

Annexe 2B

Aviva's 2008 data update: evaluation of Aviva's aggregate PIP offer and the policyholder advocate's guidance to policyholders

LECG's analysis

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Report by: LECG Ltd.

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1.00 Introduction

1.01 Introduction

This annexe has been prepared by LECG Ltd. for the policyholder advocate. While care has been taken to explain the technical terms and concepts contained in this annexe, the complex issues involved will be better understood by readers with some familiarity with the concepts involved.

The purpose of this annexe is to provide and to describe LECG's commentary on the work that has been performed on updating the analysis that was included in the policyholder advocate's June 2009 report, "*A report by the office of the policyholder advocate in connection with the reattribution of the inherited estates of the CGNU Life and CULAC with-profits funds*".

The analysis of Aviva's reattribution offer included in the policyholder advocate's June 2009 report, which was based on 2006 data adjusted to take account of subsequent movements in size of the inherited estate, has been revised on the basis of year-end 2008 data, as agreed by the policyholder advocate and Aviva. This new data has been prepared by Aviva using the same approach as previously, but the data has been modified to reflect actual experience between 2006 and 2008 (especially in terms of investment returns over that period and lapse rates) and changes in assumptions that Aviva have made in respect of the future 25 year projection period. The year-end 2008 data also allows for actual new business written in the period since 2006.

Aviva's PIP offer is based on the size of the combined CGNU and CULAC inherited estates close to the date that the reattribution and fund transfer is effected, currently assumed to be 1 October 2009. The 'key reference point' for this valuation will be the Realistic Balance Sheet ("RBS") values prepared for the FSA.

In KPMG's view, the RBS figures often include elements of prudence which require adjustment before they can be used for the policyholder advocate's assessment of Aviva's offer. KPMG has therefore advised a number of adjustments to the RBS values which raise

the value of the combined inherited estates. In Appendix 35 to the policyholder advocate's June 2009 report, KPMG set out its estimate of the total size of the inherited estates at 31 December 2008, which included adjustments of £177 million at that date.

KPMG conducted a further review of Aviva's RBS figures at the end of May 2009 and has advised a number of adjustments to the RBS values which raise the value of the combined inherited estates used by the policyholder advocate when assessing the offer, by £174 million as at 31 May 2009 rolled forward to £176 million as at 1 October 2009 (see Chapter 1). This figure however included one very late change to the data provided to KPMG by Aviva to allow KPMG to finalise their adjustments. Previous to this, an adjustment had been estimated of £232 million as at 31 May 2009 rolled forward to £234 million as at 1 October 2009. In the time available to do the analysis, LECG had to use the previous higher figure and in this annexe has adjusted the size of the inherited estates upwards by £234 million at 1 October 2009 before estimating the potential future special distributions absent a reattribution to eligible policyholders, future policyholders and shareholders.

Given the lateness of this adjustment LECG has not been able to re-perform all of the analysis that is included in this report. Therefore, for the purposes of this annexe, LECG has assessed the impact this lower adjustment would have only on the conclusions we reach in relation to Aviva's base case – with an assumed estate value of £1,200 million at 1 October 2009 and with new business growth at 5 per cent per annum from 2011 onwards.

In this annexe we also review whether the latest data supports the conclusions reached in the June 2009 report relating to:

- the estimation of the aggregate potential special distributions to eligible policyholders;
- the estimation of the split of the residual estate in the reattribution;
- the estimation of Aviva shareholders' internal rate of return from the reattribution;

- the analysis of the allocation of the PIP and a comparison with the allocation of special distributions for individual eligible policies; and
- the development of guidance to groups of policyholders.

During this data update exercise we have also assessed the position of non-electors to ensure that the interests of non-electing policyholders are protected across a broad range of potential outcomes for future special distributions and potential voting patterns by eligible policyholders. The conclusions relating to non-electors are discussed in Annexe 3:

Safeguarding the value of potential special distributions to non-electing policyholders.

1.02 Summary of conclusions

The conclusions reached by LECG from its analysis of Aviva's year-end 2008 data are as follows. As with the analysis of the 2006 data, all conclusions assume that the FSA's current rules concerning uses of inherited estates remain in place.

- Aviva's aggregate offer still meets the policyholder advocate's two primary criteria: 1. Assuming an estate value of £1,200 million on 1 October 2009, eligible policyholders are expected to receive an aggregate PIP of £500 million, which is far greater than possible future aggregate special distributions under Aviva's new business assumptions of £55 million, and 2. eligible policyholders are expected to receive more than 50 per cent (63 per cent) of the residual value of the inherited estates under Aviva's new business assumptions for an assumed estate value of £1,200 million as at 1 October 2009;
- LECG's estimated shareholder internal rate of return ("IRR") from the reattribution, at an assumed estate value of £1,200 million, is 9.0 per cent; in comparison with the analysis using year-end 2006 data, the shareholder IRR has decreased by less than the fund rate, implying a proportionate increase in the level of profit to shareholders from the reattribution. The fairness of the return to shareholders is for the FSA to consider; and

- at least 96 per cent of policies would be better off accepting the PIP under Aviva's new business assumptions and assuming an estate value of £1200 million on 1 October 2009.

In comparison with the analysis using the year-end 2006 data, the year-end 2008 data analysis shows that:

- eligible policyholders' potential future aggregate special distributions are projected to be £55 million instead of £83 million, under Aviva's new business assumptions for an assumed estate value of £1,200 million;
- eligible policyholders' share of the residual value of the inherited estates is slightly higher (63 per cent instead of 60 per cent);
- LECG's estimated shareholder IRR is more than 1 per cent lower as a result of Aviva's lower projected investment returns (9 per cent instead of 10.3 per cent). However, as noted previously, the shareholder IRR has decreased by less than the fund rate, implying a proportionate increase in the level of profit to shareholders from the reattribution. Correspondingly when the higher investment returns are used, the estimated shareholder IRR recovers in line with the higher investment returns;
- the estimated proportion of eligible policies with a PIP offer that is higher than potential future special distributions is effectively unchanged (96 per cent);
- there are no significant changes to the guidance that was given to policyholder groups 1 (regular premium policies with a maturity or surrender date up to and including 2016), 2 (single premium policies with no fixed maturity) and 3 (regular premium policies with a maturity or surrender date between 2017 and 2021) and therefore we recommend that no new guidance be issued; and
- there are more significant changes to guidance for eligible policyholders in group 4 (regular premium policies with a maturity or surrender date beyond 2021). However, due to immaterial differences between distributions in later

years and the high degree of volatility around break-even years depending on the assumptions made, we believe it is not necessary to reissue the guidance.

LECG believes that Aviva should review its new business assumptions for 2009 and 2010 and revise them following the withdrawal of the Inflation Protected Guarantee bond option (“IPG bond”), which accounted for a significant portion of the annual projected sales in 2009; to meet Aviva’s new business assumption for 2009, remaining sales of other bonds and pensions would have (and Aviva projects them) to be significantly higher than in the first half of the year. Aviva has not provided any rationale for why the sales of pensions and other bonds are forecast to significantly increase in the second half of 2009. Aviva has stated it is not revising its assumptions for 2009 and 2010. An additional new business sensitivity beginning with 50 per cent of Aviva’s new business assumption in 2010 and applying Aviva’s assumption of 5 per cent annual growth thereafter was considered in response to this issue.

LECG also performed its analysis assuming investment returns that were approximately 0.5 per cent higher than assumed in Aviva’s 2008 data in each year of the projection period. This analysis illustrated that the position of eligible policyholders is not materially affected.

1.03 Structure of this annexe

The remainder of this paper is structured as follows:

- Section 2 summarises the main changes in the data compared to the year-end 2006 data and Aviva’s process for updating to the year-end 2008 data;
- Section 3 summarises the results of Aviva’s analysis of the reattribution offer based on the year-end 2008 data;
- Section 4 provides a review of LECG’s analysis of Aviva’s offer against the policyholder advocate’s criteria for assessing the reattribution; and
- Section 5 provides an overview of the implications for the guidance offered to policyholders after considering 2008 year-end data.

2.00 Aviva's 2008 data update process

2.01 Introduction

This section describes the key features of the data and assumptions that have changed in the year-end 2008 data. This section also describes the assurances over the robustness of the data that have been provided by Aviva and any other recent events that have been considered in the updated analysis of the reattribution offer.

2.02 Key changes since the year-end 2006 data was produced

The data underlying the analysis in the policyholder advocate's report in June 2009 used data provided by Aviva based on projections from year-end 2006. The analysis in the policyholder advocate's report did allow for changes in the size of the estate, but not other changes that have occurred since the end of 2006. There are three key parts of the data affecting the policyholder advocate's analysis of the reattribution offer that have changed significantly since 2006:

- asset shares of eligible policies;
- Aviva's actual lapse experience; and
- expected future investment returns.

These are discussed in turn below.

2.03 Asset shares of eligible policies

There is currently a severe downturn in the global economy. Over the past two years, asset values around the world have fallen significantly. These falls have reduced the current value of the policies that are eligible for the reattribution. The value of the eligible policies affects the share of potential future special distributions that they can expect (relative to new business). Therefore, the revised value of current policies needs to be taken into account when assessing the reattribution offer.

2.04 Aviva's actual lapse experience

Aviva has used its recent experience of lapses to project future expected lapses. Between 2006 and 2008, Aviva has experienced significantly different lapses in the funds compared to what it projected in the year-end 2006 data. Lapse rates were, in general, lower than expected over the two year period. Aviva has therefore revised its forecast lapse rates. In comparison with the year-end 2006 data, Aviva has increased lapse rates on open maturity policies and reduced lapse rates on regular premium policies with fixed maturities. If policies remain in the funds for different amounts of time compared to the 2006 data, then those policies will have different expectations of potential future special distributions which might impact the results of the analysis carried out.

Lapse rates can affect both the profile of distributions over time and which policies share in any given distribution. As policies leave the funds, less capital is required to support the remaining policies. This capital, that has been made available by policies that have lapsed, can form part of a special distribution to remaining policyholders. Therefore, all things being equal, if lapse rates in the funds increase, distributions from the inherited estate will occur sooner and be larger (however there will be fewer eligible policies sharing in those distributions), and vice versa. Further, policies that remain in the fund for a longer period of time can expect to share in more special distributions than they would otherwise, and vice versa.

2.05 Expected future investment returns

There have been significant stock market falls around the world over the last two years. Many governments (including the UK) have lowered interest rates in response to these stock market falls. The Bank of England Base Rate in the UK is currently at 0.5 per cent¹ - an historic low. This has a knock-on effect on the investment returns that can be expected in the future. A fall in the long-run expected return of the fund, changes the profile of expected special distributions. With a lower return on the fund, it will, all else being equal, take longer

¹ Source: Bank of England.

for the special distribution threshold to be reached. Furthermore, the distribution will also be smaller.

For the purposes of projections based upon the year-end 2006 data, the pre-tax return on the fund was forecast to be 6.6 per cent per annum. For the purposes of projections based upon the year-end 2008 data, the pre-tax return projection has fallen to 5.5 per cent per annum, a fall of 1.1 per cent per annum. Professor Brealey (Exhibit A) has provided his view on the likely changes in long-run investment returns between the end of 2006 and the end of 2008 and has concluded that he would not expect a fall in long-run returns greater than around 0.5 per cent per annum. This is a significantly lower than the fall of 1.1 per cent per annum in Aviva's year-end 2008 base case data. Therefore, the policyholder advocate has performed a sensitivity analysis using year-end 2008 data provided by Aviva with investment returns that are 0.5 per cent per annum higher than in the base case assumptions.

2.06 New business sales

In the June 2009 report the policyholder advocate stressed the importance of new business levels on the potential special distributions that eligible policyholders may receive. New business defers potential special distributions (as additional capital is needed to support the new business requirements) whilst distributions to eligible policyholders are also deferred as they have to be shared with new business policyholders.

The policyholder advocate also reflected the inherent uncertainty of projecting increasing levels of new business over the 25 year projection period. The current economic conditions have proved a case in point. In April 2009, Aviva withdrew its with-profits Inflation Protected Guarantee bond option because it had become unprofitable. The IPG bond accounted for a significant proportion of Aviva's new business sales since its introduction at the beginning of 2006. Aviva's latest forecast for new business sales in 2009 (based on actual sales up to 30 June 2009 and projections until 31 December 2009) shows that the IPG bond accounts for around 60 per cent of annual sales, even though it was only available for less than four months of the year.

The table below shows Aviva's actual and forecast new business sales for 2009.

Table 1 Aviva's 2009 new business sales, APE, £ million

	January to June 2009 actual sales	July to December 2009 projected sales	2009 sales
Pensions	6.5	14.9	21.4
IPG bond	58.9	0	58.9
Other bond	10.2	14.2	24.4
Total	75.6	29.1	104.7
Aviva's new business assumptions			116

Source: Aviva and LECG analysis

APE = annual premium equivalent

The table above shows that if the period July to December 2009 is indicative of the level of new business that Aviva is able to sell without the IPG bond, then 2009 annual sales would be around £58.2 million, compared to Aviva's new business assumption for the reattribution analysis of £116 million, a fall of 50 per cent. To meet Aviva's new business assumption for 2009, remaining sales of other bonds and pensions would have (and Aviva projects them) to be significantly higher than in the first half of the year.

Aviva has not provided any rationale for why the sales of pensions and other bonds are forecast to significantly increase in the second half of 2009. Therefore, LECG's position is that Aviva should review its new business assumptions for 2009 and 2010 and adjust them based on actual experience. Aviva has stated it is not revising those assumptions.

The policyholder advocate understands that, as part of its planning cycle for the coming year, Aviva's marketing team is currently looking at options for a product to replace the IPG bond. To take the withdrawal of the IPG bond into account in the analysis of the reattribution, the policyholder advocate has considered an additional new business sensitivity, in which 2007 to 2009 follow Aviva's actual new business sales and forecasts, but from 2010 onwards, the assumed level of new business is 50 per cent of Aviva's assumption (i.e. new business sales grow at 5 per cent per annum, but from a lower base).

3.00 Results of Aviva’s updated analysis

Aviva’s analysis of the reattribution included in the Election Mailing Pack (“EMP”) and the Actuarial Function Holder’s report (“the AFH report”) was based on projections made from 31 December 2006 (as was the policyholder advocate’s analysis). Aviva has updated its analysis based on data and projections as at 31 December 2008 to see whether its conclusions based on the year-end 2006 data are materially different. In this section we present the results of Aviva’s updated analysis.

3.01 Aviva’s updated estimate of VPDP

Aviva uses projections from its stochastic models to estimate the Value of Potential Distributions to Policyholders (“VPDP”). The table below compares Aviva’s estimates from the year-end 2008 data with those included in the AFH report (which is based on the year-end 2006 data).

Table 2 Aviva’s estimate of VPDP, £ million

1 October 2009 assumed estate value	AFH Report VPDP	Year-end 2008 data VPDP	Change
1,200	103	95	(8)
1,400	161	137	(24)
1,600	233	190	(43)

Source: Aviva and LECG analysis

The table above shows that Aviva’s estimate of VPDP has fallen across the range of estate values. At an assumed estate value of £1,200 million, VPDP has fallen from £103 million to £95 million. At higher assumed estate levels, the fall in VPDP is proportionally more.

3.02 Aviva’s updated PIP break-even analysis

In the EMP, Aviva said that the reattribution offer was “good value” for 99 per cent and “excellent value” for 95 per cent of policyholders. Aviva’s definition of “good value” is that policyholders would have to wait 10 years for the present value of expected future special

distributions to exceed the PIP they are being offered. Under Aviva’s definition of “excellent value”, policyholders would need to wait for 25 years.

The tables below show Aviva’s PIP break-even analysis. The first table shows Aviva’s analysis based on the year-end 2006 data. The second table shows Aviva’s analysis based on the year-end 2008 data and assuming an estate value of £1,529 million.² The third table shows Aviva’s analysis based on the year-end 2008 data and assuming an estate value of £1,200 million.

Table 3 Aviva’s PIP break-even analysis based on year-end 2006 data

Break-even period	By number of policies	By value of policies
0 to 5 years	0.00%	0.00%
5 to 10 years	0.00%	0.00%
10 to 15 years	0.20%	0.17%
15 to 20 years	2.08%	2.51%
20 to 25 years	1.35%	1.11%
Over 25 years	96.37%	96.21%

Source: Aviva

² The estate value of £1,529 million refers to Aviva’s published year-end 2008 figure. Aviva subsequently published a post year-end adjustment to the value of the estate of £41 million. Therefore, this estate value of £1,529 million is comparable with the assumed estate value of £1,570 million used in LECG’s analysis.

Table 4 Aviva’s PIP break-even analysis based on year-end 2008 data and an assumed estate value of £1,529 million

Break-even period	By number of policies	By value of policies
0 to 5 years	0.00%	0.00%
5 to 10 years	0.00%	0.00%
10 to 15 years	0.46%	0.99%
15 to 20 years	0.78%	0.65%
20 to 25 years	1.40%	1.75%
Over 25 years	97.36%	96.61%

Source: Aviva

Table 5 Aviva’s PIP break-even analysis based on year-end 2008 data and an assumed estate value of £1,200 million

Break-even period	By number of policies	By value of policies
0 to 5 years	0.00%	0.00%
5 to 10 years	0.00%	0.00%
10 to 15 years	0.29%	0.65%
15 to 20 years	0.16%	0.33%
20 to 25 years	0.01%	0.00%
Over 25 years	99.55%	99.01%

Source: Aviva

The tables above show that the move to the year-end 2008 data has lengthened the break-even period for policyholders and therefore increased the proportion for whom the offer represents “good value” or “excellent value”. With the year-end 2008 data and an assumed estate of £1,200 million, Aviva’s analysis says that the offer represents “excellent value” for over 99 per cent of policies.

3.03 Aviva's analysis of the safety net

Aviva has updated its analysis of non-electors and the safety net payment based on the year-end 2008 data and the current voting responses. The position of non-electors is discussed further in Annexe 3 to this report.

3.04 Aviva's estimate of shareholders internal rate of return

In its analysis of the reattribution offer provided to the policyholder advocate, Aviva said that its expected shareholder IRR from the reattribution was between 8.2 and 10.6 per cent for assumed estate sizes of £1,200 million and £2,500 million, respectively. In a presentation to analysts in May 2009, Aviva presented a shareholder IRR of 13.5 per cent, based on a reattribution estate of £1,250 million and assuming a take-up rate of 80 per cent.

In June 2009, Aviva provided a reconciliation between the two quoted IRRs to the FSA, which has subsequently been provided to the policyholder advocate. Aviva explain that there are three main reasons for the differences in the two IRRs:

- *“The stated IRRs differ, reflecting the different bases used in the IRR calculations”;*
- the 13.5 per cent IRR *“captured all of the financial benefits of the wider Wagner programme”;* and
- the 13.5 per cent IRR also included *“an update of the assumptions to reflect emerging end 2008 data and results”.*

The impact on the cash flows used to calculate the IRR is discussed below.

Treatment of 2007 new business subsidy³

As described in Annexe 1 of this report, the new business subsidy paid from the estate in 2007 was £■■■■ million, which rolled forward by the growth rate of the fund is £■■■■ million at 31 May 2009. For the IRR calculations presented to the policyholder advocate as part of the

³ Aviva has required that some of these figures be blanked out on the basis that they are commercially sensitive. The policyholder advocate believes these figures are not commercially sensitive and should be disclosed.

negotiations, Aviva included the £[redacted] million as a notional refund to the estate. In the 13.5 per cent calculation, Aviva has included the 2007 new business subsidy as a £[redacted] million immediate cash benefit since, if the reattribution proceeds, Aviva has agreed with the FSA that it does not have to refund the 2007 new business subsidy in the New With-Profits Sub Fund (“New WPSF”). This change in treatment of the 2007 new business subsidy resulted in a difference of 1.3 per cent in the two shareholder IRRs.

Profits from shareholder equity put option

In the 13.5 per cent IRR calculation, Aviva has included an £[redacted] million cash flow for the “Allowance for Profits from Shareholder Option”. The inclusion of the cash flow arising from this equity put option accounts for a large portion (3.3 per cent) of the difference between the shareholder IRR originally presented to the policyholder advocate and the shareholder IRR presented to analysts. Aviva describes this cash flow as:

“In mid 2008, an equity put option was purchased by shareholders in its non-profit funds as a partial hedge against some of the equity risk in the estate. Whilst this did partially offset some of the loss in value from the net effect of the adverse market movements in 2008 and the restructured deal, the resultant shareholder value expected to be generated by the reattribution has fallen from that envisaged when the £1bn offer was agreed (even allowing for the option). As this investment was outside of the estate and not contingent on the reattribution it was excluded from the IRR calculations performed for the offer letter but, as a component of aggregate profit it was included in the IRR for the analysts’ presentation.”

Aviva did not disclose the existence of this option to the policyholder advocate during the assessment of the reattribution and the policyholder advocate only became aware of its existence during July 2009.

[REDACTED]⁴
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]⁵
[REDACTED]
[REDACTED]

[REDACTED]
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Aviva has not provided supporting evidence or calculations; the policyholder advocate has therefore been unable to replicate Aviva’s calculations. The FSA has said it will review Aviva’s IRR in its fairness review.

⁴ Aviva has required that these sections be blanked out on the basis that they are commercially sensitive. The policyholder advocate believes these figures are not commercially sensitive and should be disclosed. Aviva states that the FSA wishes this information to remain confidential.

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4.00 Review of updated analysis based on 2008 year-end data

4.01 Introduction

As outlined in the policyholder advocate's June 2009 report, Aviva is offering eligible policyholders a Policyholder Incentive Payment ("PIP") in exchange for their interest in potential future special distributions from the inherited estates of the funds. If eligible policyholders accept the reattribution, in most cases they will receive a cash payment. The terms of the reattribution scheme are intended to ensure that guaranteed benefits and regular benefits to policyholders are unaffected by the reattribution. The analysis therefore assumes that guaranteed and regular benefits to policyholders are identical, whether there is a reattribution or not. The analysis in this section focuses on a comparison of the special distributions to eligible policyholders absent a reattribution with the Aviva PIP offer.

This analysis is based upon:

- year-end 2008 data provided by Aviva that projects the funds' future assets and liabilities under Aviva's best estimate assumptions and data that contains information on individual eligible policies;
- counterfactuals based on alternative data provided by Aviva and alternative assumptions about the future made by the policyholder advocate;⁶ and
- two models that have been used by LECG to analyse the financial position of shareholders and the different groups of policyholders using the data provided by Aviva and various different assumptions. These models are described in further detail in Appendix 33B to the policyholder advocate's June 2009 report: *Modelling for the purposes of the reattribution*.

Below, LECG sets out its analysis of Aviva's aggregate offer to eligible policyholders of the CGNU Life and CULAC with-profits funds using year-end 2008 data. Where applicable, differences arising between this analysis and that based on year-end 2006 data are described

⁶ A counterfactual is a hypothetical scenario that is contrary to certain other events. In the present context, Aviva and the policyholder advocate have constructed counterfactuals about what would happen if the reattribution did not proceed. These counterfactuals are then used as 'base lines' against which to compare Aviva's reattribution proposals.

and explained. The methodology and modelling procedures have remained consistent across the two data sets. Detailed explanations of that methodology and of the theory underpinning the analysis of the reattribution can be found in the policyholder advocate's June 2009 report, "*A report by the office of the policyholder advocate in connection with the reattribution of the inherited estates of the CGNU Life and CULAC with-profits funds*", and in the appendices to that report, all of which are available at www.policyholderadvocate.org.

4.02 Basis for evaluation of Aviva's offer

The policyholder advocate has assessed Aviva's reattribution offer to policyholders, given current FSA regulations, against four basic criteria:

- an aggregate PIP offer that exceeds the aggregate value of the special distributions that policyholders would potentially receive from their interest in the inherited estates across a range of scenarios, under current FSA regulations;
- a reasonable share of the estate for eligible policyholders (at least 50 per cent of the 'residual value' under Aviva's new business assumptions) that, without a reattribution, would have gone to future policyholders, but with a reattribution is shared, after meeting the costs and taxes associated with a reattribution, between eligible policyholders and shareholders;
- an allocation mechanism for the PIP that correlates as closely as possible to policyholder special distributions forgone, given the data and technical constraints faced by Aviva; and
- for non-electors, protection of their aggregate potential special distributions without a reattribution following the transfer of their policies to the Old With-Profits Sub-Fund ("Old WPSF").

The remainder of this section considers Aviva's offer based on the first of these three criteria; the fourth criterion, the protection of non-electors, is considered separately in Annexe 3 to this report. Specific guidance to groups of policyholders is considered in Section 5 of this annexe.

LECG has also been asked by the policyholder advocate to calculate Aviva shareholders' estimated internal rate of return from the reattribution transaction. It is the FSA's responsibility to decide if that return is fair in the circumstances. The FSA has been provided with the results of LECG's calculations.

4.02.1. Valuation of the inherited estates

Aviva's PIP offer is based on the size of the combined CGNU and CULAC inherited estates close to the date that the reattribution and fund transfer is effected, currently assumed to be 1 October 2009. The 'key reference point' for this valuation will be the Realistic Balance Sheet values prepared for the FSA.

In KPMG's view, the RBS figures often include elements of prudence which require adjustment before they can be used for the policyholder advocate's assessment of Aviva's offer. KPMG has therefore advised a number of adjustments to the RBS values which raise the value of the combined inherited estates for the purposes of assessing the offer. In Appendix 35 to the policyholder advocate's June 2009 report, KPMG set out its estimate of the total size of the inherited estates at 31 December 2008, which included adjustments of £177 million at that date.

KPMG conducted a further review of Aviva's RBS figures at the end of May 2009 and has advised a number of adjustments to the RBS values which raise the value of the combined inherited estates for the purposes of assessing the offer by £176 million at 1 October 2009 (see Chapter 1). This figure however included one very late change made by Aviva to the data. Previous to this, an adjustment had been estimated of £234 million. In the time available to do the analysis, LECG had to use the previous figure and in this report has adjusted the size of the inherited estates upwards by £234 million at 1 October 2009 before estimating the potential future special distributions absent a reattribution to eligible policyholders, future policyholders and shareholders.

Given the timing of this late adjustment LECG has not been able to re-perform all of the analysis that is included in this report. Therefore, for the purposes of this report LECG has assessed the impact this lower adjustment would have on the conclusions we reach in relation

to Aviva's base case – with an assumed estate value of £1,200 million at 1 October 2009 and with new business growth at 5 per cent per annum from 2011 onwards.

4.03 Potential future special distributions to policyholders and shareholders

To evaluate Aviva's PIP offer and the proposed reattribution, it is necessary to consider what the positions of eligible policyholders and shareholders might have been absent a reattribution. As the terms of the reattribution scheme are designed to preserve the regular and guaranteed benefits of policyholders, this involves estimating the potential value of special distributions, absent a reattribution, which eligible policyholders will give up if they accept Aviva's reattribution offer. This section describes the analysis of potential special distributions of excess surplus to eligible policyholders, shareholders and future policyholders in the absence of a reattribution.

The analysis contained in this annexe is based on data provided by Aviva in response to requests from LECG. The accuracy of the analysis is therefore dependent on the accuracy of the fund projections provided by Aviva. The data provided by Aviva is based on its "best estimate" of the funds' future performance on a deterministic basis. Using this data, the position of the funds and any special distributions are projected over a 25 year period from 2008, after which, for analytical convenience, the remaining inherited estate is assumed to be split between eligible policyholders and shareholders according to the 90:10 principle of the funds.⁷

LECG has used a range of alternative new with-profits business assumptions to model the effects of new with-profits business on the value of special distributions to eligible policyholders. The impact of new with-profits business on the value of potential special distributions to eligible policyholders is described in detail in Appendix 39 to the policyholder advocate's June 2009 report: *The Impact of FSA Guidance on Policyholders*. This explains that a higher level of new with-profits business which, under current FSA rules, is supported

⁷ This assumption is made by LECG and by Aviva in the data provided in order to facilitate the modelling process. It does not materially affect the analysis performed.

by inherited estate capital that is retained in the funds, serves to defer and dilute the interests of eligible policyholders in any special distributions made. Under current regulations, therefore, the level of new with-profits business assumed in the projections is critical to the value of potential special distributions to eligible policyholders.

Therefore, LECG has estimated the potential future special distributions to all eligible policyholders, future policyholders and shareholders across four new with-profits business sensitivities:

- Aviva's new business assumptions until 2010, with annual growth of 5 per cent thereafter;
- an alternative assumption determined by the policyholder advocate with Aviva's new business assumptions until 2010 and an annual decline of 5 per cent thereafter;
- an alternative assumption determined by the policyholder advocate with Aviva's new business assumptions until 2010 and an annual decline of 15 per cent thereafter; and
- an alternative assumption determined by the policyholder advocate based on 2009 actual new business experience: 50 per cent of Aviva's assumed new with-profits business in 2010, with annual growth of 5 per cent thereafter (i.e. 50 per cent of Aviva's new business assumptions in any given year).

The first three of these new business assumptions were also analysed using year-end 2006 data, and the results of that analysis, which appeared in the policyholder advocate's June 2009 report, appear in brackets where applicable for comparison. The fourth sensitivity was not tested using year-end 2006 data and therefore no comparable figures are shown.

The four new business assumptions have been tested across 1 October 2009 assumed estate values of £1,200 million and £1,570 million.⁸ Aviva's aggregate PIP offers at different

⁸ In the policyholder advocate's June 2009 report, additional assumed estate sizes of £1,800 million, £2,100 million and £2,500 million were considered. Given the actual value of the estates during the summer of 2009, these values are now considered very unlikely and therefore are not considered.

assumed estate values are also considered at 1 October 2009 present values. The resulting projections of aggregate special distributions to all policyholders and shareholders are shown in Table 6 and Table 7 below. For comparison, the figures published in the policyholder advocate's June 2009 report, which were based on year-end 2006 data, are shown in brackets.

Table 6 Present value of potential future special distributions of excess surplus absent a reattribution, assumed estate value of £1,200 million at 1 October 2009, £ million, figures in brackets indicate comparables using year-end 2006 data

Assumption	Eligible policyholders	Future policyholders	Shareholders	Eligible policyholders' share of distributions to all policyholders
Aviva new business assumptions: 5 per cent per annum increase	65 (83)	1,164 (1,087)	137 (130)	5% (7%)
Alternative new business assumption: 5 per cent per annum decrease	243 (292)	986 (886)	137 (131)	20% (25%)
Alternative new business assumption: - 15 per cent per annum decrease	376 (431)	853 (753)	137 (132)	31% (36%)
Alternative new business assumption: 50 per cent of Aviva base case	225	1,004	137	18%

Source: LECG analysis

The adjusted estate value is £1,434 million, including £232 million adjustments at 31 May 2009, as advised by KPMG rolled forward to £234 million at 1 October 2009. Subsequent to this analysis, KPMG were advised by Aviva of some changes to the data used in KPMG's calculation of the adjustments leading to a reduction in the overall adjustments to £174 million as at 31 May 2009 rolled forward to £176 million as at 1 October 2009. The effect of these changes was to reduce the potential special distributions to existing policyholders on Aviva's new business assumptions by £10 million to £55 million.

Table 7 Present value of potential future special distributions of excess surplus absent a reattribution, assumed estate value of £1,570 million at 1 October 2009, £ million, figures in brackets indicate comparables using year-end 2006 data

Assumption	Eligible policyholders	Future policyholders	Shareholders	Eligible policyholders' share of distributions to all policyholders
Aviva new business assumptions: 5 per cent per annum increase	155 (197)	1,402 (1,298)	173 (167)	10% (13%)
Alternative new business assumption: 5 per cent per annum decrease	381 (448)	1,176 (1,055)	173 (168)	24% (30%)
Alternative new business assumption: -15 per cent per annum decrease	537 (605)	1,020 (904)	173 (168)	34% (40%)
Alternative new business assumption: 50 per cent of Aviva base case	391	1,165	173	25%

Source: LECG analysis

Note: The adjusted estate value is £1,804 million, including £232 million adjustments at 31 May 2009 as advised by KPMG, rolled forward to £234 million at 1 October 2009.

As is clear from the tables, the value of shareholders' 10 per cent of special distributions is unaffected by the amount of new with-profits business written for any given size of inherited estate. That is because new with-profits business serves to defer, but not dilute, the value of shareholders' distributions; as capital left in the funds generates a return its present value to shareholders will remain the same provided it is discounted at the fund growth rate. The total of the 90 per cent of special distributions paid to all policyholders is also relatively unaffected by the amount of new with-profits business written. Of the total special distributions paid to all policyholders, the share paid to eligible policyholders is radically altered by the amount of new with-profits business assumed to be written, absent a reattribution. Eligible policyholders' share ranges from a 5 per cent share, under Aviva's new business assumptions, to a 31 per cent share, under the policyholder advocate's assumption of 15 per cent per annum

decline in new business and an assumed estate of £1,200 million. At higher estate values eligible policyholders receive a higher proportion of estimated future special distributions, because all things being equal, a higher estate value will result in earlier distributions, when eligible policyholders make up a larger proportion of the funds.

4.03.1. Analysis of changes since year-end 2006 data

Under all new business assumptions included, aggregate future special distributions to eligible policyholders are lower than those based on year-end 2006 data, which were shown in the policyholder advocate's June 2009 report. There are several reasons for this, relating to actual experience during 2007 and 2008 and changes in assumptions about the future. The most significant changes include:

- future lapse assumptions have changed according to Aviva's move to a Market Consistent Embedded Value ("MCEV") basis: in general, lapse assumptions for unitised bonds and pensions have increased, while lapse assumptions for regular endowments have decreased;
- the forecast long-term average after-tax fund rate has decreased from 6.15 per cent per annum to 5.16 per cent per annum.;
- capital requirements now reflect the money-back guarantee rather than the inflation protection guarantee and as a result are lower and do not rise as much with new business in the later years of the projection; and
- the fall in financial markets has reduced asset shares and asset values in comparison with previous projections.

Of these changes, some would serve, all else being equal, to decrease aggregate special distributions to eligible policyholders, while others would counteract this effect. In fact, the analysis demonstrates that the factors serving to decrease special distributions to eligible policyholders outweigh those which would increase those distributions; the primary factors contributing to the decrease in eligible policyholders projected special distributions are:

- a fall in the value of eligible policyholders' asset shares since 2006: the poor performance of the financial markets during 2007 and 2008 has reduced the value of existing business asset shares. However, new business projections have remained the same in nominal terms. Existing business therefore makes up a smaller proportion of total asset shares in force in the future, and so is projected to receive a smaller share of any future special distributions;
- investment returns: all else being equal, the lower fund rate serves to defer distributions. Eligible policyholders make up a smaller proportion of the fund in future years, so delay serves to increase the dilution of special distributions through sharing with future policyholders; and
- lapse assumptions: overall lapse assumptions have decreased and so more eligible policyholders in these groups are projected to stay in the fund for longer thus diluting the potential special distributions to any individual policyholder.

These factors are partially offset by lower capital requirements thus serving to bring distributions forward and increase them.

In sum, the changes resulting from the actual experience in 2007 and 2008 and changes in assumptions about the future combine to reduce projected special distributions to eligible policyholders in comparison with LECG's estimates based on year-end 2006 data. The tables below summarise the changes in estimated special distributions to eligible policyholders between the two sets of analysis.

Table 8 Present value of potential future distributions of excess surplus absent a reattribution using year-end 2006 data and year-end 2008 data, Aviva new business assumptions, valued at 1 October 2009

1 October 2009 assumed estate value	Potential future special distributions to eligible policyholders		
	Year-end 2006 data	Year-end 2008 data	Change
£1,200m	£83m	£65m	- £18m
£1,570m	£197m	£155m	-£42m

Source: LECG analysis, based on KPMG adjustments of £234 million

Table 9 Present value of potential future distributions of excess surplus absent a reattribution using year-end 2006 data and year-end 2008 data, policyholder advocate's alternative assumption of 5 per cent per annum declines in new business from 2011, valued at 1 October 2009

1 October 2009 assumed estate value	Potential future special distributions to eligible policyholders		
	Year-end 2006 data	Year-end 2008 data	Change
£1,200m	£292m	£243m	-£49m
£1,570m	£448m	£381m	-£67m

Source: LECG analysis, based on KPMG adjustments of £234 million

Table 10 Present value of potential future distributions of excess surplus absent a reattribution using year-end 2006 data and year-end 2008 data, policyholder advocate's alternative assumption of 15 per cent per annum declines in new business from 2011, valued at 1 October 2009

1 October 2009 assumed estate value	Potential future special distributions to eligible policyholders		
	Year-end 2006 data	Year-end 2008 data	Change
£1,200m	£431m	£376m	-£55m
£1,570m	£605m	£537m	-£68m

Source: LECG analysis, based on KPMG adjustments of £234 million

4.04 Evaluation of the aggregate PIP offer

This section reviews, LECG's analysis assessing whether eligible policyholders receive at least a 50 per cent share of the policyholder advocate's estimate of the residual value of the inherited estates (as detailed in Appendix 37 to the policyholder advocate's June 2009 report) under Aviva's new business assumptions.

LECG's analysis of Aviva shareholders' IRR from the reattribution transaction is also summarised.

To allow conclusions regarding the aggregate offer to be reached, all of the analysis in this section assumes that 100 per cent of eligible policyholders accept the Aviva offer.

4.04.1. Eligible policyholders' aggregate special distributions

The estimated potential future special distributions to eligible policyholders absent a reattribution were described in Section 4.03. In the analysis undertaken using year-end 2006 data, in all cases Aviva's aggregate PIP offer exceeded these estimated special distributions. Using the year-end 2008 data, as Table 11 shows, at all estate values and new business assumptions considered, Aviva's aggregate PIP offer still exceeds estimated future special distributions to eligible policyholders. Therefore, the policyholder advocate's first criterion⁹ is satisfied. As stated above adjusting the £1,200 million estate by £176 million rather than £234 million serves to reduce the estimated potential special distributions to eligible policyholders assuming Aviva's new business assumptions. This effect would hold true across all the other estate and new business assumptions and therefore the lower adjustment does not mean any changes are required to our conclusions.

⁹ That, in aggregate, eligible policyholders receive a PIP that is at least equal to their estimated potential special distributions across a range of new business assumptions and estate values.

Table 11 Aggregate special distributions to eligible policyholders compared to Aviva's aggregate PIP offer

1 October 2009 assumed estate value	Aggregate PIP	Aggregate potential future special distributions to eligible policyholders		
		Aviva new business assumptions: 5 per cent per annum increase	Policyholder advocate's alternative new business assumption: 5 per cent per annum decrease	Policyholder advocate's alternative new business assumption: 15 per cent per annum decrease
£1,200 m	£500m	£65m	£243m	£376m
£1,570m	£704m	£155m	£381m	£537m

Source: LECG analysis, based on KPMG adjustments of £234 million

4.04.2. Eligible policyholders' share of the residual estate value

A specific issue that arises in a reattribution is that, because of the FSA rule that allows inherited estate capital to be used to support new with-profits business, the estate that would otherwise go to future policyholders may instead be transferred to shareholders. The FSA has said that in a reattribution, compensation to eligible policyholders for giving up their rights to future special distributions from the inherited estate should include some payment for any estate that, without a reattribution, would have been distributed to future policyholders. The policyholder advocate and her advisers have therefore estimated the 'residual value' of future policyholders' share of the inherited estates, which represents the portion of the inherited estate that may have been distributed to future policyholders, less relevant costs and risks associated with the reattribution.

Appendix 37 to the policyholder advocate's June 2009 report described the policyholder advocate's approach to valuing the residual inherited estate in the context of the proposed reattribution, which includes making allowance for costs and risks that are currently charged to the inherited estates under current FSA rules and which, following the reattribution, will instead be borne by shareholders. An allowance also needs to be made for the one-off costs associated with the reattribution.

The calculation of the residual inherited estate and the division between eligible policyholders and shareholders, under Aviva new business assumptions, is shown in the tables below.

Table 12 Residual value of the inherited estates, Aviva new business assumptions

1 October 2009 estate value	£1,200m	£1,570m
KPMG adjustments	£234m	£234m
Adjusted estate value	£1,434m	£1,804m
Costs, risks and tax	£491m	£567m
Value after reattribution costs, taxes & allowances	£943m	£1,237m
Shareholders' future distributions from whole estate	£137m	£173m
Eligible policyholders' expected future special distributions	£65m	£155m
Residual estate value after all distributions, costs & allowances	£742m	£909m

Source: LECG analysis and KPMG adjustments

As Table 12 above indicates, the residual value of the estate is larger at higher estate values. In a reattribution, the value of the estate after costs, taxes and allowances is split between eligible policyholders and shareholders. The aggregate PIP will provide eligible policyholders with all of their potential future special distributions, plus a share of the residual value of the estate. Eligible policyholders' share of the residual estate is therefore calculated as the PIP minus projected future special distributions. The split of the residual estate value under Aviva's new business assumptions is shown in Table 13 below.

Table 13 Division of the residual value of the inherited estates, Aviva new business assumptions

1 October 2009 assumed estate value	£1,200m	£1,570m
Value after reattribution costs, taxes & allowances	£943m	£1,237m
Eligible policyholders		
Share of policyholders' expected future special distributions	100% £65m	100% £155m
Share of the residual estate value	59% £435m	60% £548m
Total to eligible policyholders (Aggregate PIP)	£500m	£704m
Shareholders		
Share of shareholders' expected future special distributions	100% £137m	100% £173m
Share of the residual estate value	41% £307m	40% £361m
Total to shareholders	£443m	£534m

Source: LECG analysis, based on KPMG adjustments of £234 million

As the table shows, eligible policyholders are projected to receive all of their projected special distributions, plus between 59 and 60 per cent of the residual value of the estate under Aviva new business assumptions. With the lower level of KPMG's adjustments, the percentage becomes 63. Therefore, the policyholder advocate's second criterion¹⁰ is satisfied.

Aviva notified KPMG of a late change to its analysis that would reduce their adjustments to £176 million rather than £234 million. As stated above, this serves to reduce the estimated potential special distributions to eligible policyholders assuming Aviva's new business assumptions. As a result, the nominal share of the residual estate value received by eligible policyholders, increases to £445 million for an assumed estate value of £1,200 million, under

¹⁰ That eligible policyholders receive at least a 50% share of the PA's estimate of the residual value of the inherited estates under Aviva new business assumptions.

Aviva new business assumptions, corresponding to a percentage share of the residual value of 63%. This effect would hold true across all the other estate levels and therefore, the policyholder advocate's second criterion continues to be satisfied.

In the policyholder advocate's June 2009 report, eligible policyholders' share of the residual estate under Aviva new business assumptions was estimated to be 60 per cent with an assumed estate value of £1,200 million and 61 per cent with an assumed estate value of £1,570 million. Eligible policyholders' potential future special distributions are projected to be lower using the year-end 2008 data than they were using the end-2006 data, so eligible policyholders' share, in nominal terms, of residual estate value is higher. In percentage terms however, that nominal increase is outweighed by the increase in the residual value of the estate due to the increase in KPMG adjustments from £185 million to £234 million at the effective date.

At lower levels of new business, potential future special distributions to eligible policyholders are higher, so their share of residual estate value is lower. The tables below show the split of residual estate value under alternative new business assumptions. At these lower new business levels, the decrease in special distributions in comparison with the analysis contained in the policyholder advocate's June 2009 report is enough to outweigh the effect of the higher residual estate value due to the higher KPMG adjustments; as a result, eligible policyholders' share of residual estate value is projected to be higher than that which was calculated using year-end 2006 data, by up to 8 per cent in the policyholder advocate's alternative assumption with 15 per cent per annum declines in new business and an assumed estate value of £1,570 million.

Table 14 Residual value of the inherited estates, policyholder advocate’s alternative assumptions of 5 per cent per annum decline in new business

1 October 2009 assumed estate value	£1,200m	£1,570m
KPMG adjustments	£234m	£234m
Adjusted estate value	£1,434m	£1,804m
Costs, risks and tax	£480m	£554m
Value after reattribution costs, taxes & allowances	£954m	£1,250m
Shareholders’ future distributions from whole estate	£137m	£173m
Eligible policyholders’ expected future special distributions	£243m	£381m
Residual estate value after all distributions, costs & allowances	£574m	£696m

Source: LECG analysis and KPMG adjustments

Table 15 Division of the residual value of the inherited estates, policyholder advocate’s alternative assumptions of 5 per cent per annum decline in new business

1 October 2009 assumed estate value	£1,200m	£1,570m
Value after reattribution costs, taxes & allowances	£574m	£696m
Eligible Policyholders		
Share of policyholders’ expected future special distributions	100% £243m	100% £381m
Share of the residual estate value	45% £257m	46% £323m
Total to eligible policyholders (Aggregate PIP)	£500m	£704m
Shareholders		
Share of shareholders’ expected future special distributions	100% £137m	100% £173m
Share of the residual estate value	55% £318m	54% £374m
Total to shareholders	£454m	£547m

Source: LECG analysis, based on KPMG adjustments of £234 million

Table 16 Residual value of the inherited estates, policyholder advocate’s alternative assumptions of 15 per cent per annum decline in new business

1 October 2009 assumed estate value	£1,200m	£1,570m
KPMG adjustments	£234m	£234m
Adjusted estate value	£1,434m	£1,804m
Costs, risks and tax	£474m	£546m
Value after reattribution costs, taxes & allowances	£961m	£1,258m
Shareholders’ future distributions from whole estate	£137m	£173m
Eligible policyholders’ expected future special distributions	£376m	£537m
Residual estate value after all distributions, costs & allowances	£448m	£549m

Source: LECG analysis and KPMG adjustments

Table 17 Division of the residual value of the inherited estates, policyholder advocate’s alternative assumptions of 15 per cent per annum decline in new business

1 October 2009 assumed estate value	£1,200m	£1,570m
Value after reattribution costs, taxes & allowances	£448m	£549m
Eligible policyholders		
Share of policyholders’ expected future special distributions	100% £376m	100% £537m
Share of the residual estate value	28% £124m	30% £167m
Total to eligible policyholders (Aggregate PIP)	£500m	£704m
Shareholders		
Share of shareholders’ expected future special distributions	100% £137m	100% £173m
Share of the residual estate value	72% £324m	70% £382m
Total to shareholders	£461m	£555m

Source: LECG analysis, based on KPMG adjustments of £234 million

In addition, the tables below show the split of the residual estate value under the new business assumption based on 2009 actual new business experience which is 50 per cent of Aviva's new business assumptions in 2009 and 5 per cent annual increases thereafter. In this case, the eligible policyholders' share of the residual estate value is 46 per cent with both assumed estate values of £1,200 million and £1,570 million, this is a similar proportion to in the case with 5 per cent per annum declines in new business. There are no comparable figures from the June 2009 report as analysis for this case was not carried out with year-end 2006 data.

Table 18 Residual value of the inherited estates, 2009 actual new business experience

1 October 2009 assumed estate value	£1,200m	£1,570m
KPMG adjustments	£234m	£234m
Adjusted estate value	£1,434m	£1,804m
Costs, risks and tax	£481m	£555m
Value after reattribution costs, taxes & allowances	£954m	£1,250m
Shareholders' future distributions from whole estate	£137m	£173m
Eligible policyholders' expected future special distributions	£225m	£391m
Residual estate value after all distributions, costs & allowances	£592m	£685m

Source: LECG analysis and KPMG adjustments

Table 19 Division of the residual value of the inherited estates, 2009 actual new business experience

1 October 2009 assumed estate value	£1,200m	£1,570m
Value after reattribution costs, taxes & allowances	£592m	£685m
Eligible policyholders		
Share of policyholders' expected future special distributions	100% £225m	100% £391m
Share of the residual estate value	46% £275m	46% £312m
Total to eligible policyholders (Aggregate PIP)	£500m	£704m
Shareholders		
Share of shareholders' expected future special distributions	100% £137m	100% £173m
Share of the residual estate value	54% £317m	54% £373m
Total to shareholders	£454m	£546m

Source: LECG analysis, based on KPMG adjustments of £234 million

Table 20 below summarises the change in eligible policyholders' share of residual estate value between the year-end 2006 data and the year-end 2008 data.

Table 20 Eligible policyholders' share of residual estate value, figures in brackets are year-end 2006 comparables

Scenarios	1 October 2009 assumed estate value	
	£1,200m	£1,570m
Aviva new business assumptions: 5 per cent per annum increase after 2010	59% (60%)	60% (61%)
Policyholder advocate's alternative new business assumptions: 5 per cent per annum decrease after 2010	45% (43%)	46% (43%)
Policyholder advocate's alternative new business assumptions: 15 per cent per annum decrease after 2010	28% (19%)	30% (22%)
Policyholder advocate's alternative new business assumptions: 2009 actual experience	46%	46%

Source: LECG analysis, based on KPMG adjustments of £234 million

4.04.3. Shareholder rates of return

The policyholder advocate has asked LECG to estimate the IRR to shareholders implicit in Aviva's offer to policyholders. LECG has also assessed the PIP offers that Aviva would need to make to achieve a range of alternative rates of return for shareholders. The results of that analysis are shown in Table 21 below.

Table 21 Implied PIP offers (net of costs) consistent with different shareholder rates of return, calculated based on a PIP at 1 October 2009, £ million

1 October 2009 assumed estate value	PIP	Net fund rate (5.16%)	7%	8%	9%	10%	11%	12%	IRR with Aviva PIP offer
£1,200m	£500m	£930m	£712m	£616m	£533m	£461m	£398m	£343m	9.4%
£1,570m	£704m	£1,195m	£953m	£845m	£750m	£667m	£593m	£528m	9.5%

Source: LECG analysis, based on KPMG adjustments of £234 million

As shown in the table above, if shareholders were to earn the same rate of return on the reattribution as the expected return on investments in the fund, net of tax, Aviva would need to offer a PIP of £930 million under Aviva's new business assumptions with an assumed

estate value of £1,200 million. With a higher assumed estate value of £1,570 million, Aviva would need to offer a higher PIP of £1,195 million if shareholders were to still earn the same IRR as the net return on the fund.

In the policyholder advocate's June 2009 report the PIP that Aviva would need to offer to earn the same return for shareholders as the net return on the fund is £837 million under Aviva's new business assumptions with an assumed estate value of £1,200 million. With a higher assumed estate value of £1,570 million, Aviva would need to offer a higher PIP of £1,108 million if shareholders were to still earn the same IRR as the net return on the fund.

The reason that Aviva's PIP offer to earn the same IRR to shareholders as the net return on the fund is higher compared with the June 2009 report, despite lower cash flows to shareholders, is that the expected net return on the fund, used to discount the cash flows, is lower, averaging 5.16 per cent per annum in the year-end 2008 data compared to an average of 6.15 per cent per annum in the year-end 2006 data.

LECG has also calculated that the IRR for shareholders from the reattribution is 9.4 per cent with an estate value of £1,200 million rising to 9.5 per cent with an estate value of £1,570 million. Performing the IRR calculation again under KPMG's lower adjustments of £176 million yields an IRR for shareholders from the reattribution of 9.0 per cent with an estate value of £1,200 million.

In the policyholder advocate's June 2009 report, the IRR to shareholders was 10.3 per cent with an estate value of £1,200 million and 10.6 per cent with an estate value of £1,570 million. The main reason for the decrease in the IRR to shareholders is the decrease in the expected net return on the fund.

Professor Brealey has advised in his note attached to Appendix 37 of the policyholder advocate's June 2009 report, that any return above the rate of return on the fund should be considered as "profit" from the reattribution. Therefore, with a fund rate after tax of 5.2 per cent, this implies profit from the reattribution of 3.8 per cent, based on a shareholder IRR of 9.0 per cent as calculated by LECG. The fact that the estimated shareholder IRR has

decreased by less than the fund rate implies an increase in the proportional profit to shareholders from the reattribution. Based on the 13.5 per cent IRR provided to analysts by Aviva in May 2009, profit from the reattribution is 8.3 per cent when compared with the fund rate.

As was outlined in the June 2009 report, Aviva has performed its own assessment of the rate of return to shareholders of the reattribution, on the basis of which they estimated a rate of return of 8.2 per cent with an estate value of £1,200 million and 9.1 per cent with an estate value of £1,600 million, approximately equal to an estate value of £1,570 million. Aviva uses a different method for calculating the rate of the return on the transaction, so Aviva's figure is not comparable to LECG's estimate of the IRR using the standard methodology. Aviva has not provided an updated estimate of the rate of return for the reattribution since the June 2009 report despite providing year-end 2008 data. In a subsequent presentation to analysts, Aviva quoted an IRR to shareholders of 13.5 per cent from the reattribution. As discussed in Section 3, LECG have not been able to reconcile this rate of return with LECG's own estimate or Aviva's earlier estimate of the rate of return to shareholders from the reattribution.

4.05 Allocation of the aggregate PIP

In the policyholder advocate's June 2009 report, LECG carried out analysis comparing the PIP allocation for individual eligible policies to the value of their potential future special distributions across a range of estate values and new business assumptions. We have carried out the same analysis using year-end 2008 data for assumed estate values of £1,200 million and £1,570 million under various new business assumptions. The results of this analysis are shown in Table 22 below with figures for year-end 2006 data in brackets.

Table 22 Aggregate results of allocation analysis, figures for year-end 2006 comparables are shown in brackets

1 October 2009 assumed estate value	Aviva's new business assumptions: 5 per cent per annum increase. from 2011		Alternative new business assumption: 5 per cent per annum decrease from 2011		Alternative new business assumption: 15 per cent per annum decrease from 2011		Alternative new business assumption: 2009 actual new experience	
	Special distributions > PIP allocation	PIP allocation > special distributions	Special distributions > PIP allocation	PIP allocation > special distributions	Special distributions > PIP allocation	PIP allocation > special distributions	Special distributions > PIP allocation	PIP allocation > special distributions
£1,200m	4.1% (3.4%)	95.9% (96.6%)	12.7% (10.6%)	87.3% (89.4%)	17.0% (13.2%)	83.0% (86.8%)	13.3%	86.7%
£1,570m	7.3% (6.5%)	92.7% (93.5%)	16.7% (13.2%)	83.3% (86.8%)	20.7% (17.3%)	79.3% (82.7%)	18.8%	81.2%

Source: LECG analysis, based on KPMG adjustments of £234 million

The table above illustrates that:

- under Aviva's new business assumptions, 96 per cent of policyholders with an assumed estate value of £1,200 million and 93 per cent of policyholders with an assumed estate value of £1,570 million are offered a PIP allocation greater than potential future special distributions. The proportion of policyholders with a PIP offer greater than potential future special distributions is slightly lower in the year-end 2008 data compared with the year-end 2006 data, by less than 1 per cent for both estate values;
- under the policyholder advocate's alternative assumption of 5 per cent per annum declines in new business, 87 per cent of policyholders with an assumed estate value of £1,200 million and 83 per cent of policyholders with an assumed estate value of £1,570 million are offered a PIP allocation greater than potential future special distributions. The proportion of policyholders with a PIP offer greater than potential future special distributions is slightly lower in the year-end 2008 data compared with the year-end 2006 data, by less than 4 per cent for both assumed estate values;

- under the policyholder advocate's alternative assumption of 15 per cent per annum declines in new business, 83 per cent of policyholders with an assumed estate value of £1,200 million and 79 per cent of policyholders with an assumed estate value of £1,570 million are offered a PIP allocation greater than potential future special distributions. The proportion of policyholders with a PIP offer greater than potential future special distributions is slightly lower in the year-end 2008 data compared with the year-end 2006 data, by less than 4 per cent for both estate values; and
- under the policyholder advocate's alternative assumption based on 2009 actual new business experience with 50 per cent of Aviva's assumptions in 2009 and annual increases of 5 per cent thereafter, 87 per cent of policyholders with an assumed estate value of £1,200 million and 81 per cent of policyholders with an assumed estate value of £1,570 million are offered a PIP allocation greater than potential future special distributions. This new business scenario was not considered in the June 2009 report. The results for this new business scenario are approximately in line with the policyholder advocate's other alternative scenarios with 5 per cent per annum and 15 per cent per annum declines in new business.

Factors identified earlier in this section, such as the fall in the value of eligible policyholders' asset shares, lower investment returns and changes in lapse assumptions, have caused the small decrease in proportions of policyholders with PIP allocations greater than potential future special distributions in all the cases considered.

Using the revised KPMG adjustments, under Aviva's new business assumptions, with an assumed estate value of £1,200 million, the proportion of policyholders with a PIP offer greater than potential future special distributions returns to 96.6 per cent; the same as for the year-end 2006 data. This effect would hold true across all the other estate and new business assumptions and therefore the lower adjustment does not mean any changes are required to our conclusions.

5.00 Revised guidance to policyholders

5.01 Introduction

As stated in the June 2009 report, the policyholder advocate's role involves providing guidance for groups of with-profits policyholders with reasons as to whether Aviva's proposals are in their interests. This guidance was provided to eligible policyholders in the "Making your choice booklet" prepared by the policyholder advocate.

In this section, LECG has provided an update, using year-end 2008 data, to Appendix 45 of the policyholder advocate's June 2009 report which assisted policyholders in assessing whether Aviva's PIP offer is likely to exceed the value of potential future special distributions which policyholders who elect for the reattribution will forgo.

The key objective of this section is to assess whether guidance needs to be re-issued to particular groups of policyholders.

5.02 Individual policy characteristics and potential future special distributions forgone

Using the year-end 2008 data, LECG has analysed one of the policyholder advocate's four criteria as to whether eligible policyholders receive a PIP offer that is at least equal to their estimated future special distributions across a range of new business assumptions and estate values. The same analysis was carried out previously with the year-end 2006 data.

As stated in the policyholder advocate's June 2009 report, it is not possible to estimate precise values for individual policyholders' interests in the potential future special distributions from the inherited estates due to uncertainty about:

- future investment returns;
- future new business supported by the estate capital; and
- the future circumstances and intentions of individual policyholders.

However, it is possible to say that future special distributions are correlated with:

- the type of policy held;
- the outstanding term of the policy; and
- the size of the policy.

It is therefore possible to group policies by type and outstanding term in order to provide an indication as to when, if at all, potential future special distributions will exceed the PIP offer. Policies are not grouped by size because larger policies will simply, pro-rata, receive larger future special distributions from the inherited estates. The same groupings that are included in the policyholder advocate's guidance booklet and the June 2009 report have been analysed in this annexe.

Table 23 Policyholder groups

Policyholder group	Premium type	Maturity or expected surrender date
1	Regular	Up to and including 2016
2	Single	No fixed maturity date
3	Regular	Between 2017 and 2021
4	Regular	Beyond 2021

Source: Groups as assigned by LECG.

For each of the four policy types, LECG has analysed the potential outcomes using ten cases corresponding to different post-retribution outcomes. The ten cases include the four different assumptions about levels of new business described in Section 4 at the two assumed estate values as at 1 October 2009 previously mentioned, as well as an additional policyholder advocate assumption in which special distributions are increased by 25 per cent each year and Aviva's new business assumptions are used. All these cases, except the one based on 2009 actual new business experience, were included in the June 2009 report. Guidance is offered for each of the four groups of policyholders for all ten cases and compared to the guidance provided in the June 2009 report.

LECG emphasises that the figures provided in the guidance to policyholders are indicative only, providing an illustration of when potential future special distributions are likely to equal Aviva's PIP offer under different assumptions. Factors influencing potential future special distributions such as investment returns and the level of new business are highly uncertain.

5.02.1. Regular premium policies maturing or surrendered before 2017

Based on LECG's analysis using year-end 2008 data, all policyholders with regular premium policies maturing or being surrendered before 2017 should accept Aviva's offer.

Table 24 below illustrates the guidance for policyholders in this group. Figures in brackets are comparables using year-end 2006 data which appeared in the June 2009 report.

Table 24 Years in which potential future special distributions may exceed PIP offers on average, regular premium policies maturing before 31 December 2016, figures in brackets are comparables using year-end 2006 data

1 October 2009 assumed estate value	Aggregate PIP offer	Aviva's new business assumptions: 5 per cent per annum increase from 2011	Policyholder advocate's alternative new business assumptions:			
			5 per cent per annum decline from 2011	15 per cent per annum decline from 2011	2009 new business experience	Aviva's new business assumptions with 25 per cent higher special distributions
£1,200m	£500m	Never (Never)	Never (Never)	Never (Never)	Never	Never (Never)
£1,570m	£704m	Never (Never)	Never (Never)	Never (Never)	Never	Never (Never)

Source: LECG analysis, based on KPMG adjustments of £234 million

According to Aviva, it is almost certain that there will be no special distributions before 2012; LECG broadly agrees with this view. Therefore, the value of potential future special distributions forgone by policies leaving the fund before 2012 is likely to be zero under all new business scenarios and estate values considered. In addition, any special distributions before 2016 are likely to be small compared to the PIP offer.

The same results were found for this group of policyholders using the year-end 2006 data.

Under the lower KPMG adjustments of £174 million as at 31 May 2009 rolled forward to £176 million as at 1 October 2009, and assuming Aviva new business assumptions for an assumed estate value of £1,200 million, Aviva's PIP offer continues to exceed the estimated potential future special distributions for an average eligible policyholder in policyholder group 1. LECG believes that across all the scenarios considered here and at estate levels of either £1,200 million or £1,570 million, the use of the lower level of KPMG adjustments would not lead to any significant change in the years (quoted in Table 24 above) when future special distributions are expected to exceed the PIP offer.

5.02.2. Single premium policies with no maturity date

Policyholders with single premium policies that have no maturity date face a more finely balanced decision. The length of time that policyholders in this group intend to remain invested in the funds determines whether potential future special distributions are likely to exceed the PIP offer.

Table 25 below illustrates the guidance for policyholders in this group.

Table 25 Years in which potential future special distributions may exceed PIP offers on average, single premium policies, figures in brackets are comparables using year-end 2006 data

1 October 2009 assumed estate value	Aggregate PIP offer	Aviva's new business assumptions: 5 per cent per annum increase from 2011	Policyholder advocate's alternative new business assumptions:			
			5 per cent per annum decline from 2011	15 per cent per annum decline from 2011	2009 new business experience	Aviva's new business assumptions with 25 per cent higher special distributions
£1,200m	£500m	2025 (2024)	2020 (2019)	2019 (2018)	2019	2024 (2023)
£1,570m	£704m	2022 (2020)	2018 (2017)	2017 (2017)	2017	2021 (2019)

Source: LECG analysis, based on KPMG adjustments of £234 million

As is shown in the table above, on average, the present value of cumulative special distributions is estimated to exceed the PIP offer in all scenarios under consideration. Using Aviva's new business assumption with an assumed estate value of £1,200 million, potential future special distributions are estimated to exceed the PIP offer by 2025, using year-end 2008 data. Under the policyholder advocate's alternative assumption of a 15 per cent per annum decrease in new business with an assumed estate value of £1,200 million, the earliest year in which future special distributions are estimated to exceed the PIP offer is 2019.

Under the assumption with 25 per cent higher potential future special distributions the year when future special distributions are expected to first exceed the PIP offer is only one year closer than under Aviva's new business assumption with an assumed estate value of £1,200 million.

Under the assumption based on 2009 actual new business experience, potential future special distributions are expected to first exceed the PIP offer in the same year as in the 15 per cent per annum decline in new business scenario with an assumed estate value of £1,200 million.

This is equal to the earliest year when future special distributions are expected to exceed the PIP offer under all other assumptions.

In comparison to the guidance with year-end 2006 data, the years when potential future special distributions are expected to first exceed the PIP offer have not changed significantly, moving out by up to 1 year. The earliest year when future special distributions are expected to exceed the PIP offer has moved out by 1 year from 2017 in the year-end 2008 data to 2018 in the year-end 2006 data in the scenario with a 15 per cent per annum decline in new business, for an assumed estate value of £1,200 million.

Under the lower KPMG adjustments of £174 million as at 31 May 2009 rolled forward to £176 million as at 1 October 2009, and assuming Aviva new business assumptions for an assumed estate value of £1,200 million, the break-even year when potential future special distributions are expected to first exceed the PIP offer has not changed significantly, moving out by 1 extra year, to 2026. LECG believes that across all the scenarios considered here and at estate levels of either £1,200 million or £1,570 million, the use of the lower level of KPMG adjustments would not lead to any significant change in the years (quoted in Table 25 above) when future special distributions are expected to exceed the PIP offer

5.02.3. Regular premium policies maturing or surrendered between 2017 and 2021

Policyholders with regular premium policies which will mature or be surrendered between 2017 and 2021 are more likely to receive special distributions with a cumulative present value greater than the PIP offer compared to policyholders with regular premium policies maturing before 2017.

Table 26 below illustrates the guidance for policyholders in this group.

Table 26 Years in which potential future special distributions may exceed PIP offers on average, regular premium policies maturing between 1 January 2017 and 31 December 2021, figures in brackets are comparables using year-end 2006 data

1 October 2009 assumed estate value	Aggregate PIP offer	Aviva's new business assumptions: 5 per cent per annum increase from 2011	Policyholder advocate's alternative new business assumptions:			
			5 per cent per annum decline from 2011	15 per cent per annum decline from 2011	2009 new business experience	Aviva's new business assumptions with 25 per cent higher special distributions
£1,200m	£500m	Never (Never)	Never (Never)	2019 (2019)	Never	Never (Never)
£1,570m	£704m	Never (Never)	2019 (2018)	2018 (2017)	2018	Never (Never)

Source: LECG analysis, based on KPMG adjustments of £234 million

As is shown in the table above, and similarly to the analysis using year-end 2006 data, under Aviva's new business assumptions of 5 per cent per annum increases in new business, future special distributions are not expected to exceed the PIP offer at either of the estate values under consideration using year-end 2008 data.

The earliest year in which future special distributions are expected to exceed the PIP offer is 2019 with an assumed estate value of £1,200 million under the policyholder advocate's assumption of 15 per cent per annum declines in new business.

In the assumption based on 2009 actual new business experience, future special distributions are not expected to exceed the PIP offer with an assumed estate value of £1,200 million.

Under the assumption of 25 per cent higher future special distributions, the present value of cumulative distributions is not expected to exceed the PIP offer.

Comparing the year-end 2006 data with the year-end 2008 data, the earliest years when cumulative special distributions are at least equal to the PIP offer have not changed.

Under the lower KPMG adjustments of £174 million as at 31 May 2009 rolled forward to £176 million as at 1 October 2009, and assuming Aviva new business assumptions for an assumed estate value of £1,200 million, the break-even year when potential future special distributions are expected to first exceed the PIP offer has not changed. LECG believes that across all the scenarios considered here and at estate levels of either £1,200 million or £1,570 million, the use of the lower level of KPMG adjustments would not lead to any significant change in the years (quoted in Table 26 above) when future special distributions are expected to exceed the PIP offer.

5.02.4. Regular premium policies remaining in the funds beyond 2021

Consistent with the guidance provided in the EMP, policyholders with regular premium policies which will mature or be surrendered after 2021 are the group with the most difficult decision in the EMP. The longer period to maturity means that policyholders who are willing to remain in the funds will have a higher probability of receiving special distributions and therefore a higher probability that these estimated potential future special distributions could exceed the PIP they have been offered.

Table 27 below illustrates the guidance for policyholders in this group.

Table 27 Years in which potential future special distributions may exceed PIP offers on average, regular premium policies maturing after 1 January 2021, figures in brackets are comparables using year-end 2006 data

1 October 2009 assumed estate value	Aggregate PIP offer	Aviva's new business assumptions: 5 per cent per annum increase from 2011	Policyholder advocate's alternative new business assumptions:			
			5 per cent per annum decline from 2011	15 per cent per annum decline from 2011	2009 new business experience scenario	Aviva's new business assumptions with 25 per cent higher special distributions
£1,200m	£500m	Never (2028)	2021 (2019)	2019 (2018)	2020	2028 (2025)
£1,570m	£704m	2026 (2021)	2019 (2018)	2018 (2017)	2019	2023 (2020)

Source: LECG analysis, based on KPMG adjustments of £234 million

As the table above shows, on average, policyholders in this group are likely to receive future special distributions which exceed the PIP offer under all except one of the scenarios considered. Under Aviva's new business assumptions with an assumed estate value of £1,200 million, future special distributions are not expected to exceed the PIP offer, whereas previously, using year-end 2006 data average eligible policyholders who are in-force within this group were expected to breakeven in 2028.

The earliest year in which future special distributions are expected to exceed the PIP offer are 2019 with an assumed estate value of £1,200 million under the assumption that new business declines by 15 per cent per annum.

Under the lower KPMG adjustments of £174 million as at 31 May 2009 rolled forward to £176 million as at 1 October 2009, and assuming Aviva new business assumptions for an assumed estate value of £1,200 million, the break-even year when potential future special distributions are expected to first exceed the PIP offer has not changed. LECG believes that across all the scenarios considered here and at estate levels of either £1,200 million or £1,570 million, the use of the lower level of KPMG adjustments would not lead to any significant

change in the years (quoted in Table 27 above) when future special distributions are expected to exceed the PIP offer.

Under the assumption that special distributions are 25 per cent higher, future special distributions are expected to first exceed the PIP offer in 2028 with an assumed estate value of £1,200 million.

Under the assumption based on 2009 actual new business experience, the year when the present value of cumulative special distributions is estimated to exceed the PIP offer is 2020 with an assumed estate value of £1,200 million, similar to the assumption of a 5 per cent per annum decrease in new business.

Comparing these results with the guidance from the year-end 2006 data, as previously discussed, under Aviva's new business assumptions the year when future special distributions are expected to exceed the PIP offer has changed from 2028 to 'never' with an assumed estate value of £1,200. In Aviva's new business scenario with 25 per cent higher special distributions, the year where future special distributions are expected to exceed the PIP offer has moved three years further out.

These changes in the break-even periods are not considered to be material. Potential future special distributions towards the end of the period are estimated to be small and special distributions are expected to become smaller year-on-year, meaning that small changes in assumptions can cause significant changes in the length of the break-even periods.

The years when the present value of cumulative special distributions is expected to exceed the PIP offer has changed less significantly under other new business scenarios, by up to 2 years, between the year-end 2006 data and the year-end 2008 data.

Therefore, the most significant change in the analysis has been in relation to guidance assuming an estate of £1.2 billion and Aviva's new business. Consequently, consideration needs to be given as to whether guidance is re-issued to policyholders with policies that will mature or be surrendered after 2021. In assessing whether guidance should be re-issued the volatility and materiality of these results needs to be considered. We note that expected

special distributions are small towards the end of the modelling (25 year) period and year-on-year special distributions get smaller over time, so small changes in the PIP can shift the break-even years significantly. For instance, we estimate special distributions to an average policyholder in group 4 to increase only by £17 between 2030 and 2031; £12 between 2031 and 2032; and £6 between 2032 and 2033.

We consider the volatility of estimating breakeven points for policyholder group 4 below.

5.02.5. Higher investment returns sensitivity analysis

Assumed investment returns, after tax, in the 2008 data average 5.16 per cent compared to 6.15 per cent in the 2006 data. In order to assess the impact of lower investment returns on the guidance, LECG has carried out the same analysis (for an assumed estate of £1.2 billion and Aviva's new business assumptions) using an alternative data set provided by Aviva with 0.5 per cent higher investment returns.

The guidance for policyholder groups 1, 2 and 3, with regular premium policies maturing before 2022 and single premium policies with no maturity date, has not changed significantly. The years when cumulative special distributions are expected to first exceed the PIP offer have changed by a maximum of one year for these three groups of policyholders.

The most significant impact of this sensitivity analysis occurs for policyholder group 4. In Table 27 we show that using year-end 2008 data estimated future special distributions for in-force policyholders in this group will never exceed the PIP, under Aviva new business assumptions for an assumed estate value of £1,200 million, whereas previously (using year-end 2006 data) the breakeven point was 2028. Applying the investment returns sensitivity means that policyholders in this group are estimated to breakeven in 2030. Therefore, it is clear that small changes to assumptions around investment returns can have a significant impact on estimated breakeven points for policyholders who expect to mature or surrender beyond 2021.

5.03 Conclusions

This section provides an update to the guidance for one of the policyholder advocate's four criteria to assess whether the reattribution of the inherited estates is in the interests of policyholders. In order to undertake this analysis, policyholders have been separated into four groups based on outstanding term and type of policy. LECG has analysed whether the present value of cumulative future special distributions is expected to exceed the PIP offer under ten different scenarios. In cases where future special distributions are expected to exceed the PIP offer, LECG has estimated in which year this is likely to occur.

The results of this analysis using year-end 2008 data, for the four groups of policyholders are that, on average:

- regular premium policies maturing or being surrendered before 2017 are unlikely to receive future special distributions that exceed the PIP offer. The guidance for this group of policyholders has not changed from the analysis using year-end 2006 data. Consequently, we do not believe guidance needs to be re-issued to this group of policyholders;
- for single premium policies with no set maturity date, whether or not future special distributions might exceed the PIP offer depends on when policyholders are likely to leave the funds. The guidance for this group of policyholders has not changed significantly from the analysis using year-end 2006 data. Consequently, we do not believe guidance needs to be re-issued to this group of policyholders;
- regular premium policies maturing or being surrendered between 2017 and 2021 might receive future special distributions that exceed the PIP offer in some scenarios, however it is expected to take until at least 2019 with an assumed estate value of £1,200 million and 15 per cent per annum declines in new business. For this group of policyholders the guidance has not changed compared with the analysis using year-end 2006 data. Consequently, we do not believe guidance needs to be re-issued to this group of policyholders; and

- consistent with the policyholder advocate’s guidance booklet, regular premium policies maturing or being surrendered after 2021 are likely to receive future special distributions that exceed the PIP offer (with break even points moving out by up to 5 years) in all but one scenario, the exception being under Aviva’s new business assumption with an assumed estate value of £1,200 million, where previously the guidance issued by the policyholder advocate suggested that estimated special distributions would breakeven by 2028; the new data suggests estimated special distributions will never equal or exceed the PIP offer to an average policyholder in this group. However, as we have shown the incremental estimated distributions for average policies in this group beyond 2021 are relatively immaterial. Additionally, small changes in assumptions can have a significant impact on breakeven points for this group of policyholders. Therefore, due to immaterial differences between distributions in later years and the high degree of volatility around break-even years depending on the assumptions made, we believe it is not necessary to reissue the guidance.

Exhibit A: The Required Long-Term Return on U.K. Equities in December 2008

Professor Richard A. Brealey

This note considers two questions: (1) What was the long-term required return on UK investments at the end of 2008?, (2) How have required returns changed between the end of 2006 and the end of 2008?

My focus in this note is on equity returns. I understand that the NU portfolio has significant holdings of gilts and property. The expected return on long gilts is given by their yields to maturity and I document below the change in these yields between 2006 and 2008. Data on property returns is limited and imperfect, and I have made no attempt to estimate expected property returns. I suspect that one cannot do much better than to assume that net of expenses the expected long-term return from property is similar to that from equities.

The Required Return on UK Equities in December 2008

It is helpful to think of the required return on equities as composed of a risk-free return and a premium for risk. Assuming that the required risk premium is stable, an unbiased estimate is provided by the average premium that equity investors have earned in the past.¹¹ The average realized risk premia since 1900 for the UK, and for a sample of 17 developed markets (the “world”) are summarized in the following table:

¹¹ Note that the very large fluctuations in equity returns make it necessary to average returns over a long period.

Average annual difference between the return on equities and government debt, 1900-2008		
	3-month Treasury bills	Long-term government bonds
UK	6.0%	5.1%
World *	6.9	5.6
* Equally weighted average for 17 countries		
<i>Source:</i> E. Dimson, P.R. Marsh, and M. Staunton		

Thus, on the evidence of past data a reasonable estimate of the expected return on UK equities is in the region of 6-7% above the expected bill rate.¹²

Many arguments have been put forward as to why the required risk premium may have changed over time, so that these past risk premia may be an imperfect guide to the premia that investors require today. I will not rehearse these arguments here. Surveys of financial managers and finance professors have typically suggested slightly lower figures. For example, a survey of U.S. finance professors in January 2009 produced an average estimate of the required risk premium of 6-6.2%, compared with an average realized premium in the United States of 7.1%.¹³

At the end of December 2008 the 3-month bill rate in the UK was 1.24% and the yield on 20-year gilts was 3.91%.¹⁴ This is an unusually steep term structure. Over the past 109 years the return on bills in the UK has averaged about .9% less than that on long gilts. If this is a reasonable guide to the future, it would suggest an expected bill rate averaging about 3%. This seems a reasonable, if somewhat conservative, figure. In the past, investors have earned

¹² The differences between the equity returns of the 17 countries appear to be largely chance differences, so that the best guide to the expected risk premium for any single country is probably the "world" average, i.e., 6.9%.

¹³ Welch, Ivo. "Views of Financial Economists On The Equity Premium And Other Issues," *The Journal of Business* 73-4, October 2000, 501-537, with 2009 update (<http://welch.econ.brown.edu/academics/equpdate-results2009.html>).

¹⁴ Source: Bank of England

an average *real* return on bills of 1.2%. A future bill rate of 3% would provide a similar real return only if inflation averaged 1.8%, slightly below the government's target.

An expected bill rate of 3% and a market risk premium of 6-7% suggest a figure for the expected equity return of between 9% and 9.9%.¹⁵ This return is a gross (pretax) return. If NU is liable to tax at 6.9% on this return, it can expect to earn a net return on its equity investments of .between 8.4% and 9.2%.

I should note in conclusion that these figures are estimates of the expected, or arithmetic average, return. The compound, or geometric average, return is likely to be about 2% lower.

How Have Required Returns Changed since the End of 2006?

I have suggested that the required return on equities is composed of a risk-free interest rate (the expected long-term yield from Treasury bills) plus a risk premium.

In December 2006 the yield in the U.K. on 3-month bills was 5.11% and the yield on 20-year gilts was 4.41%. As noted above, on average since 1900 bills have provided about .9% lower return than long gilts. This implies that in 2006 investors were expecting an average long-term return on bills of 3.5%, about .5% higher than the figure that I proposed for end-2008. However, I suspect that this overstates any likely change in investors' views about the long term level of interest rates. This view partly reflects the general observation that one can learn very little about the long-term levels of economic time-series from short-term movements. Furthermore, while I commented that the 2008 estimate of future bill rates appeared to reflect a slightly low estimate of future inflation, the reverse is true of the 2006 estimate. In sum, I think that it is quite possible that investors have lowered their forecasts of long-term inflation and that this is reflected in lower expectations about future interest rates,¹⁶ but in my judgement a reduction of .5% in the expected level of interest rates is towards the top end of a reasonable estimate.

¹⁵ An equivalent figure would result from adding the historic risk premium over the return on long gilts to the end-year yield on long gilts.

¹⁶ However, the current wide spread between the yield on 20-year nominal and index-linked gilts seems to imply that investors are more concerned about a long-term increase in the inflation rate.

A second possibility is that the expected risk premium changed between the end of 2006 and 2008. The risk premium that investors demand is likely to be related to market volatility. Since markets were unusually volatile in 2008, it has been suggested that the risk premium should be adjusted upward.¹⁷ I do not believe that this would be appropriate for any long-term forecast. It is certainly the case that markets have been volatile. The VIX Index of U.S. market volatility touched 80% in November 2008 and closed the year at 40%. The latter figure was about twice the long-term average for U.S. market volatility and over three times its level at the end of 2006. Nevertheless spikes in market volatility tend to be short-lived. Deviations from the mean level of the VIX have a half life of about 6 months. By July 2009 the VIX had fallen to 25%, little more than the long-term average volatility. Thus, while equity investors in December 2008 may have demanded an unusually high return in the short run,¹⁸ I do not believe there is a strong case for judging that the long-term risk expected risk premium increased between December 2006 and 2008.

In sum, the decline in interest rates between 2006 and 2008 may be reflected in a reduction in the long-term return that investors require from equities, but this reduction is probably no more than .5%. It is also possible that the increased market volatility over this period has had the opposite effect of *increasing* the required return, but I believe that any such effect is largely confined to the short-term.

¹⁷ This may be the reason that the periodic survey of finance professors referred to above suggested a slightly lower risk premium in 2007.

¹⁸ Correspondingly, in the benign market of 2006 investors may have been content with a relatively low expected return in the short run.