line with changes to the theoretical price derived from the pricing model.

The value of a derivative may be affected by several of the stresses. These include the real interest rates and expected inflation stresses, the equity stress (which includes volatility) and the default stress (for over-the-counter derivatives).

If derivatives are used for hedging purposes, they can reduce the impact of the asset risk stresses. An increase in the fair value of a derivative can offset a reduction in the fair value of other types of assets.

Other risks

The stresses applied in the calculation of the Asset Risk Charge only cover the types of asset risks to which an insurer is most likely to have material exposures. APRA expects an insurer to consider whether there are any other material asset risk exposures and to address these risks in the ICAAP.

Examples of exposures to other risks include:

- changes in the shape and slope of the yield curve; and

- derivatives whose value is sensitive to interest rate volatility or currency volatility.

Approximations

The materiality provisions of GPS 110 and LPS 110 allow approximate methods to be used to calculate the Asset Risk Charge.

These methods might include, for example:

- using the modified durations of assets and liabilities instead of more detailed cash flow projections to calculate the risk charge components for the real interest rates, expected inflation and credit spreads stresses;

- assuming the value of an investment in a cash management trust is unaffected by the real interest rates and expected inflation stresses; and

- not doing full projections of participating life insurance liabilities for stresses where the value of the existing guaranteed benefits is unchanged – instead, an approximate split of future profits between policy owners and shareholders might be used.

APRA expects an insurer to be able to demonstrate that its use of approximations is not likely to be misleading.

Who does the calculations?

It may be necessary for an insurer to ask its Appointed Actuary or investment managers to calculate the stressed values of insurance liabilities and more complex assets such as fixed interest assets and derivatives. Alternatively, advice could be obtained from these professionals as to a suitable methodology to use. It is acceptable to use reasonable estimates when preparing information that will not be audited.

In order to complete the calculations in a timely manner, sensitivity analyses performed at a date prior to the reporting date may be used, subject to materiality.

Attachment: Example of calculation of the Asset Risk Charge

This example of the calculation of the Asset Risk Charge could be either for a general insurance company, or for a life company statutory fund that has no policy benefits contractually linked to the value of assets. As a simplification, the calculations have been done without any allowance for tax benefits and there are no regulatory adjustments to the capital base.

For the real interest rates stress, expected inflation stress and credit spreads stress, the stresses have been applied using a simplified method based on the durations of the assets and liabilities. This method is approximate and in practice, revaluation of the asset and liability cash flows may be necessary.

Assets	$m	
Government bonds	1,000	Commonwealth government, duration 5 years
Corporate bonds	500	Counterparty grade 2, duration 5 years
Bank deposits at call	200	Counterparty grade 1
Listed equities	100	Current ASX200 dividend yield 3.5%
Properties	100	Current rental yield 6%
Reinsurance	100	Counterparty grade 2, APRA-authorised reinsurer
Total assets	**2,000**	
Liabilities		
Insurance liabilities	1,500	Duration 6 years. All liability cash flows subject to inflation risk
Other liabilities	100	Payable immediately
Total liabilities	**1,600**	
Capital base	**400**	

All assets and liabilities are denominated in Australian currency, except for 100 of the insurance liabilities which are denominated in New Zealand dollars.

The nominal risk-free interest rate is 5 per cent for all terms to maturity.

Real interest rates stress

The stresses in this module affect the government and corporate bond assets and the insurance liabilities.

The downward stress adjustment is 5% x 0.2 = 1%. The stressed nominal risk-free interest rate is 4%.

The increase in asset values is 1500 x 1% x 5 = 75 (using the duration of 5 years).

The increase in insurance liabilities is 1500 x 1% x 6 = 90 (using the duration of 6 years).

The risk charge component for the downward stress equals the reduction in the capital base of 15.

The risk charge component for the upward stress is zero.

Expected inflation stress

The stresses in this module affect the government and corporate bond assets. Insurance liabilities are not affected as the effect of changing the rate of inflation of the liability cash flows is offset by the change in the discount rate.

As only assets are affected, the risk charge component for the downward stress is zero.

The upward stress adjustment is 1.25%. The stressed nominal risk-free interest rate is 6.25%.

The decrease in asset values is 1500 x 1.25% x 5 = 93.75 (using the duration of 5 years).

The risk charge component for the upward stress equals the reduction in the capital base of 93.75.

Currency stress

The only currency exposure is to insurance liabilities (denominated in New Zealand dollars), so the adverse scenario is a decrease in the value of the Australian dollar relative to foreign currencies. The risk charge component for an increase in the value of the Australian dollar is zero.

The risk charge component for the scenario of a decrease in the value of the Australian dollar is 100 x 33.3% = 33.30.

Equity stress

The equities are listed, so the increase in the dividend yield is 2.5%. The stressed dividend yield is 3.5% + 2.5% = 6%.

The fall in value is 100 x (1 − 3.5% / 6%) = 41.67.

The risk charge component for the equity stress is 41.67.

Property stress

The stressed rental yield is 6% + 2.75% = 8.75%.

The fall in value is 100 x (1 − 6% / 8.75%) = 31.43.

The risk charge component for the property stress is 31.43.

Credit spreads stress

For Commonwealth government bonds the credit spreads stress is zero.

For corporate bonds with a counterparty grade of 2, the default factor is 0.6% and the spread factor is 0.8%. The stressed value of the bonds is 500 x (1 − 0.6%) x (1 − 0.8% x 5) = 477.12 (using the duration of 5 years).

The fall in value of the corporate bonds is 22.88.

For at-call bank deposits with a counterparty grade of 1, the default factor is 0.2%. The spread factor does not apply to at-call deposits. The fall in value of the bank deposits under the credit spreads stress is 200 x 0.2% = 0.40.

The risk charge component for the credit spreads stress is 22.88 + 0.40 = 23.28.

Default stress

The default stress applies to the reinsurance assets. The default factor for an asset with a counterparty grade of 2 is 2%. The risk charge component for the default stress is 100 x 2% = 2.

Aggregation calculation

The risk charge components for the stress tests are summarised in the following table:

	RIR	INF	CUR	EQY	PROP	CSP	DEF
amount	15.00	93.75	33.30	41.67	31.43	23.28	2.00
sign	1	-1	1	1	1	1	n/a

The sign for the real interest rates stress is 1 as the scenario is a decrease in rates. For the expected inflation stress the sign is -1 as the scenario is an increase in rates. For the currency stress the sign is 1 as the scenario is a depreciation of the Australian dollar. The sign for the equity, property and credit spread stresses is always 1. The sign is not used for the default stress.

The results from cross-multiplying the risk charge components for the stress tests (excluding default) with the correlation factors and the 'sign' functions, and then applying a minimum of zero are shown in the table below.

	RIR	INF	CUR	EQY	PROP	CSP
RIR	225	0	100	125	94	70
INF	0	8,789	0	0	0	0
CUR	100	0	1,109	833	209	310
EQY	125	0	833	1,736	524	776
PROP	94	0	209	524	988	293
CSP	70	0	310	776	293	542

The aggregation is found by adding the unrounded numbers in this table (20,056), taking the square root (141.62), and then adding the default charge (143.62).

Asset Risk Charge

The resulting Asset Risk Charge is 143.62.