# 8. Smoothing And Guarantees

## 8.1 Objectives and Market Context

With-profits business has historically been, and is still, a significant part of the UK's medium and long-term savings market. The Sandler Review recognised this and in particular the roles that with-profits can play in:

- Allowing investors to have a significant exposure to the equity market, while smoothing some part of the volatile investment returns from that asset class; and
- Providing guarantees, of varying degrees of significance, over and above the smoothing inherent in the policy design.

Further, there is some interest within the market in investigating how these two features, but particularly the former, can remain available in the Stakeholder suite of products and to consider whether guarantees can be delivered separately from the concept of smoothing.

For these reasons the objectives as set out in Section 2 concluded with the following 'This should include an analysis of charging options for the smoothing element of the with-profits product. There should also be some analysis of potential charging models for a "guaranteed" product.'

These features are separate and distinct and have been considered so within this Section of this Report.

As described in Section 3, this Report does not consider alternative product designs for Stakeholder products and in addition the FSA is already considering some aspects of with-profits design through Discussion Paper 20, Issues for with-profits business arising from the Sandler Review. Other changes are expected through the introduction of the Principles and Practices of Financial Management ("PPFM") and changes in the corporate governance of with-profits business set out in Consultation Paper 167, With-profits governance, the role of actuaries in life insurers, and certification of insurance returns, from the FSA. The work in this Report is therefore limited to the strict objectives set out by HM Treasury, and has not considered other aspects of the ongoing debate over with-profits business. The next sub-section describes the methodology used.

In recent years the traditional with-profits structure has come under criticism, both informed and otherwise. The industry has responded with alternative fund structures that incorporate many of the features set out in the Review. In particular several explicit methods of applying smoothing have been created (although in nearly all cases the companies have also retained the right to apply market value adjusters ("MVA") to protect the fund against a group of policyholders taking advantage of smoothing to the detriment of others).

It is also important to recognise the role that other financial services products, other than with-profits funds, can and are playing in making available guarantees of various kinds. In particular several organisations have sold significant volumes of "guaranteed equity bonds". The traditional structure of such products has been combinations of a deposit account and various structures of options. Returns are typically expressed as being a percentage of the increase of a certain index, for example the FTSE 100, with a guarantee of a refund of initial deposit under certain circumstances. Despite their popularity these products are not considered in the analysis since while they are a useful product to have in a competitive financial services market, they are unlikely to play a significant role in tackling the Government objectives (as set out in the Sandler Review and the HM Treasury Consultancy Document) of significantly increasing savings amongst the target market through a combination of reduced regulatory burden on the sales process

coupled with controls on product features and charges. More recent developments include unitised funds offered by specialist banks that aim to provide a smoothed, increasing unit price – using hedging and other investment techniques. Such funds are likely to be increasingly popular as the techniques gain wider acceptance. We have not considered these funds explicitly in this report although our approach to calculating the economic cost of smoothing and guarantees is applicable whatever the underlying method used to achieve the smoothing or to fund the guarantee. At present a feature of such funds is the lack of transparency in setting out explicit charges for the smoothing and guarantee features.

## *8.2 Methodology - economic*

The nature of, and hence any "fair" charge for, both smoothing and guarantees are critically dependent on future investment returns. To model these features effectively it is necessary to make use of stochastic modelling techniques. Instead of making a single best estimate assumption of future returns, a stochastic asset model is used to generate possible future scenarios. Profits and/or losses generated by smoothing can be obtained for each scenario and the 'smoothing reserve' tracked. In the case of a guaranteed product, a distribution of guarantee costs can be obtained.

A new breed of stochastic model has been used to take this process one step further. Instead of simply projecting the smoothing profits / losses and guarantee costs that would emerge in each generated investment scenario, market consistent valuation enables stochastic results to be discounted to generate 'economic values'. This enables results from many scenarios to be presented efficiently in a single number. This method has also been used as a basis of deriving charges for the work on smoothing and on guarantees.

This work focuses on 'Economic Values'. It is not possible to pre-judge the capital requirements that may be in place when the product is launched, principally because at the date of preparing this report there are considerable uncertainties as to the eventual prudential supervision of all financial services products, and in particular those with smoothing or guarantee features.

The 'economic value' of a cash flow or quantity can be interpreted as its value calculated with reference to the quoted market values of traded assets. The methodology enables a distribution of future cash flows emerging at a series of points of time in the future to be summarised into a single 'present' or 'economic' value. Economic value suggests a 'fair' price to pay for a given set of cash flows. The method takes into account the time value of money and allows for risk. It is important to recognise that the range of future investment scenarios are myriad and it is not possible to predict what will actually happen in the future. However, given what is known about current market conditions, an economic value puts a value on a range of possible but uncertain outcomes. It is only as actual experience emerges that it is possible to tell whether a particular Stakeholder has actually benefited from smoothing or guarantees.

A simple example may help to illustrate this. Suppose a provider offers a product that guarantees a return of contribution in one year's time. A consumer makes a payment of £100. The economic value of this guarantee is calculated as £5. Over the year the assets backing the contract fall by 20% to £80. In the absence of the guarantee the consumer would expect their investment to be worth £80, however, they are actually paid £100. The £20 shortfall must be met from somewhere – perhaps the shareholders of the company would provide the capital to meet the shortfall. At the start of the contract, the 'economic' or 'fair' value of the guarantee was calculated to be £5 based on information available at the time and before the actual course of events was known. If investment performance had been good the £5 paid would not have directly led to the policyholder receiving any additional benefit. However, as a result of the fall in asset values the policyholder did benefit from the protection that the guarantee offered and the shareholder must fund the £20 shortfall.

Our stochastic scenarios have been produced using our proprietary economic model, The Smith Model. The overall conclusions are not expected to be materially different if other, economically sound models have been calibrated in the same way.

Our main runs have been carried out under the following set of economic assumptions:

Table 8.1

| | |
|---|---|
| Mean of future equity returns | 8.1% |
| Mean of future bond returns | 4.5% |
| Percentage of fund in equities | 60% |
| Volatility of equity returns (being the volatility of the UK stock market over the last 10 years) | 17% |

For the work on guarantees the sensitivity of the results to an equity volatility of 25% has been considered.

## *8.3 Methodology – product and expenses*

Our work, for both smoothing and guarantees, is based on a simple "open-ended" savings contract.

For simplicity the tax regime is assumed to be "tax on profits" so there is no tax on investment returns (and no recovery of the tax credits on dividends). The conclusions would not be materially different in terms of structure if a taxed fund had been used.

The additional capital requirements on insurance companies offering products with smoothing and guarantees has been ignored (including the requirement for such capital would increase the calculated charges).

It has been assumed that the basic contract has a 1% annual management charge that is deducted from the unit fund, in line with the original price-cap proposed by Sandler. No profit or loss is assumed to arise from this charge for expenses.

No allowance has been made for the possible inclusion of any death benefits, and mortality has been ignored.

For the work on smoothing an allowance for exits at each year in the projection has been made at a rate of 3% pa.

## 8.4 Smoothing

### 8.4.1 Purpose and simple example

The purpose of smoothing is to offer policyholders some protection against the full volatility of asset values. Market peaks and troughs are 'smoothed' to provide more stable payouts.

A rule currently popular amongst providers offering 'smoothed' products is to credit policy values with half the difference between the actual investment return and an 'expected long term rate'. This is typically done through a "unitised with-profits" vehicle. The policy receives units in return for contributions or contributions, and the value of these units is adjusted in accordance with the specified smoothing formula. On exit the policyholder receives the then value of the units, although the provider normally retains the right to apply a MVA if necessary (for example if the nominal value of the units being encashed is significantly in excess of the market value of the underlying assets, and a large number of policies are withdrawing).

To illustrate this rule, consider an example. Suppose there is a single premium policy of £1,000. Charges are ignored to keep things simple. The 'expected long term rate' is set to be 7%, i.e. greater than the "risk free" rate on gilts. Over the first year the assets backing the product lose 5% of their value. The assets backing the policy are now worth £950. The smoothed investment return used to increase the value of the policy is 1% (being the average of the assumed long term rate of 7% and the actual return of –5%) meaning that the 'smoothed' policy value is £1010. If the policy were to be surrendered at this point the policyholder would benefit from smoothing and be protected from the 5% fall in asset values, assuming no MVA is applied i.e. that smoothing is indeed maintained.

In the next year, the market bounces back and the fund grows by 30%. The assets backing the policy are now worth £1,235. The smoothed investment return is 18.5% (again being the simple average of the assumed 7% and the actual 30% ) taking the smoothed policy value to £1,197. Now the smoothing would work slightly against the policyholder. If they withdrew they would get slightly less than the value of the assets backing the policy.

Table 8.2

| | Year 1 | Year 2 |
|---|---|---|
| Investment return | -5% | +30% |
| Smoothed investment return | +1% | +18.5% |
| 'Pure' asset value | £950 | £1,235 |
| 'Smoothed' asset value | £1,010 | £1,197 |

In reality smoothing is made more complex through the effects of different contributions being paid at different times, and through various possible ways of funding for the possible shortfalls that can occur. For example, at the end of Year 1 if the figures represented the total fund then if the policy was to withdraw either an MVA would need to be applied to prevent a loss (in effect negating the smoothing) or funds from elsewhere (other policyholder funds or shareholders, or from realising any purchased options) would be needed to finance the actual shortfall.

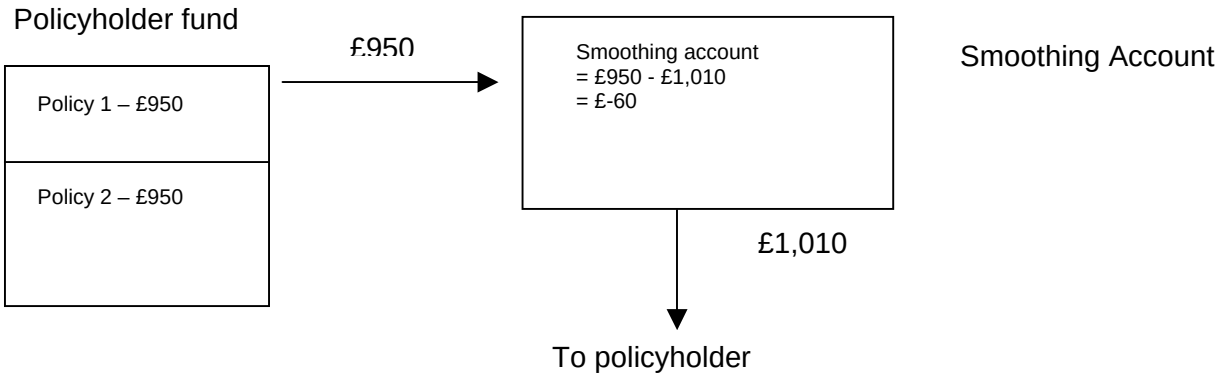
### *8.4.2 Managing and charging for smoothing*

Sandler proposed to manage smoothing using what was termed a smoothing account. The smoothing account finances any smoothing losses and benefits from smoothing profits. The operation of the smoothing account can be illustrated using a continuation of the above example. Assume that there are two identical policies in-force at the start of year 1. The policyholder fund is then £2,000. Also, suppose that there is a smoothing reserve with a nil initial balance.

At the end of the first year, one of the policies withdraws. The policyholder is paid £1,010. What then happens to the smoothing account?

Figure 8.1

Year 1 - smoothing loss = £60 (£1,010 - £950):

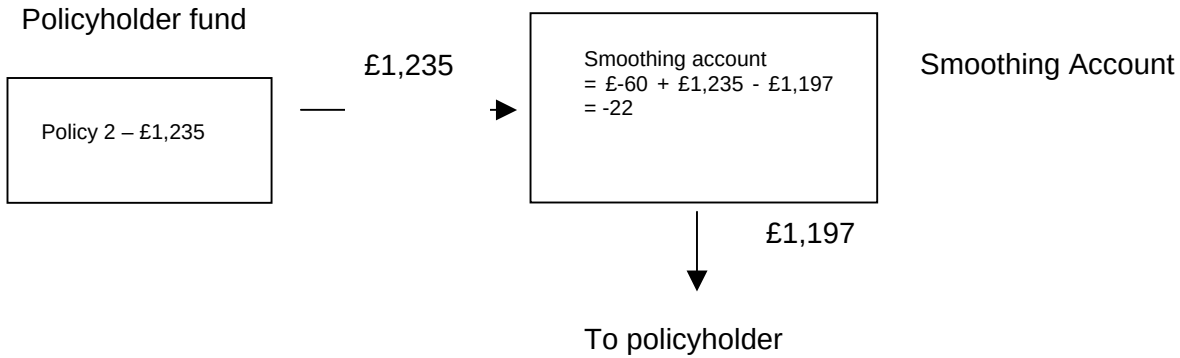



In practice this loss of £60 will need to be financed from some source, as discussed in detail later in this section.

Now assume that the second policy withdraws at the end of year 2.

Figure 8.2

Year 2 – smoothing profit = £38 (£1,235 - £1,197)




When the policyholder payout (i.e. smoothed asset value) is greater than the pure asset value, the smoothing account must meet the short fall. In the reverse situation, the smoothing account benefits from the smoothing profit. Hence in the former circumstance there is a true cost to maintaining the smoothing policy – in practice many insurers retain the right to waive the normal smoothing rules and apply a MVA so as to remove this cost in certain circumstances. In the past, and particularly for traditional with-profits policies including single premium bonds, there has been some discretion as to exactly when and how an insurer imposes a MVA. It is likely that the proposed Principles and Practices of Financial Management ("PPFM") being introduced by the FSA will clarify this aspect for traditional with-profits business. If an insurer can retain the right to impose an MVA then there is less requirement to make large explicit charges for smoothing as there is less potential recourse to additional capital. This indicates the need to consider together the smoothing mechanism including the detailed management of the smoothing account, any charges for smoothing, and the possible use of MVAs.

Further costs could arise from smoothing as a result of the prudential regime for insurance companies that can require additional capital to be set aside over and above that strictly necessary on economic grounds. However for the purposes of this section only the pure "economic" cost arising from the need to fund any shortfalls has been considered.

One of the features of an explicit smoothing account suggested by the Sandler Review was for the account to be managed in such a way that its expected long-term balance is zero. The following stochastic projections illustrate whether this is achievable without the application of MVAs, which in some cases could be significant.

### 8.4.3 Funding the costs of smoothing

There are two basic options for the 'funding' of the smoothing account:

1. The smoothing account is ring-fenced within policyholder funds. This means that smoothing deficits are funded by policyholders as a group. Smoothing profits are passed back to policyholders. In this instance, there is little need for explicit smoothing charges to be made to parties outside the policyholders' funds as the cost of smoothing (and indeed any smoothing profits) are absorbed by other policyholders' funds. The question here becomes one of assessing the impact of smoothing on different groups or cohorts of policyholders.
2. The smoothing account forms part of shareholder funds or perhaps the inherited estate of an existing with-profits fund. An explicit charge would be made for smoothing.

Current consensus within the industry seems to favour the first of these options. A major reason for this viewpoint is that under the second of these options there is a danger of conflicts of interest between shareholders and policyholders. With a specific, upfront charge shareholders could be interested in minimising the cost of the smoothing, leading to artificial constraints on the investment strategy of the fund. Although competition on investment returns could limit this impact it should be noted that the FSA are currently consulting on changes in the way that past performance on investments can be used in marketing. The impact of investment volatility on the cost of smoothing is illustrated later in this section. This illustrates the need to explain the smoothing operation to policyholders in a transparent way and to explain the impact that smoothing will have had on an investor's returns.

For the first option, it is not always obvious on an economic basis whether a regular charge defined in advance should be made for smoothing. For a given smoothing rule and set of parameters whether a charge is needed or not will depend on economic conditions. It may be that for a particular rule and set of parameters the economic value of smoothing is negative, i.e. that there is no economic benefit to policyholders from the smoothing mechanism. A number of existing products apply a variation of the first option. In these cases, a proportion of smoothing profits / losses are fed back into smoothed policy values and the rest is dealt with through the smoothing account. It should however be recognised that even with this structure a group of policyholders other than those who benefit from the smoothing would have to stand behind the smoothing to get it off the ground and to fund any shortfall (if MVAs are not to be applied or are to be applied only in limited circumstances).

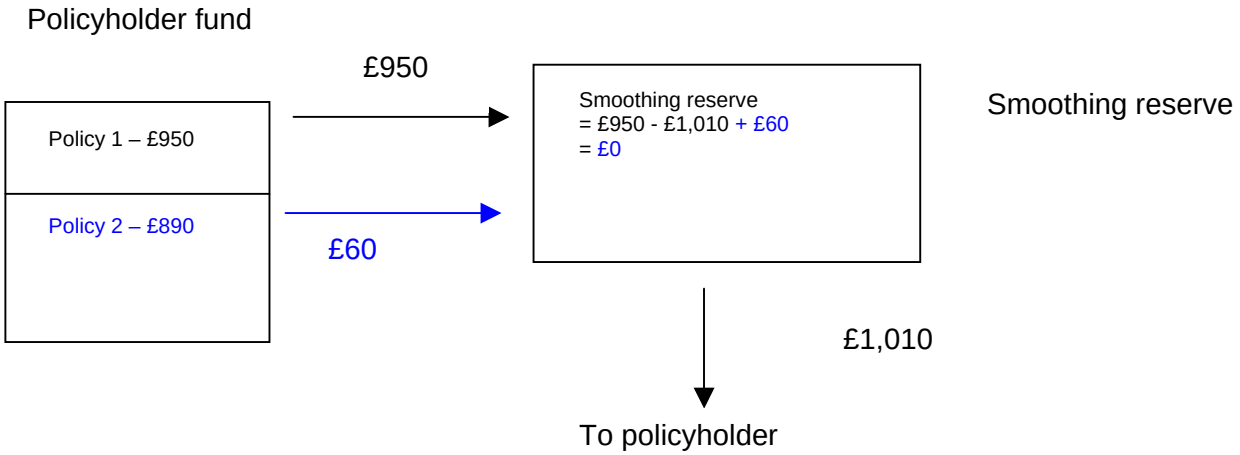
In addition to the question of whether shareholders or policyholders should finance the cost of smoothing it is important to consider alternative methods of charging for the cost. As can be seen from the simple example above, and from the more detailed modelling set out later in this section, the charge varies with the underlying investment returns and their volatility. Hence, in theory, different charges would be needed on each premium or contribution according to the investment environment at the time of payment. That would create a complex structure.

An alternative to an explicit charge at the start of the contract, based on the expected need to call on capital, would be to establish guidelines for remunerating capital as and when it was used. What would be needed is for the specific rules on smoothing (those used by the individual company or industry standards established either as part of the Stakeholder suite of products or as part of the wider review into with-profits business) to specify exactly how such support would be used and its eventual cost if used. This could form part of the particular "PPFM" for Stakeholder products. Changes to the mechanisms could be made as experience unfolds, with changes to the PPFM being allowed in a similar fashion as for the more general PPFM being introduced by the FSA.

The first method of funding smoothing can be illustrated using a simple example. As before, policy one decides to withdraw at the end of the year and policy 2 stays within the fund. Policy one is paid £1,010 despite the assets backing the policy being worth £950. The extra £60 is funded by the

policyholder fund – in effect by policy two. A transfer of £60 is made from the policyholder fund into the smoothing account. The policy value of policy 2 is reduced to £890 but the smoothing reserve is unchanged. Here the smoothing account simply acts as a buffer.

Figure 8.3




The result of this method is that policyholders meet the cost of smoothing as a group. The impact of smoothing on an individual policyholder's payout will depend on the smoothing profits and losses that have emerged in the past. The approach can work reasonably well when the flow of monies in and out the fund is relatively stable. In an expanding fund the impact on the continuing of the cost or benefit from past smoothing will be dampened. Conversely, in a contracting fund, the impact on the continuing policies from the smoothing profits or losses would be exaggerated. In a rapidly declining fund the problem could become critical leading to a tontine or noose effect.

### 8.4.4 Smoothing – detailed methodology

The above comments can be illustrated using stochastic modelling. The following smoothing rule is used:

Smoothed investment return = half the difference between the actual investment return and an 'expected long term rate'.

In addition, an alternative where smoothed investment return is equal to the average of the last 3 years' actual investment returns has been investigated. The specific details will vary for any particular smoothing rule but the general conclusions still stand.

Within the model it is assumed that smoothing will continue to be applied at all times in the future even though in reality the company may reserve the right to stop applying the smoothing rule in particular market conditions i.e. to apply an MVA under certain circumstances set out in the PPFM. Hence the results show the total economic value of smoothing to policyholders. The cost of this can then be met in various ways including a combination of an explicit charge on all policies or retaining smoothing profits and losses within the policyholder fund with the use of an MVA. The results shown assume that none of the cost is met by using an MVA.

Calculations have been carried out under a number of alternatives as to investment mix, smoothing rules and in particular on the percentage of smoothing profits and losses that are retained within the policyholder fund.

Two types of outputs are provided – projected distributions of the smoothing account and economic values. For the examples where an explicit smoothing charge is considered a charge has been derived (which has been taken as a percentage of the fund although there are examples in the market where a premium related charge is levied), so that the economic value of the charges equals the economic value of the need for capital support.

The development of the smoothing account has been considered both for a cohort of policies paying a single premium, and for a single cohort paying regular premiums (the overall analysis would be similar if various cohorts of business joining at different times were considered).

In each case the smoothing account is started with a nil balance, and grows in line with the returns on cash.

The smoothed policy value is accumulated in accordance with the smoothing rule and the investment performance in each period of the simulation, with a deduction not only for the assumed 1% basic fund charge but also, where relevant, with the calculated "smoothing charge" that is needed in the particular case being examined.

### 8.4.5 Smoothing – detailed results

All results are shown for a single cohort and, unless otherwise stated, are based on the smoothing rule where smoothed investment return is calculated as the average of the actual investment return and an "expected rate". No allowance for any anti-selection by customers has been included.

### *8.4.6 Single premium*

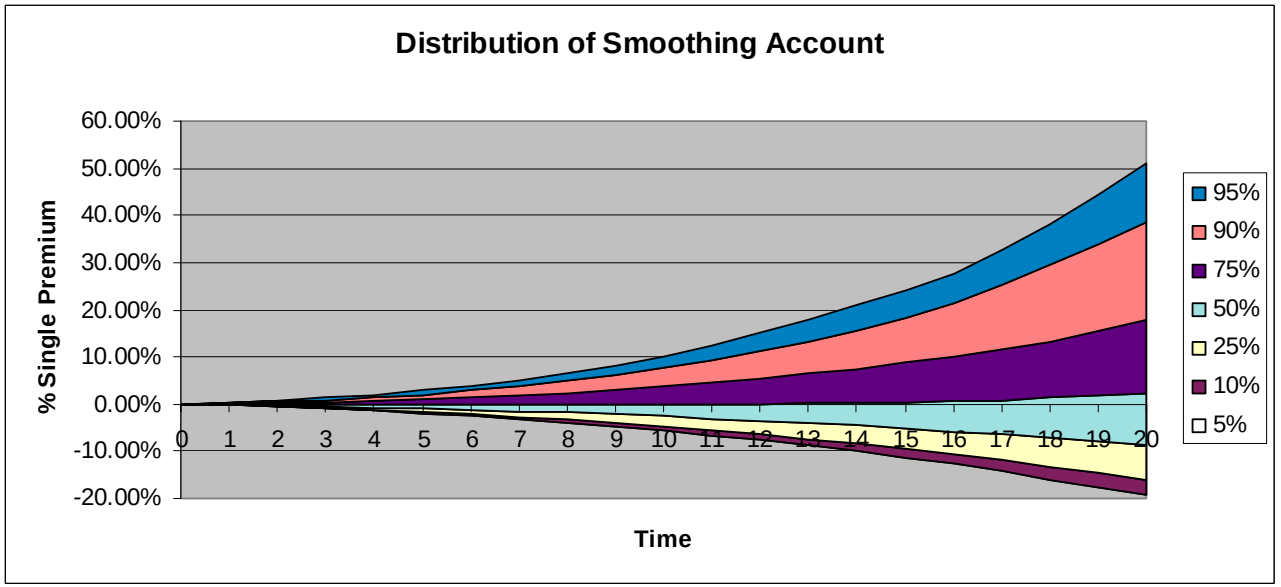
This section investigates the behaviour of the smoothing account under a variety of different assumptions for the smoothing rules and economic scenarios. Figures are based on a single premium contract and all amounts are expressed as a percentage of the single premium.

***Central assumptions***

The graph below shows the distribution of smoothing account percentiles over time. Each percentile band shows the proportion of times that values fall within that band. (So in the Chart below, 95% of the smoothing account values at each time fall below the upper limit of the area shaded in blue. The area in blue shows the values that lie between the 90$^{th}$ and 95$^{th}$ percentile).

In this example smoothed investment returns have been calculated using a parameter of 6.7% for the long term expected rate of return. This assumption is equal to the expected average return on a fund which is invested in 60% equities and 40% bonds. No smoothing profits have been credited to the asset shares of continuing policyholders.

Chart 8.1



The smoothing account represents the accumulation of smoothing profits or losses over time. It depends critically on future economic conditions; and in particular it depends on how actual investment returns compare with the assumption used for the long-term expected rate of return. An inspection of the graph shows that in 50% of cases the smoothing reserve is negative after 20 years. This is as expected since the smoothed return is equal to the average of the actual return in each year and the long term average return on the fund.

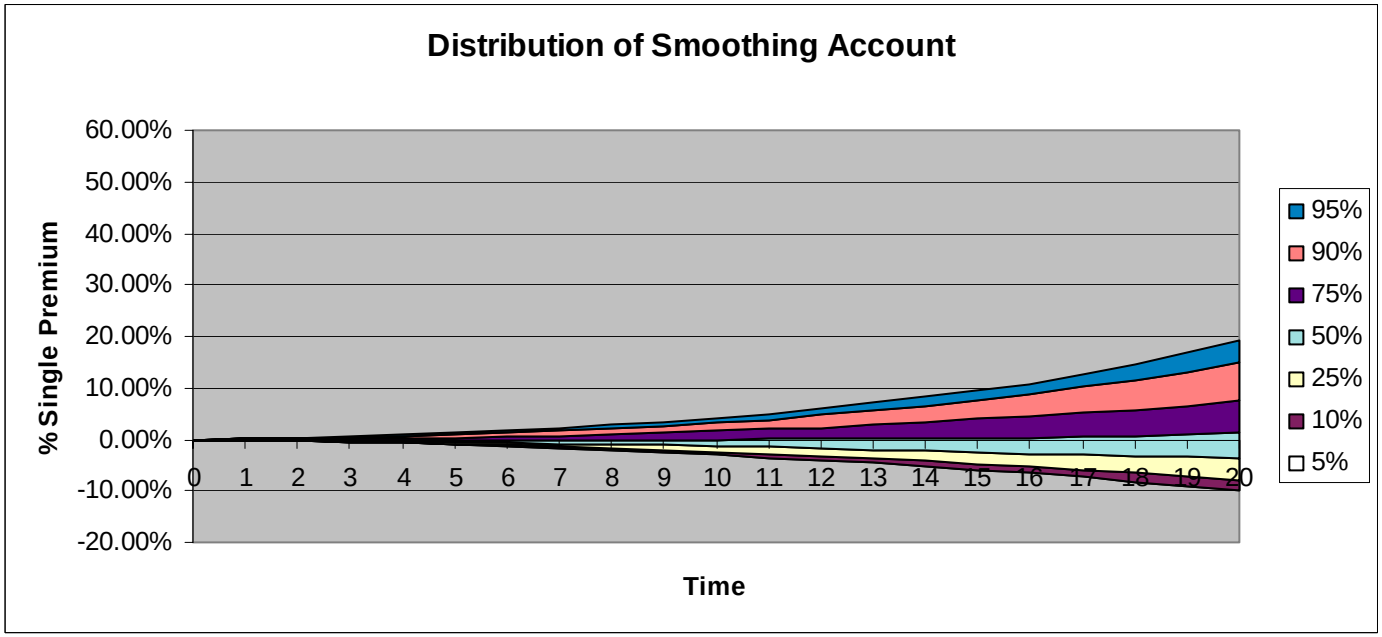
The economic value of smoothing for policyholders in the above case is 4.0% of the single premium. Given that smoothing profits and losses appear to be more or less equally possible in this scenario the economic value of smoothing might be expected to be close to zero. The positive value of smoothing to policyholders reflects the fact that smoothing benefits policyholders when it is most valuable i.e. when the underlying assets have performed poorly.

On this basis an economically "fair" annual fund charge to levy for the benefits of smoothing would be just under 0.3% pa. This charge has been included in the build-up of the smoothed policy value.

***Sensitivity to investment mix***

Chart 8.2 shows the development of the smoothing account where the equity backing ratio is assumed to be 30% and the long term return assumption for use in the smoothing rule is adjusted accordingly to be 5.6%.

Chart 8.2



The distribution of possible values for the development of the smoothing account is now narrower compared to the central run. This is caused by lower volatility of future investment returns when a lower percentage of the fund is invested in equities and a greater proportion in dated bonds.

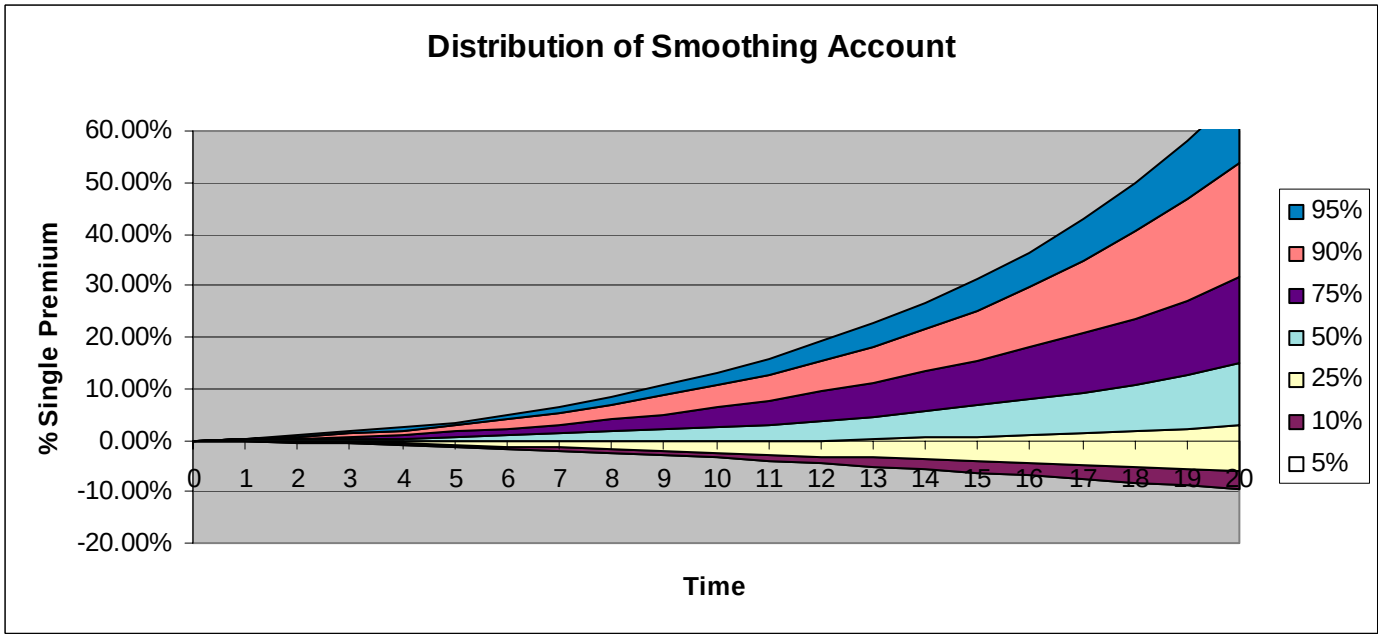
Since the long term return parameter is set to equal the expected return on the fund using the changed mix of assets, there is no shift in the location of the smoothing account (i.e. the 50$^{th}$ percentile is still centred approximately at zero).

The economic value of smoothing to policyholders in this case is 2.2% of the single premium – this makes intuitive sense as the actual asset returns are now less variable and the potential value of smoothing to a policyholder is hence lower. In the extreme case where asset returns had no volatility there would be no need for a product with smoothed investment returns.

***Sensitivity to 'expected return' parameter used in smoothing formula***

Chart 8.3 shows the distribution smoothing account percentiles where the long-term return assumption has been assumed to be equal to the prevailing return on cash in each simulation. This is an example of a more dynamic smoothing rule where the parameters will vary depending on the development of future economic conditions. An equity backing ratio of 60% is assumed.

Chart 8.3

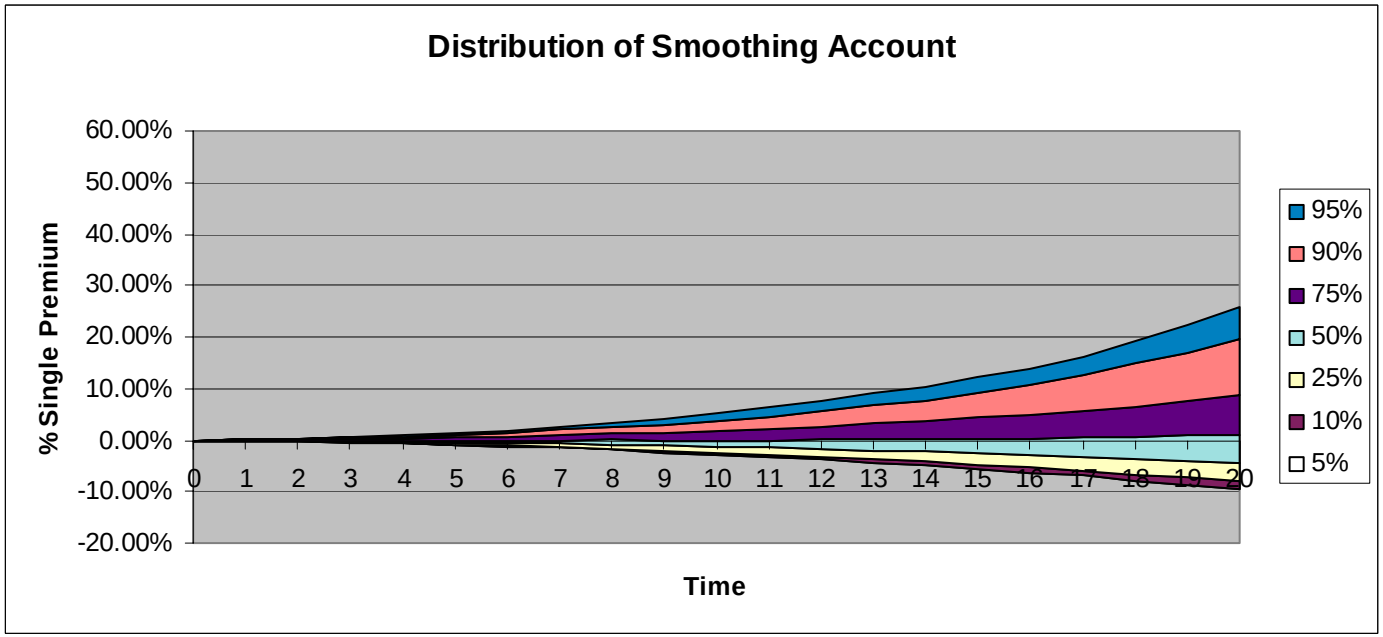


In this example only 25% of cases lead to a negative smoothing account after 20 years. There will only be one actual future, however, it is now more likely that smoothing surpluses will emerge in the future i.e. that the smoothing account will grow. The economic value of smoothing to policyholders is now negative (-0.6% single premium) as could be expected, reflecting the limited benefit of the mechanism to policyholders. Under circumstances such as these where the economic value is negative there is no theoretically correct "charge" for the smoothing feature of the product as the smoothing is run at an economic cost to policyholders.

***Sensitivity to smoothing profits and losses being retained within the policyholder fund***

Chart 8.4 is equivalent to the central assumptions except that 50% (rather than 0%) of the profits or losses on smoothing are now recycled into the asset values of the continuing policyholders.

Chart 8.4



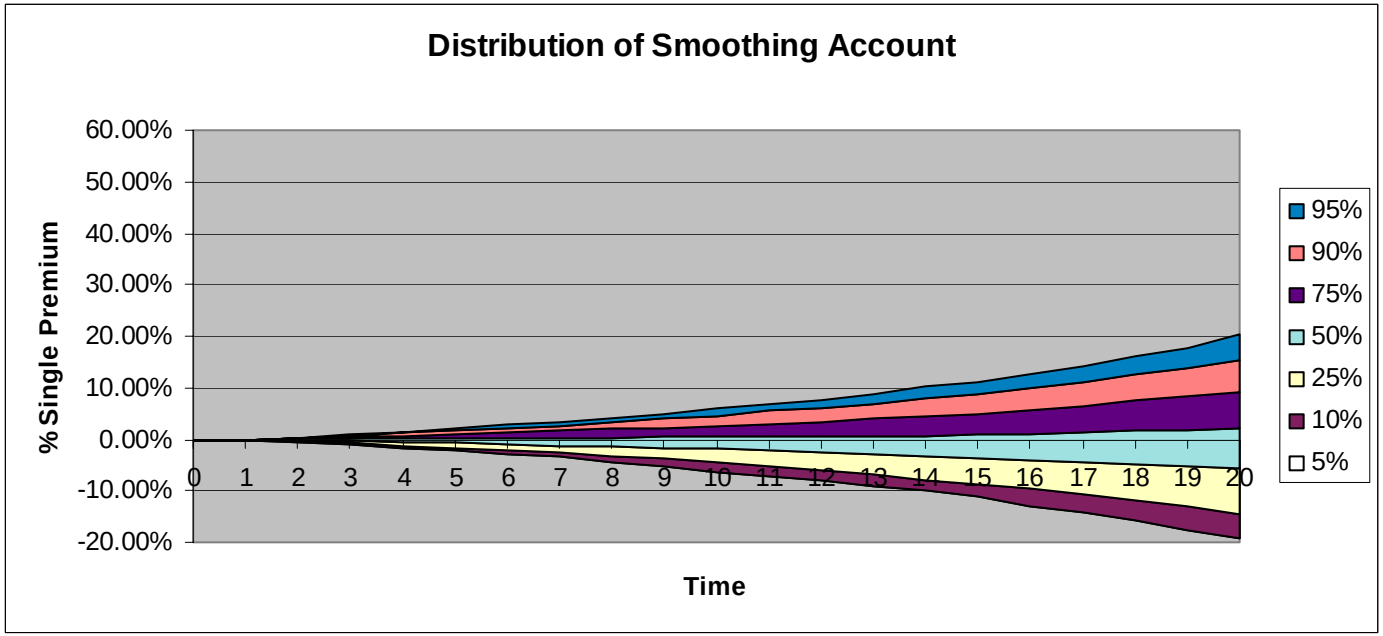
The distribution of the smoothing account is narrower than under the central assumptions. This is because some of the risks of smoothing are now borne by the continuing policyholders. In the ultimate case where 100% of the profits / losses from smoothing were credited to the asset shares of continuing policyholders, the smoothing account would be 0 in all cases.

The economic value of smoothing to policyholders as a group is 2% of the single premium in this case compared to 4% in the central scenario. The equivalent annual charge for smoothing would be approximately 0.15% pa.

***Sensitivity to smoothing rule***

Chart 8.5 shows the alternative smoothing rule where the smoothed investment return is equal to the average of the investment returns achieved during the preceding 3 years. (During the 1st and 2nd years of projection an average of the first 1 or 2 year's return as appropriate has been used.)

Chart 8.5




It demonstrates that different smoothing rules could lead to different outcomes for the development of the smoothing reserve.

The economic value of smoothing to policyholders is –0.3% of the single premium.

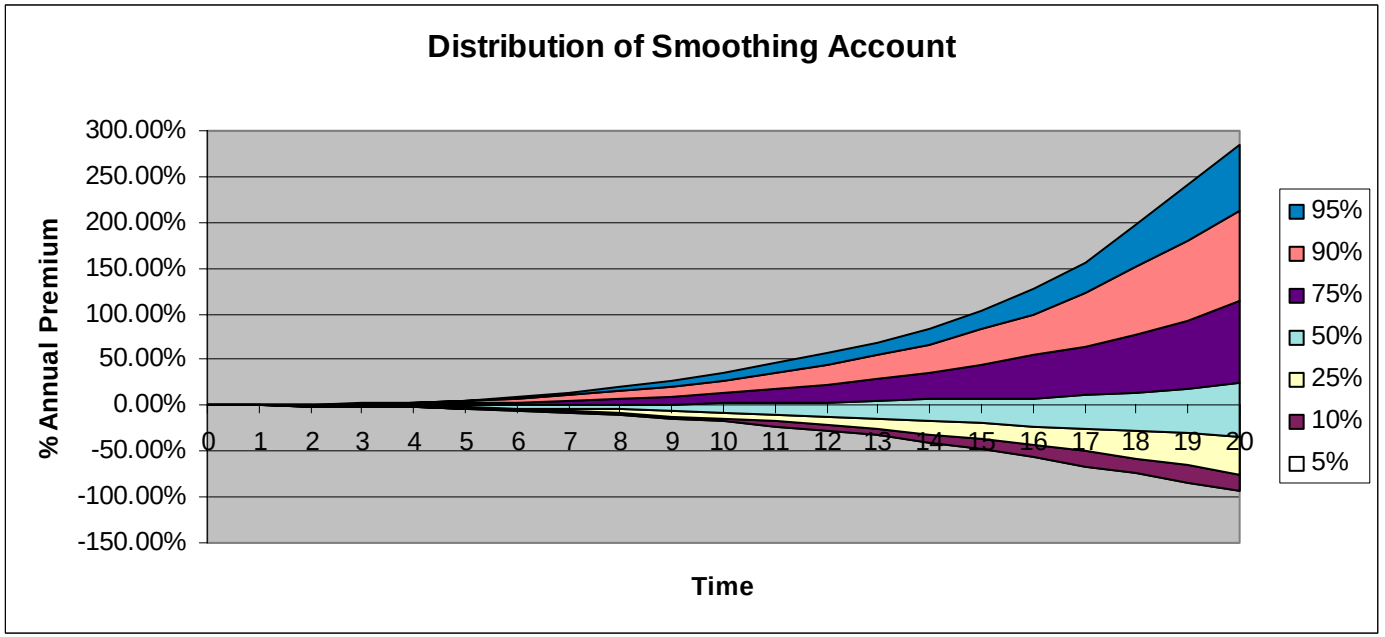
### *8.4.7 Regular premium*

This section provides some comparable analyses to those provided for single premium contracts for an equivalent regular premium policy. All amounts are expressed as a percentage of the regular premium.

***Central assumptions***

Figure 8.6 shows the distribution of smoothing account percentiles over time. Smoothed investment returns are based on a long-term expected return of 6.7% pa and an equity backing ratio of 60%. No smoothing profits have been credited to the asset shares of continuing policyholders.

Chart 8.6

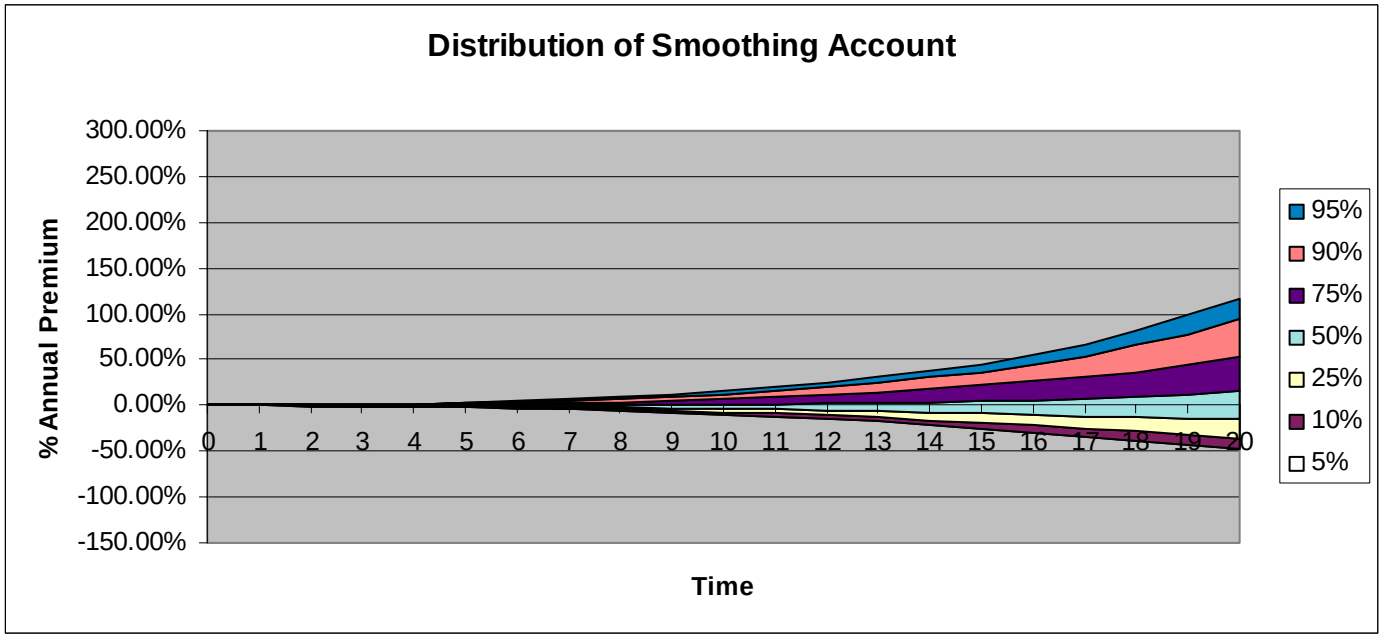



The economic value of smoothing here is 21.0% of the annual premium. An economically fair charge for smoothing would be 0.2% pa fund charge. (If 50% of smoothing profits were recycled this charge would fall to 0.1% pa).

***Sensitivity to investment mix***

Chart 8.7 shows the development of smoothing account percentiles where the Equity Backing Ratio is 30% and the long term return assumption is set to 5.6%.

Chart 8.7




The economic value of smoothing here is 10.9% of the annual premium.

### *8.4.8 Smoothing - Conclusions*

Left to its own devices a given smoothing rule will not be cost neutral with any certainty – there will only be one future and the smoothing account will grow and contract as events take their course. The development of the smoothing account is entirely dependent on the path of future investment returns. Companies can actively attempt to reduce the variability of the smoothing account by:

- Reducing the volatility of the investment mix;
- Feeding back a share of the profits/losses from smoothing into the asset shares of in-force policies;
- Possibly by adopting an appropriate hedging strategy in the smoothing account; or
- Amending the smoothing rule as experience unfolds.

As a result of these investigations it can be seen that there are difficulties in specifying a universal and acceptable smoothing charge which will be appropriate in all cases and that will lead to a zero balance for the smoothing account in the long-term. The smoothing charge will need to reflect:

- Changes in economic conditions over time;
- The definition of the smoothing rule and parameters used;
- The extent to which the profits and losses from smoothing are recycled into the asset shares of continuing policyholders.

Although these concepts may have a role in many target markets – as evidenced by the successful launch of several new generation "with-profits" funds, it may be appropriate to carry out further work so that the smoothing structure, charge, and customer disclosure is appropriate for the intended simplified sales regime.

## 8.5 Guarantees

### 8.5.1 Possible guarantees

One aspect of the HM Treasury's Consultation Document was to request input from the industry as to possible guarantees for potential inclusion into the Stakeholder suite of products. Various different types of guarantees that currently exist in the market include:

- A deposit account guarantees that capital will be returned at any time in the future, typically on demand;
- A guarantee may be given on a medium to long-term savings vehicle at a single (or multiple) given point in time. The guarantee could, for example, be a return at the agreed point in time of an agreed multiple of premium. The backing assets may be a mixture of equities and fixed interest assets with the guarantee met internally. Alternatively a structure of cash and derivatives could be used to match the guarantee from external sources, such as is used by several guaranteed equity bonds and capital protected unit trusts. The provider of a product offering smoothing may guarantee to apply the smoothing rule at certain times / on certain events in the future (i.e. there is a guarantee that no MVA is applied).

Only the second of these structures is considered in this Report since it tends to be the structure under which a specific charge for the guarantee is most easily expressed (for example on deposit based contracts the guarantee is implicitly reflected in the interest rate credited, while with capital protected unit trusts the costs of the derivative strategy is reflected in the overall fund performance).

Traditional with-profits business has not been modelled explicitly even though it contains guarantees both at the point of sale (through the sum assured) and also additional guarantees as reversionary bonuses are allocated. Although this business has not been modelled explicitly many of the conclusions can be applied to such business.

### 8.5.2 Methodology

The methodology used is to calculate an explicit annual fund charge that has the same economic value as the cost of providing the guarantee, i.e. to a consumer, a policy with a guarantee and with the explicit additional annual fund charge is equivalent on an economic basis to a policy with no guarantee and without that explicit additional fund charge. The economic cost of meeting guarantee costs from alternative sources such as shareholder funds or buying derivative instruments would be the same if the same methodology and assumptions were made to price each. The charge made would vary depending on the profit margins required by shareholders and the organisation offering the derivative and the cost of capital for each type of organisation. Shareholders would be subject to significant risk if they fund the guarantee costs directly whereas if a derivative package is used the risk lies with the writer of the derivative. As against that the policyholder is faced with the counterparty risk; i.e. the guarantee is only as good as the security of the organisation underwriting it.

In theory as the FSA moves towards a truly integrated prudential sourcebook then the gross capital needed to support a given financial risk will not vary as to whether the risk is being written by an insurer directly or placed with a bank or other supplier of derivatives (although the net capital for any particular risk may vary to the extent that the risk-carrier is able to diversify or offset conflicting risks).

As for the work on smoothing, the policy charge has been taken as 1% of fund with no allowance for any consequent profits or losses arising from that charge.

### *8.5.3 Results*

The following charts show the charges needed to meet the economic costs of two different types of guarantee (a return of premium guarantee and a return of premiums accumulated at 3% pa guarantee). Results are shown for a single premium contract first and then a regular premium contact. In each case results are shown with both an equity volatility of 17% and 25%. The equity-backing ratio is assumed to be 60%.

***Single premium: Return of premium guarantee***

Chart 8.8a

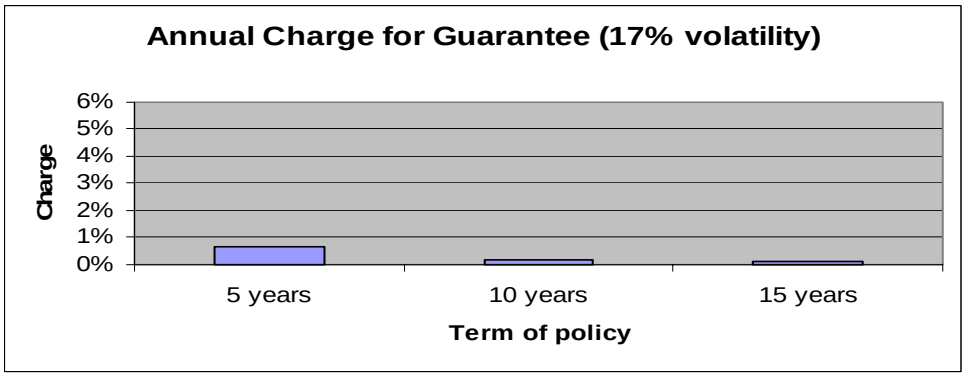
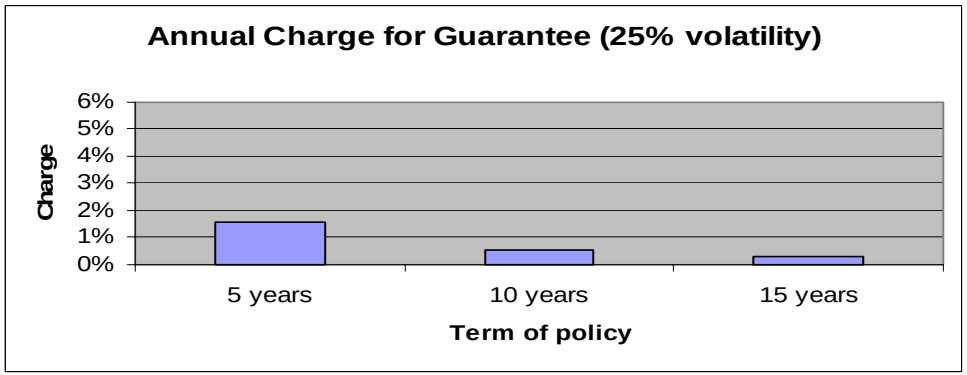



Chart 8.8b




***Single premium: Return of premiums + 3% guarantee***

Chart 8.9a

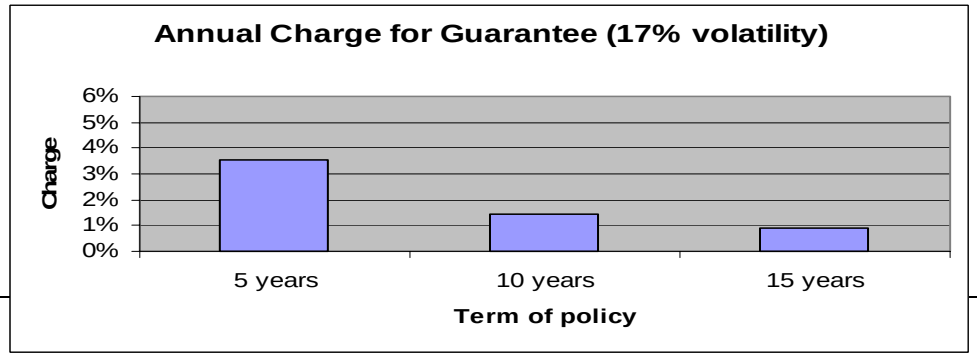
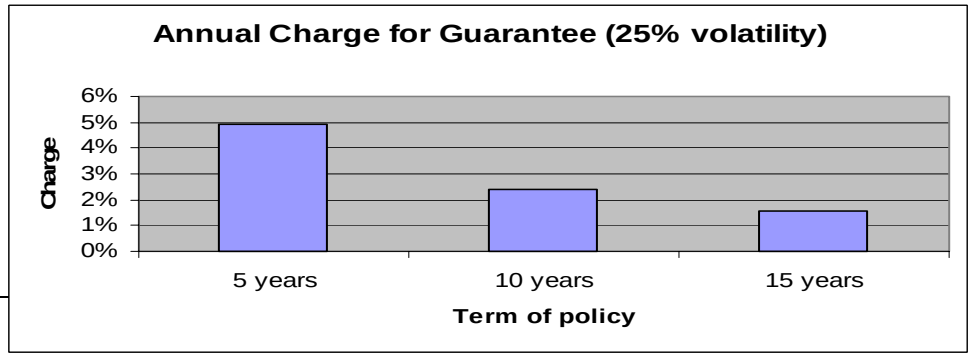



Chart 8.9b



***Regular premium: Return of premium guarantee***

Chart 8.10a

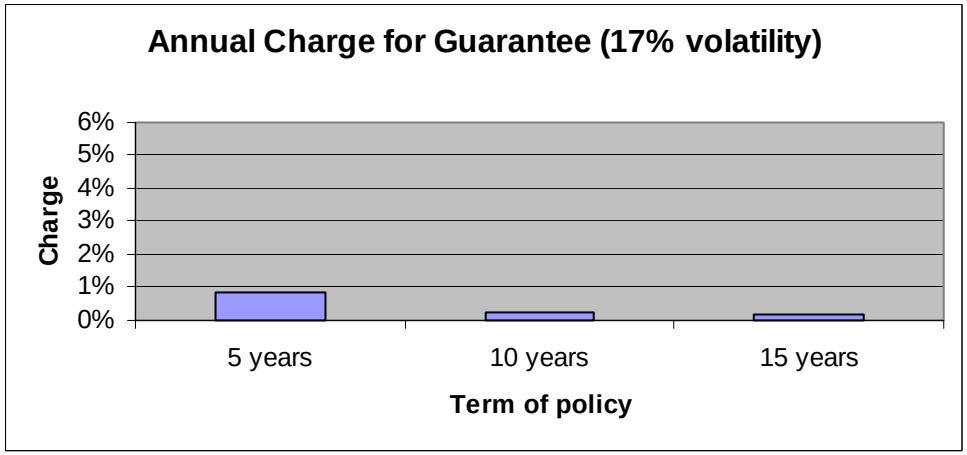
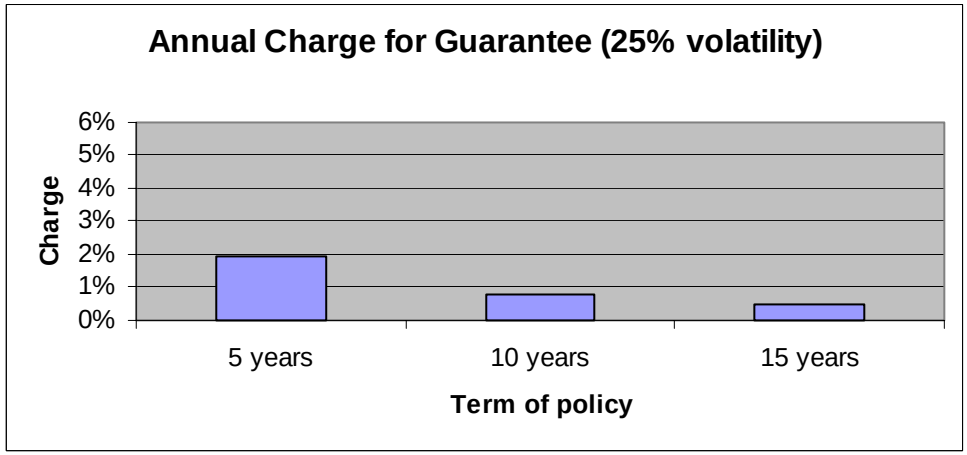



Chart 8.10b




***Regular premium: Return of premiums + 3% guarantee***

Chart 8.10a

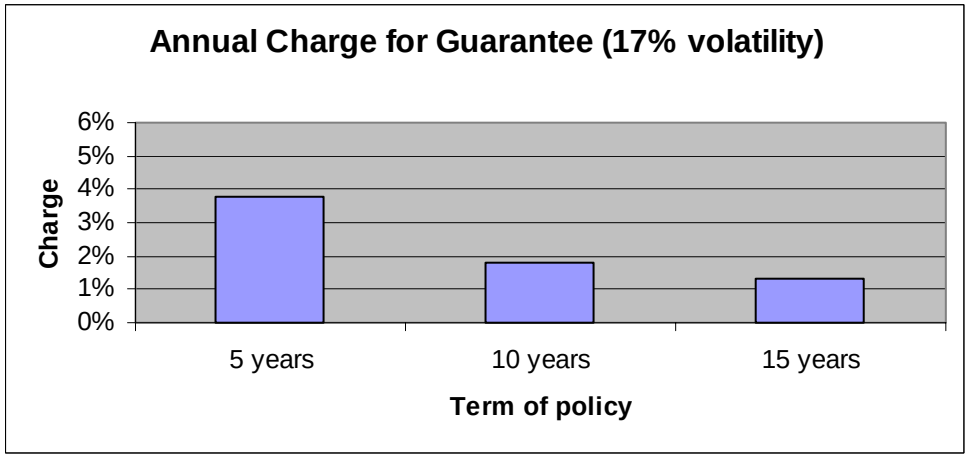
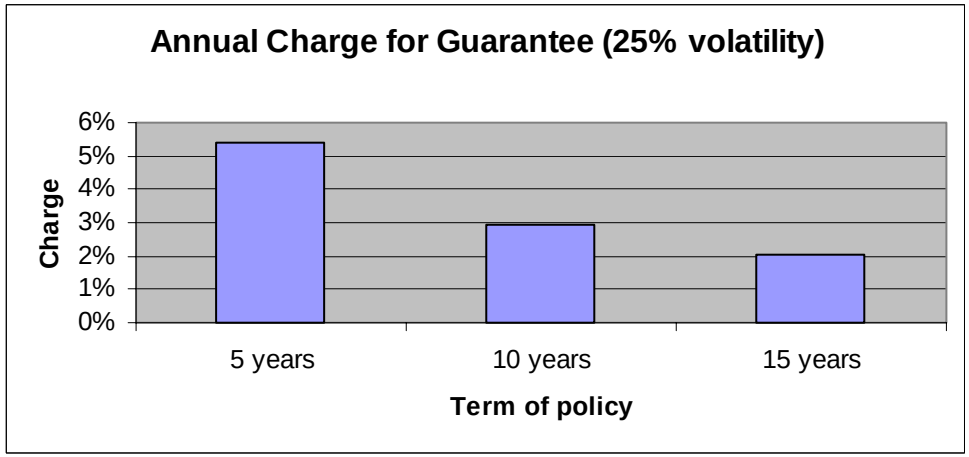



Chart 8.10b



### *8.5.4 Guarantees – Conclusions*

The following observations can be made based on the above results:

- The appropriate annual charge to make varies according to the time until the guarantee applies – the longer the time until the guarantee the smaller the required annual charge;
- The appropriate charge may vary considerably in different market conditions. For example the charge for guaranteed return of premium on a single premium contract more than doubles if equity volatilities move from 17% to 25%;
- It is not appropriate for charges for guarantees of this nature to be constrained by a charge cap of 1%.

The above theoretical charges are valid whether the guarantees are backed by shareholder funds or whether they are 'hedged' using derivatives (ignoring pricing issues such as expense loadings and profit margins). It is unlikely that shareholders would be prepared to meet the costs of such guarantee in return for an annual charge as if investment returns are poor, there is a large potential for losses. If providers offered guarantees of this nature using derivative packages individual consumers would need to decide whether the guarantee is worth the amount charged.