Oxera

2009–10 assessment of overcompensation in the Irish PHI market

Prepared for
The Health Insurance Authority

November 18th 2011

Final version in PDF

Redacted by HIA October 2013

Deletions in text indicated by xxx and in tables by missing data.

Strictly confidential

Contents

List of tables

1 Introduction and summary of results

Introduction

1.1 This report presents financial calculations to assist the Health Insurance Authority (HIA) in making an assessment of potential overcompensation to private health insurers in Ireland for the two-year period from 2009 to 2010.

1.2 In July 2009, the Irish government introduced a levy and tax credit scheme to promote intergenerational solidarity in the provision of private health insurance (PHI).[1] Following the European Commission's decision of June 2009,[2] the levy and tax credit scheme falls within the framework for Services of General Economic Interest (SGEI) and should therefore be assessed such that the compensation to insurers should not exceed the costs incurred, and that these costs should include a 'reasonable profit'.

1.3 The methodology used to assess overcompensation was set out in Oxera's earlier report for the HIA, 'How to assess overcompensation in the Irish PHI market? Methodology and data requirements'. This current report assesses overcompensation of the Irish health insurance provider(s) that were net beneficiaries of the scheme in 2009 and 2010.[3] This fulfils the requirement in accordance with Section 7F of the Health Insurance (Miscellaneous Provisions) Act 2009.

1.4 The report is structured as follows.

- Section 2 explains briefly the methodology followed by Oxera
- Section 3 provides internal and external benchmarks for the profitability of Vhi
- Section 4 analyses Vhi's profitability
- Section 5 concludes on the matter of overcompensation

Executive summary of main results

1.5 The profitability of Vhi's SGEI-related activities in the said period as measured by its return on equity (ROE) was xx%. Vhi's return on capital employed (ROCE), another measure of profitability, was xx% for the two-year period. Accounting for all Vhi's activities for the same period (ie, including SGEI- and non-SGEI-related activities), the ROE of Vhi was xx%. Similarly, the ROCE for all activities of Vhi was xxx%. Table 1.1 provides further breakdown of Vhi's profitability.

[1] Insurers receive higher premia for insuring people over the age of 60, who in turn receive age-related tax credits (ARTC) equal to the amount of the additional premium so that all people continue to pay the same amount for their health insurance. The fiscal cost of the ARTC is funded by a levy on insurers that is based on the number of customers with health insurance.

[2] European Commission (2009), 'State Aid No N 582/2008—Ireland: Health Insurance Intergenerational Solidarity Relief', June 17th.

[3] A previous Oxera report carried out this analysis for 2009 only. See Oxera (2010), 'Assessment of overcompensation in the Irish PHI market, Financial Year 2009', Report prepared for the Health Insurance Authority, September 20th.

Table 1.1 Vhi's profitability measures

	SGEI-related activities	Non-SGEI-related activities	All activities
2009			
ROE (%)			
ROCE (%)			
2010			
ROE (%)			
ROCE (%)			
2009–10 average			
ROE (%)			
ROCE (%)			

Source: Vhi and Oxera calculations.

1.6 Table 1.2 compares the profitability of Vhi's SGEI-related activities against various benchmarks. The evidence shows that, for the two-year period from 2009 to 2010, the profitability of Vhi's SGEI-related activities was clearly below the benchmarks for a reasonable profit level.

Table 1.2 Profitability of Vhi's SGEI-related activities for the period 2009–10

Vhi's profitability measures	Internal benchmark	External benchmark (Aviva)	Aviva & Quinn with reallocation
ROE (%)	10.4		
ROCE (%)	11.1		

Note: Details on the benchmarks are provided in section 3, including the reason why Aviva data only was used for the external benchmark.
Source: Aviva and Oxera calculations.

1.7 The compensation received by Vhi in 2009 and 2010 for providing SGEI therefore does not exceed the costs incurred, where these costs include a reasonable profit. Therefore, Vhi has not been overcompensated, fulfilling the criterion of the SGEI Framework, and in accordance with Section 7F of the Health Insurance (Miscellaneous Provisions) Act 2009.

2 Methodology

2.1 The Health Insurance (Miscellaneous Provisions) Act 2009, which provides for the levy and tax credit scheme, sets out the steps to be followed when seeking to establish whether an undertaking has been overcompensated for providing the SGEI:

– determine what would constitute a reasonable profit in respect of its health insurance business (Section 7F(4));

– identify net beneficiaries to the scheme (Section 7F(5)); and

– calculate whether the net beneficiary has made a profit in excess of a reasonable profit (Section 7F(6)).

2.2 This section summarises the practical steps required to fulfil this requirement. A more detailed description is provided in the Oxera methodology report.

Determining a reasonable profit

2.3 Reasonable profit on SGEI-related activities can be determined with reference to both internal and external benchmarks. Internal benchmarks consist of the insurer's own cost of equity and cost of capital. External benchmarks consist of profitability measures for comparable firms.

Identifying the net beneficiary

2.4 Three health insurers currently participate in the levy and tax credit scheme in Ireland: Vhi, Quinn and Aviva. Identifying the net beneficiary or beneficiaries requires determining which firms have received more tax credits than they paid levies (see Table 2.1).

Table 2.1 Net benefits from levy and tax credit scheme

	Vhi	Aviva	Quin
2009			
Levy paid (€m)			
ARTC received (€m)			
Net benefit (€m)			
2010			
Levy paid (€m)			
ARTC received (€m)			
Net benefit (€m)			
2009 and 2010 net benefit (€m)			

Note: ARTC stands for age-related tax credit—ie, the tax credit scheme.
Source: Profit and loss statement for Vhi, Aviva, Quinn and Oxera calculations.

2.5 As shown in Table 2.1, in both 2009 and 2010 Vhi was the only net beneficiary of the scheme, receiving a net total of €xxm from the scheme. The analysis in this report therefore assesses whether, during 2009 and 2010, Vhi was overcompensated through the levy and the tax credit scheme.

Assessment of overcompensation

2.6 Having obtained estimates of 'reasonable profit' with reference to internal and external benchmarks, as well as the profitability of Vhi (as the current net beneficiary), the report then compares the benchmarks with Vhi's realised profitability.

3 Profitability benchmarks

Internal benchmarks

3.1 Internal benchmarks consist of Vhi's own cost of equity and cost of capital. The cost of equity is estimated using the capital asset pricing model (CAPM), while the cost of capital is estimated as the weighted average cost of capital (WACC). The cost of equity using the CAPM is estimated as risk-free rate + equity beta × equity risk premium (ERP). In order to account for Ireland-specific conditions—ie, the country risk premium—the approach taken

here adds the said premium to the ERP in the CAPM equation.[4] The WACC takes into account the cost of equity, the cost of debt,[5] and the ratio of equity to debt capital (leverage ratio).

3.2 The results for Vhi are summarised in Table 3.1. Appendix 1 gives the details of the calculation.

Table 3.1 Cost of equity (CoE) and cost of capital of Vhi's SGEI activities

	2009		2010	
	Low	**High**	**Low**	**High**
Risk-free rate (%)	3.1	3.5	2.4	2.9
Debt premium (%)	1.5	1.9	1.8	2.0
Country risk premium (%)	1.4	1.4	4.4	4.4
Cost of debt (%)	6.0	6.8	8.6	9.3
ERP (%)	4.7	4.9	4.9	5.0
Asset beta	0.75	0.75	0.79	0.79
Equity beta	0.88	0.88	1.00	1.00
Post-tax CoE (%)	8.5	9.1	11.7	12.2
Pre-tax CoE (%)	**9.7**	**10.4**	**13.3**	**14.0**
Leverage (%)	xx	xx	xx	xx
Effective tax rate (%)	12.5	12.5	12.5	12.5
Post-tax WACC (nominal, %)	8.0	8.6	10.8	11.4
Pre-tax WACC (nominal, %)	**9.1**	**9.8**	**12.3**	**13.0**

Note: Figures may not add up due to rounding.
Source: As indicated in the appendix and Oxera calculations.

3.3 For the purposes of assessing whether Vhi has been overcompensated during the two-year period from 2009 to 2010, pre-tax cost of equity and pre-tax WACCs were used as internal benchmarks for ROE and ROCE.

3.4 The range used for the internal benchmark was obtained by averaging the lower and upper bounds for the WACC estimates for the two years separately. The point-estimate was then obtained by taking the mid-point of the range. As can be seen from Table 3.2, an internal benchmark of 10.4% will be used when assessing the level of ROE and an internal benchmark of 11.1% will be used when considering the level of ROCE.

[4] While there are other ways of incorporating country risk premia in the cost of capital estimations, it is considered that this method is the most appropriate for this assessment. An alternative would be to add the country risk premium to the cost of capital as calculated using the CAPM equation (or, equivalently, adding the country risk premium to the risk-free rate). Appendix 1 provides further discussion.

[5] Cost of debt is calculated as the sum of the risk-free rate, the debt premium and the country risk premium.

Table 3.2 Internal benchmarks for the period from 2009 to 2010

	Average low	Average high	Mid-point
Cost of equity (%)	10.1	10.6	10.4
WACC (%)	10.7	11.4	11.1

Source: As indicated in the appendix and Oxera calculations.

External benchmarks

3.5 The external benchmarks approach compares the ROE and ROCE for Vhi against the equivalent profitability measures of its comparator firms. In Ireland, during the period concerned, there were two other firms that provided SGEI-related services: Quinn and Aviva.

3.6 Sensible estimates of profitability measures could not be obtained for Quinn for this report. Moreover, Quinn is much less relevant as a comparator to Vhi in this report. Appendix 2 provides more detail on the Quinn financial data.

3.7 Table 3.3 summarises the evidence, providing, where possible, individual ROE and ROCE estimates as well as equity-weighted average ROE and capital-weighted ROCE for Quinn and Aviva on their SGEI-related activities for the period from the beginning of 2009 to the end of 2010. The table also reports ROE and ROCE measured with reallocation for Quinn. This is done for consistency since, unlike Aviva and Vhi, Quinn did not allocate 100% of its levy and age-related tax credit (ARTC) to SGEI-related activities. A summary of the ROE and ROCE calculations is given in Appendix 2.

Table 3.3 ROE and ROCE from Irish comparators

	Aviva	Quinn	Weighted average
2009			
ROE (%)			
ROCE (%)			
ROE with reallocation (%)			
ROCE with reallocation (%)			
2010			
ROE (%)			
ROCE (%)			
ROE with reallocation (%)			
ROCE with reallocation (%)			
2009–10 average			
ROE (%)			
ROCE (%)			
ROE with reallocation (%)			
ROCE with reallocation (%)			

Note: In contrast to Aviva and Vhi, Quinn did not allocate 100% of its levy and ARTC to SGEI-related activities. The profitability measures with reallocation refer to the estimates obtained when the levy and the ARTC for Quinn are fully allocated to the SGEI-related activities. Note that this reallocation only affects Quinn. ROE and ROCE estimates for Quinn 2010 could not be obtained, since the total reserve and capital employed used to calculate these measures were found to be negative.
Source: Quinn, Aviva and Oxera calculations.

3.8 Table 3.4 shows the possible external benchmarks for the two-year period from 2009 to 2010. While weighted average data for Quinn and Aviva have been calculated and illustrated, the Aviva data on their own represent the external benchmark.[6] As illustrated in the tables, the internal benchmarks shown in Table 3.2 are much lower than the external benchmarks.

Table 3.4 External benchmarks for the period from 2009 to 2010

	Aviva	Aviva & Quinn	Aviva & Quinn with reallocation
Cost of equity (%)			
WACC (%)			

Note: In contrast to Aviva and Vhi, Quinn did not allocate 100% of its levy and ARTC to SGEI-related activities. The profitability measures with reallocation refer to the estimates obtained when the levy and the ARTC for Quinn are fully allocated to the SGEI-related activities. Note that this reallocation only affects Quinn.
Source: As indicated in the appendix and Oxera calculations.

3.9 Table 3.3 showed the comparable ROE and ROCE for the SGEI related health insurance business of both Quinn and Aviva and the weighted average rate for the SGEI businesses of both where possible.

3.10 It should be noted that Quinn Insurance Ltd is under administration by court appointment and that there has been a large restatement of profit and loss in 2009 mainly due to a large writedown of the value of investments in the balance sheet but also significantly due to a large increase in technical reserves. As a result, investment income for the SGEI health insurance business in 2009 was restated to €xxm from €xxm, which was the figure in the 2009 accounts used in the overcompensation assessment for the year 2009. The previous accounts for 2009 had reported a profit after tax of €xxm for the Quinn SGEI health insurance business whereas the restated accounts for 2009 now report €xxm.

3.11 Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx.

3.12 The facts of the administration of Quinn Insurance Ltd, the previous large overvaluation of the investment assets of the firm and the large increase in technical reserves for the year 2009 gives rise to some doubt as to whether the restated profit and loss for 2009 and the draft profit and loss for 2010 of the SGEI health insurance business of Quinn are appropriate to use as part of an external benchmark for 'reasonable profit' as set out in the Health Insurance Act 1994. The large loss stemming from a large investment writedown is not representative of normal general insurance business. It is considered that the aggregate financial results of the SGEI health insurance business of Quinn for 2009 and 2010 that have been described in this assessment are not those of a comparable undertaking to the SGEI business of the Vhi. In addition it is not possible to calculate the ROE or ROCE (measures the Authority uses in defining a reasonable profit) for Quinn Healthcare because the large writedown in asset values together with the large increase in technical reserves means that the insurer does not have equity (or an equivalent) in the period in question.

3.13 This means that Aviva Health is the only comparable undertaking to the Vhi in the SGEI health insurance business in Ireland for the purposes of this overcompensation assessment, and that therefore the ROE and ROCE of the SGEI business of Aviva Health should be considered as the external benchmark in this assessment.

[6] For this analysis, Oxera has used the restated accounts of Quinn for 2009.

4 Profitability of Vhi

4.1 Table 4.1 presents estimates of Vhi's profitability in the two-year period from 2009 to 2010. It shows ROE and ROCE estimates using the allocation of revenues and costs between SGEI and non-SGEI activities, as submitted by Vhi. A summary of the ROE and ROCE calculations is given in Appendix 2.

Table 4.1 Estimates of profitability of Vhi's SGEI-related activities in 2009 and 2010

	Estimates
2009	
ROE (%)	
ROCE (%)	
2010	
ROE (%)	
ROCE (%)	
2009–10 average	
ROE (%)	
ROCE (%)	

Note: Due to data availability, the adjustment carried out in the previous report to Vhi's profit and loss statement and balance sheet cannot be conducted for the 2010 data. Thus, only the unadjusted ROE and ROCE measures are reported in Table 4.1.
Source: Vhi and Oxera calculations.

4.2 The ROE and ROCE estimates of xx% and xx%, respectively, will be compared against the internal and external benchmarks.

5 Conclusion on overcompensation

Benchmarks

5.1 Consistent with the requirements of the Act, the reasonable profit should be in line with the internal benchmarks, which should not normally exceed the external benchmarks.

5.2 Given data availability and the robustness of estimates,[7] when assessing overcompensation for the two-year period from 2009 to 2010, the emphasis is put on the comparison between the cost of equity and ROE of Vhi. For the purposes of the assessment of overcompensation in the concerned period, the reasonable profit of Vhi is therefore defined as the cost of equity of 10.4%.

5.3 As stated, Vhi's profitability as measured by ROCE will be compared to the cost of capital. The reasonable profit of Vhi in this way is defined as the cost of capital of 11.1%.

5.4 As for the external benchmarks, reasonable profit as measured by ROE, which will be compared with the cost of equity, is defined as xxx%. Similarly, reasonable profit as measured by ROCE is defined as xxx%.

[7] In principle, both equity-based and capital employed-based measures provide a strong basis for assessing overcompensation. In this instance due to data availability, estimates of the capital employed are somewhat less robust than the estimates of total shareholder capital, and therefore the capital employed-based measures are less robust than the equity-based measures. Nevertheless, the capital employed-based measures provide an important cross-check to the analysis based on the equity-based measures.

Comparison with benchmarks

5.5 The evidence in Table 5.1 shows that the profitability of Vhi's SGEI-related activities was below the estimate of reasonable profit in the two years from 2009 to 2010. The ROE of Vhi's SGEI-related activities in the period was xxx%, considerably lower than either the internal or the external benchmark. Similarly, ROCE measure of profitability confirms these findings—Vhi's ROCE was significantly below either the internal or the external benchmarks.

Table 5.1 Comparison of Vhi's profitability with benchmarks

Vhi's profitability measures	Internal benchmark	External benchmark (Aviva)
ROE (%)	10.4	
ROCE (%)	11.1	

Source: Aviva, Vhi and Oxera calculations.

5.6 Therefore, the compensation received by Vhi in 2009–10 for providing an SGEI does not exceed the costs incurred, where these costs include a reasonable profit. In 2009–10 Vhi has therefore not been overcompensated, fulfilling the criterion of the SGEI Framework and in accordance with Section 7F of the Health Insurance (Miscellaneous Provisions) Act 2009.

Sensitivity analyses

5.7 The following sensitivity analyses were carried out to investigate the sensitivity of:

- Vhi's profitability to an alternative method of allocating between SGEI- and non-SGEI-related activities.
- Vhi's profitability to an alternative estimation methodology of ROE and ROCE.

5.8 Importantly, the sensitivity analyses support the conclusion that Vhi was not overcompensated.

A1 Cost of capital for Vhi

A1.1 The approach taken here to calculate the cost of capital is to estimate the low and high parameters estimates for the components of the WACC for the two years separately, then average the lower and upper bounds individually to obtain a range for the cost of capital for the two-year period.

Risk-free rate

A1.2 The risk-free rate is the rate of return that investors require on an asset that yields certain returns. A common proxy for the risk-free rate is yields on government bonds that are deemed to be free from default risk and are of high liquidity. Often, bonds with relatively long maturities are used to estimate the risk-free rate. In this analysis, bond maturities of between seven and ten years were used as a proxy for the risk-free rate.

A1.3 Insofar as the risk-free rate should reflect the return required by investors in order to invest in the least risky asset available, it may not be appropriate to use Irish government bond yields for this analysis, given recent market conditions. The treatment of sovereign risk is a complex issue and there are a number of different approaches that could potentially be adopted. One approach would be to use German government bonds in order to proxy the risk-free rate. For the purposes of this study, this approach has been adopted.

A1.4 Table A1.1 shows the spot and historical averages of the yields on 7–10-year maturity German sovereign bonds as at the end of 2009 and 2010. It suggests that the spot yields are broadly in line with yields observed over a six-month and two-year period.

Table A1.1 Yields of German government bonds

		Averaging period	
Date	Spot	Six months	Two years
As at December 31st 2009	3.2	3.1	3.5
As at December 31st 2010	2.8	2.4	2.9

Note: As mentioned previously, the yields are for German government bonds with maturities of seven to ten years.
Source: Datastream and Oxera calculations.

A1.5 Ranges used for the WACC calculation are given by the lowest and the highest value reported in Table A1.1 for the relevant year—ie, ranges of 3.1–3.5% for 2009 and 2.4–2.9% in 2010.

ERP

A1.6 Table A1.2 summarises the realised historical risk premium estimates (based on approximately 110 years of data) provided by Dimson, Marsh and Staunton (2010, 2011).

Table A1.2 Historical estimates of the ERP

	Geometric mean	Arithmetic mean
2009		
Ireland (%)	2.9	4.7
World (%)	3.8	4.9
2010		
Ireland (%)	2.6	4.9
World (%)	3.7	5.0

Source: Dimson, E., Marsh, P. and Staunton, M. (2010), 'Credit Suisse Global Investment Returns Sourcebook 2010', February. Dimson, E., Marsh, P. and Staunton, M. (2011), 'Credit Suisse Global Investment Returns Sourcebook 2011', February.

A1.7 As can be seen from Table A1.2, the ERP can be estimated on the basis of either geometric or arithmetic averages. A large difference between the two implies that year-to-year variances have been large in the past.[8] There is some debate around the most appropriate averaging method; however, consensus supports the use of arithmetic averages. For example, Dimson, Marsh and Staunton (2010) recommend the arithmetic average 'for use in asset allocation, stock valuation, and corporate budgeting applications'.[9] This is consistent with analytical studies, such as Cooper (1996), which suggest that greater weight should be placed on arithmetic than on geometric estimates of returns.[10]

A1.8 In light of this, when estimating the cost of capital of Vhi, ranges given by the lowest and the highest values for the arithmetic means for the relevant years were used—ie, 4.7–4.9% in 2009 and 4.9–5.0% in 2010.

Accounting for Ireland-specific conditions (country risk premium)

A1.9 Table A1.3 presents Ireland's sovereign spread against German government bonds for 7–10-year maturity. The evidence on German and Irish government bonds suggests a country risk premium of 1.1–1.6% for 2009 and 2.5–6.4% for 2010. For the purposes of this analysis, mid-points of the range for each year were used due to the relatively large difference between various averaging periods, especially for 2010.

A1.10 In the context of cost of capital calculation, the country risk premium is relevant in two areas. First, the country risk premium affects the cost of debt for a company. Second, it affects the cost of equity. Although there are various ways of incorporating the country risk premium into the CAPM, the approach adopted here adds the country risk premium to the ERP. This is under the assumption that exposure to country-specific risk is proportional to the companies' exposure to all other forms of market risk (captured by beta).[11] A potential limitation of this approach is that the sovereign spread may reflect different risks to those to which equity investors are exposed. However, the risk premium on Irish stocks (which represent a contingent claim with no sovereign guarantee) might potentially be expected to be at least as high as the risk premium on Irish debt (which represents a fixed income claim backed by sovereign guarantee).

[8] Note that since ERPs are always positive, the geometric means will always be less than or equal to the arithmetic means.

[9] Dimson, E., Marsh, P. and Staunton, M. (2010), 'Credit Suisse Global Investment Returns Sourcebook', p. 34.

[10] Cooper, I. (1996), 'Arithmetic versus geometric mean estimators: Setting discount rates for capital budgeting', *European Financial Management*, **2**:2, p. 157.

[11] Alternatively, it is possible to add the country risk premium to the cost of equity calculated using the CAPM equation (or, equivalently, adding the country risk premium to the risk-free rate). This implicitly assumes that all firms are equally exposed to the country-specific risk.

Table A1.3 Ireland sovereign spread against Germany

		Averaging period	
Date	Spot	Six months	Two years
As at December 31st 2009 (%)	1.6	1.6	1.1
As at December 31st 2010 (%)	6.4	4.2	2.5

Source: Datastream and Oxera calculations.

Betas

A1.11 Since Vhi is not traded, its beta was estimated using a sample of listed firms with risk characteristics similar to those of Vhi. For the purposes of this analysis, Vhi's comparators are chosen from three insurance sectors: full-line insurance, life insurance, and property and casualty.

A1.12 The comparators were chosen from constituents of the DJ Stoxx Insurance index (as at May 31st 2010). 58 firms fell into one of the three sub-sectors[12] chosen for this analysis:

- full-line insurance—22 firms;
- life insurance—20 firms;
- property and casualty—16 firms.

A1.13 Betas are calculated for the 58 companies in the sample, considering the three sub-sectors separately. For the estimation of betas, a three-year period (ending December 31st 2009 and 2010) based on daily data was used.[13]

A1.14 The equity beta estimated from market data reflects various companies' exposure to market risk as well as the leverage of the individual firms. Estimating Vhi's equity beta therefore requires the comparators' equity betas to be adjusted for the leverage differentials between Vhi and other insures. This in turn requires de-levering individual equity betas with their respective leverage ratio to obtain the 'asset beta', and then re-levering the asset beta by Vhi's leverage ratio.

A1.15 Table 1.4 shows the mean and median of the comparators' asset betas. Relatively large disparity between the mean and the median was caused by a few outliers. Therefore, in order to obtain the estimate for the cost of capital calculation, the median statistic was used to mitigate the effects of such outliers.

A1.16 The specific range used for the cost of capital calculation was obtained by taking the mid-point of the range defined by the lowest and highest estimates of median asset betas for the three types of insurance companies. This gives an asset beta estimate of 0.75 for 2009 and 0.79 for 2010. Vhi's leverage ratio was xx% in 2009 and xx% in 2010, which implies equity betas of xx and xx in 2009 and 2010 respectively.

[12] Sub-sectors are defined in accordance with the Datastream Level 4 classification.

[13] The analysis shows that, on average, beta estimates have not been affected by recent turbulence in financial markets, whereby average estimates across firms for the three-year period ending December 31st 2009 are similar to three-year beta estimates for the period ending December 31st 2007.

Table A1.4 Asset betas by insurer type

	Full-line insurers	Life insurance	Property and casualty
2009			
Number of firms	21	20	16
Mean asset beta	0.38	1.07	0.35
Median asset beta	0.57	0.99	0.52
2010			
Number of firms	20	19	16
Mean asset beta	0.64	0.94	0.80
Median asset beta	0.60	1.02	0.56

Note: Leverage was calculated using the formula: net debt/(net debt + total shareholder equity). Debt beta is assumed to be zero, and the Miller formula is applied for conversion between asset and equity betas.
Source: Bloomberg, Datastream and Oxera calculations.

Debt premium

A1.17 Debt premia of bonds issued by comparators in the insurance industry within a certain credit rating band may provide an estimate of Vhi's debt premium. Firms with credit ratings of 'A' are assumed to be relevant comparators for estimating Vhi's debt premium. This is based on the rating of the Irish government ('AA–' in the relevant two years) as well as on the fact that, overall, Vhi is a loss-making company, and is unlikely to be rated higher than the government.

A1.18 Table A1.5 presents the current and historical debt spreads on the bonds of comparator firms with maturities up to 20 years. The firms and bonds in this sample were selected from listed bonds of A-rated European insurance firms—a subset of the sample used to estimate betas.[14]

A1.19 For the cost of capital calculation, the range for debt premium was obtained using the minimum and maximum of the averages for each year. This gives a range for debt premium of 1.5–1.9% and 1.8–2.0% in 2009 and 2010 respectively.

[14] All bonds with maturity of more than 20 years, those with hybrid features (eg, a conversion option), and those with a variable-rate coupon were excluded from this analysis.

Table A1.5 Spot and average debt spreads

Name	Year of maturity	Bond rating	Averaging period: Spot (%)	Six months (%)	Two years (%)
As at December 31st 2009					
Swiss	2014	A+	1.12	–	–
AEGON	2014	A–	1.45	1.61	2.55
AEGON	2015	A–	2.02	–	–
ING Groep	2016	A	1.62	1.57	1.61
ING Groep	2017	A	1.58	1.65	1.94
AEGON	2019	A–	1.99	2.02	1.56
Assic. Generali	2024	A+	0.95	–	–
Average			**1.53**	**1.71**	**1.91**
As at December 31st 2010					
Swiss	2014	A+	1.16	1.23	–
AEGON	2014	A–	1.67	1.48	2.08
AEGON	2015	A–	1.94	1.99	–
ING Groep	2016	A	1.75	1.81	1.78
ING Groep	2017	A	1.91	1.91	1.98
AEGON	2019	A–	2.27	2.89	2.31
Assic. Generali	2024	A+	1.65	1.48	–
Average			**1.76**	**1.83**	**2.04**

Note: Bonds with no longer-term averages are those that were not traded throughout the period for which the historical averages are being calculated.
Source: Datastream and Oxera calculations.

Leverage

A1.20 To calculate a firm's WACC, its leverage (ie, the share of debt of its total capital) needs to be estimated. This is estimated as the ratio of (total capital employed less total shareholder funds) to the total capital employed. Table A1.6 shows estimates of Vhi's leverage for SGEI activities.[15]

A1.21 Oxera is aware that the leverage here is calculated using book value and, ideally, one should instead use the market value. However, due to the fact that Vhi is state-owned and unlisted, the estimate of the leverage ratio was based on book value.

A1.22 As Table 1.6 shows, Vhi's estimated leverage in 2009 was xx% in 2009, and xx% in 2010.

[15] Section 5 provides calculations of proxy for total shareholder funds and total capital employed.

Table A1.6 Leverage of Vhi's SGEI activities

	SGEI activities
2009	
Total capital employed (€'000)	
Proxy for total shareholder funds (€'000)	
Leverage (%)	
2010	
Total capital employed (€'000)	
Proxy for total shareholder funds (€'000)	
Leverage (%)	

Source: Vhi and Oxera calculations.

A1.23 In 2009 and 2010, Vhi did not pay corporation tax on its SGEI-related activities in 2009 and 2010. However, this was due to the fact that the said activities were loss-making—had they been profitable, Vhi would have paid taxes. Thus, when calculating the internal benchmark, the statutory corporate tax rate of 12.5% was used. Doing so incorporates the tax advantages of raising debt, and, as a result, the cost of debt would be lower compared with no tax being assumed.

Summary

A1.24 Table A1.7 shows the selected range of parameters, the cost of equity and the cost of capital of Vhi's SGEI activities.

Table A1.7 Cost of equity (CoE) and cost of capital of Vhi's SGEI activities

		2009		2010	
	Calculation	Low	High	Low	High
Risk-free rate (%)	A	3.1	3.5	2.4	2.9
Debt premium (%)	B	1.5	1.9	1.8	2.0
Country risk premium (%)	C	1.4	1.4	4.4	4.4
Cost of debt (%)	D = A + B + C	6.0	6.8	8.6	9.3
ERP (%)	E	4.7	4.9	4.9	5.0
Asset beta	n/a	0.75	0.75	0.79	0.79
Equity beta	G	0.88	0.88	1.00	1.00
Post-tax CoE (%)	H = A + G × (E + C)	8.5	9.1	11.7	12.2
Pre-tax CoE (%)	I = H / (100% – K)	**9.7**	**10.4**	**13.3**	**14.0**
Leverage (%)	J				
Effective tax rate (%)	K	12.5	12.5	12.5	12.5
Post-tax WACC (nominal, %)	(100% – K) × J × D + (100% – J) × H	8.0	8.6	10.8	11.4
Pre-tax WACC (nominal, %)	J × D + (100% – J) × I	**9.1**	**9.8**	**12.3**	**13.0**

Note: Figures may not add up due to rounding.
Source: As indicated in the appendix and Oxera calculations.

A2 Profitability calculations

Aviva

A2.1 Table A2.1 shows the components of the two profitability measures for Aviva for 2009 and 2010. Note that the method used to allocate between SGEI and non-SGEI activities used in 2010 by Quinn was consistent with the method used in 2009.

A2.2 In order to eliminate the need to account explicitly for inflation and discounting, ROE and ROCE for the two-year period from 2009 to 2010 were obtained by taking the average of the two measures from 2009 and 2010.

Table A2.1 Profitability measures for Aviva

	2009	2010	2009–10 average
Profits before tax (€'000)			
Total reserve (€'000)			
ROE (%)			
Profits before tax (€'000)			
Capital employed (€'000)			
ROCE (%)			

Note: No adjustment was required for Aviva. Total reserve was estimated using net assets from the balance sheet. Total capital employed was estimated as the sum of capital and reserves, bank overdraft, other creditors, and pension deficit less cash held in bank.
Source: Vhi and Oxera calculations.

Quinn

A2.3 Table A3.1 shows the components of the two profitability measures for Quinn for 2009 and 2010.

A2.4 Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

A2.5 Note that neither ROE nor ROCE for 2010 could be calculated, since the estimates for the total reserve and capital employed were both negative for the year.

A2.6 In order to eliminate the need to account explicitly for inflation and discounting, ROE and ROCE for the two-year period from 2009 to 2010 were obtained by taking the average of the two measures from 2009 and 2010.

Table A2.2 Profitability measures for Quinn with revised 2009 data

Name	2009		2010		2009–10 average	
	No reallocation	Reallocated	No reallocation	Reallocated	No reallocation	Reallocated
Profits before tax (€'000)						
Total reserve (€'000)						
ROE (%)						
Profits before tax (€'000)						
Capital employed (€'000)						
ROCE (%)						

Note: Total reserve was estimated using total shareholder funds. Capital employed was estimated as the sum of shareholder fund and other creditors & accruals. The latter was used since, in contrast to Aviva and Vhi, the data solely for other creditors were not available for Quinn. As described earlier, Levy and ARTC reallocation implies that these items were fully assigned to SGEI-related activities.
Source: Vhi and Oxera calculations.

Vhi

A2.7 Table A2.3 shows the components of the two profitability measures for Vhi for 2009 and 2010. The method used to allocate between SGEI and non-SGEI activities used in 2010 by Vhi was consistent with the method used in 2009.

A2.8 In order to eliminate the need to account explicitly for inflation and discounting, ROE and ROCE for the two-year period from 2009 to 2010 were obtained by taking the average of the two measures from 2009 and 2010.

A2.9 As reported in the text previously, some adjustments made to Vhi's profit and loss statement and balance sheet in the previous report could not be implemented for the 2010 data. The adjustment involved excluding 'short-term fluctuation on investment returns' from the profits. However, due to changes in accounting, the former component of the profit and loss statement was not available for 2010.

A2.10 Table A2.3 reports both adjusted and unadjusted ROE and ROCE measures. In the analysis, however, only unadjusted ROE and ROCE measured were adopted due to the fact that adjustments cannot be made symmetrically between the two years.

Table A2.3 Profitability measures for Vhi

	2009		2010		2009–10 average	
Name	**Unadjusted**	**Adjusted**	**Unadjusted**	**Adjusted**	**Unadjusted**	**Adjusted**
Profits before tax (€'000)						
Total reserve (€'000)						
ROE (%)						
Profits before tax (€'000)						
Capital employed (€'000)						
ROCE (%)						

Note: Total reserve was estimated using general reserve on the balance sheet. Capital employed was estimated as the sum of general reserve, bank overdraft, retirement benefits liability and other creditors. As described earlier, the adjustment excludes short-term fluctuations on investment returns, for 2009 only.
Source: Vhi and Oxera calculations.

A3 Sensitivity analyses

Alternative allocations for Vhi

A3.1 Vhi allocates costs based on the split shown in the Information Returns, while premia are allocated depending on the costs of the plan relative to Plan B. Oxera is not aware of any particular allocation method being a priori more appropriate than another. It is nevertheless useful to understand whether the conclusion of Vhi's profitability is sensitive to the allocation method used.

A3.2 This part of the analysis therefore considers the impact of changing the allocation method used by Vhi on the ROE and ROCE of SGEI-related activities. Xxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx.

A3.3 Given the methodology used by Vhi, this new approach implies that xxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx.

A3.4 Table A3.1 compares the estimates obtained by this alternative method against the internal and the external benchmarks. Even though the estimates have changed dramatically, it is clear that the conclusion—that Vhi was not overcompensated during the two-year period of 2009 and 2010—remains unchanged.

Table A3.1 Comparison of Vhi's profitability activities for the period 2009–10

	Vhi's profitability measures	Internal benchmark	External benchmark (Aviva)	Aviva & Quinn with reallocation
ROE (%)		10.4		
ROCE (%)		11.1		

Note: The original estimates for ROE and ROCE were xx% and xx% respectively.
Source: Aviva, Quinn, Vhi and Oxera calculations.

ROE and ROCE of Vhi based on external measures of capital

A3.5 So far, estimates of Vhi's ROE and ROCE were obtained using estimates of equity and total capital employed based on identifying the items in Vhi's own balance sheet that most closely match the economic function of equity and capital. An alternative approach would be to examine the capital structure of comparable companies to establish a benchmark ratio of equity and capital with respect to assets or gross premia, and then to apply this ratio to Vhi. Doing this provides alternative estimates of equity and total capital, which can then be used to calculate ROE and ROCE.

A3.6 The weighted average of Quinn and Aviva's ratio of equity capital to gross premia was xx% in 2009, and xx% in 2010.[16] The weighted average of Quinn and Aviva's ratio of total capital to gross premia was xx% in 2009, and xx% in 2010. Multiplying these ratios by Vhi's gross written premia for SGEI-related activities gives the estimates for total equity and capital. Applying this method resulted in estimates for ROE of xx% and ROCE of xx% for the period 2009–10.

[16] The weighting in the weighted average is given by the value of gross written premia for Aviva and Quinn.

A3.7 Alternatively, using Aviva's ratio of equity capital to gross premia of xx% in 2009, and xx% in 2010 gives the estimate for ROE of xx%. Similarly, using Aviva's ratio of total capital to gross premia of xx% in 2009 and xx% in 2010 gives the estimate for ROCE of xx%.

A3.8 The estimates of ROE and ROCE are xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx supporting the conclusion made earlier that Vhi was not overcompensated for the two-year period.

Park Central
40/41 Park End Street
Oxford OX1 1JD
United Kingdom

Tel: +44 (0) 1865 253 000
Fax: +44 (0) 1865 251 172

Stephanie Square Centre
Avenue Louise 65, Box 11
1050 Brussels
Belgium

Tel: +32 (0) 2 535 7878
Fax: +32 (0) 2 535 7770

Thavies Inn House
7th Floor
3/4 Holborn Circus
London EC1N 2HA
United Kingdom

Tel: +44 (0) 20 7822 2650
Fax: +44 (0) 20 7822 2651

www.oxera.com