

A note on Return on Equity (RoE)

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An example of a RoE calculation by IFM is presented below. We created a fictitious motorcar insurance portfolio, from which we can extract vital information through Integral Financial Modelling (IFM). This information results from linked IFM models for number of reported claims, closed claims, loss payments and case reserves.

Table 1 provides in a nutshell the actuarial outcome to be used for judgement on future premium. We confined ourselves to the risk premium and the necessary adjustments hereon. For that reason future payments were discounted at a 3.25% rate and prudency and solvency levels were calculated at a 75 and 99.5% probability level respectively. The insurance company is assumed to act risk neutral, which means that a RoE based on the expected value principle should assess future risk. This RoE is set on 20%, which indicates a rise of the premium level by 7.5% for 2006.

In Table 2 and its graph an impression is given of the predictions for recent and future risk produced by the various models. This output runs on a yearly basis, however, in a more elaborated environment where IFM is already integrated into the insurer's MIS, results are given on a monthly or quarterly basis.

Table 1: indicated premium adjustment 2006 (RoE)

loss period	Loss provision					risk premium per policy nominal	premium increase 2006	number of policies 2006	expected value result 2006	Rate on Equity
	expected value nominal	expected value - - - - 3.25 %	fair allocation of 75% quantile - - - - -	expected future value discounted	fair allocation of 99.5% of - - - - -					
totals	198,371	187,847	194,999	97,825	323,726					
1988	0	0	0		0					
1989	3	3	3		3					
1990	33	32	32		32					
1991	14	13	13		13					
1992	7	7	7		7					
1993	38	36	36		36					
1994	54	52	52		52					
1995	93	89	89		89					
1996	111	106	109		118					
1997	187	178	188		212					
1998	342	326	348		398					
1999	714	680	729		842					
2000	2,244	2,146	2,285		2,611					
2001	5,854	5,588	5,947		6,790					
2002	15,500	14,812	15,608		17,515					
2003	33,609	32,062	33,539		37,191					
2004	60,878	57,827	60,012		65,791					
2005	78,691	73,891	76,003		82,656	645				
2006				97,825	109,371	693	7.5%	150,000	6,181	
						Economic capital (Solvency)			30,902	20.0%

economic capital = 99.5% quantile – (prudent loss provision + expected value risk 2006)
 = 323,726 – (194,999 + 97,825)

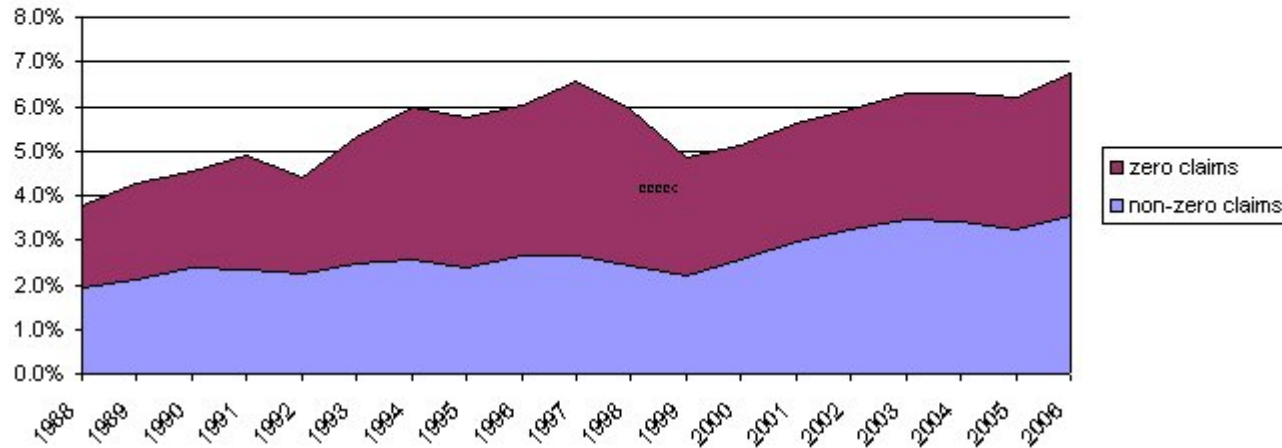
(all amounts in 1,000 €)

Table 2: MIS reported claims, closed claims and loss payments

loss period	exposure number of policies	number of reported claims				number of closed claims with payments				nominal payments in 1,000 €			
		cumulative Dec 31, 2005	expected ultimate claims	75 % quantile ultimate claims	currently predicted claims in 2006	cumulative Dec 31, 2005	expected ultimate claims	75 % quantile ultimate claims	currently predicted claims in 2006	cumulative Dec 31, 2005	expected ultimate loss	75 % quantile ultimate loss	currently predicted payments in 2006
1988	110,000	4,170	4,170	4,170	0	2,145	2,145	2,145	0	19,246	19,246	19,246	-
1989	110,000	4,717	4,717	4,717	0	2,344	2,344	2,344	0	23,159	23,162	23,162	2
1990	110,000	5,015	5,015	5,015	0	2,603	2,603	2,603	0	26,397	26,430	26,430	17
1991	120,000	5,900	5,900	5,900	0	2,826	2,826	2,826	0	30,049	30,063	30,063	7
1992	120,000	5,306	5,306	5,306	0	2,717	2,717	2,718	0	31,986	31,993	31,993	4
1993	120,000	6,348	6,348	6,348	0	2,992	2,992	2,993	0	34,524	34,562	34,562	20
1994	120,000	7,154	7,154	7,154	0	3,080	3,081	3,083	1	35,962	36,016	36,016	28
1995	120,000	6,895	6,895	6,895	0	2,860	2,862	2,865	2	35,172	35,265	35,265	49
1996	110,000	6,602	6,602	6,603	0	2,915	2,921	2,925	4	34,378	34,489	34,572	59
1997	110,000	7,214	7,214	7,216	0	2,925	2,935	2,942	5	37,681	37,868	37,988	87
1998	110,000	6,531	6,532	6,535	1	2,636	2,653	2,663	8	37,099	37,441	37,602	164
1999	120,000	5,802	5,805	5,812	2	2,617	2,652	2,667	19	36,059	36,773	37,013	334
2000	120,000	6,111	6,123	6,136	9	2,958	3,060	3,086	55	45,988	48,232	48,659	1,169
2001	130,000	7,282	7,330	7,357	34	3,559	3,832	3,882	140	56,029	63,883	64,687	2,835
2002	140,000	8,105	8,276	8,329	117	3,771	4,534	4,616	425	66,203	81,703	83,086	7,905
2003	140,000	8,287	8,806	8,898	341	3,241	4,828	4,951	765	59,232	92,841	94,946	16,224
2004	140,000	7,314	8,780	8,935	925	1,923	4,793	4,954	1,266	33,392	94,270	97,088	26,139
2005	130,000	4,044	8,049	8,290	2,589	339	4,223	4,403	1,257	5,451	84,142	87,157	23,260
2006	150,000	0	10,123	10,538	5,325	0	5,318	5,568	448	-	107,112	111,276	5,960

Graph

development loss frequency



development average loss

