

This document provides three comprehensive scenarios

- financial distress
- default of reinsurers or retrocessionaires
- pandemic

for insurance groups.

1) Financial Distress

The scenario is applicable by life and nonlife insurers. It contains a combination of several changes of the financial environment:

- Shares, real estate and hedge funds drop by 30% in value,
- Interest rates curves increase by 300 bp in all currencies.
- For life insurers: The lapse rate increases to 25% during one year and goes then back to normal.
- The volume of new business is 25% of an average year.
- For life insurer: In case of policyholder surrender the insurer cannot reduce the redemption value for contracts which are older than 5 years for group pension business (BVG).

All companies from the insurance and reinsurance market are downgraded by 3 notches.

If the insurer is rated, then the company is downgraded to the lower of the current rating less three notches and BB+ (S&P). The insurer then has to determine the financial effect of the downgrading to a subinvestment grade.

Subinvestment grades are:

Moody's: Ba1, Ba2, Ba3, B1, B2, B3, Caa

S&P: BB+, BB, BB-B+, B, B-, CCC

Examples of possible effects are redemption of debt capital by lenders and additional requirements to establish letters of credit for outstanding losses and loss of renewal business.

2) Default of Reinsurers or Retrocessionaires

The scenario considers a failure of reinsurance protection if reinsurers default. It starts from the situation of a large insurance loss for the insurer. Furthermore, the environment for reinsurers is harsh in this year, therefore their ratings have been reduced. Many of them default and cannot (completely) fulfil their obligations anymore.

As a consequence the insurer suffers a threefold loss:

- The reinsurers do not take completely the reinsured loss of the large claim mentioned.
- As many reinsurers fail, the insurer has to buy new reinsurance cover for the rest of the year, which comes at the cost of a new premium.
- The reinsurers do fulfil their obligations from old claims only partially, i.e to an extent described by the loss given default (LDG).

For this scenario, assume the following:

- Loss given default (LGD) = 50%
- Downgrading: By three notches (e.g. from A+ to BBB+)
- Cost of new reinsurance: Double
- Catastrophe causing the reinsurers to be downgraded: A large natural catastrophe followed by a downturn of the global financial market comparable to 2001/2002. For the natural catastrophe, an assumption has to be chosen which also affects the balance sheet of the insurance company.

3) Pandemic Scenario

Companies have to evaluate the impact of a global severe pandemic on their economic balance sheet. A global pandemic is assumed to have not only impact on mortality/morbidity but also on the global financial market.

In the following FOPI gives guidance on which risk factors should be considered. This guidance also encompasses quantitative benchmark figures which FOPI expects companies to use for guidance. If a company has however a better model and more sophisticated assumptions, these can be acceptable if documented appropriately and argued for convincingly.

The quantitative figures are based on the following studies:

- [1] The Economics of Pandemic Influenza in Switzerland, James Piercy and Adrian Miles, Swiss Federal Office of Public Health, March 2003
- [2] Avian Flu, Science, Scenarios and Stock Ideas, Citigroup, Global Portfolio Strategist, 9 March 2006
- [3] Global Macroeconomic Consequences of Pandemic Influenza, Warwick J. McKibbin and Alexandra A. Sidorenko, Lowy Institute for International Policy, Sydney, February 2006

The FOPI pandemic scenario corresponds globally to the 'severe scenario' in [3] and for Switzerland to the scenario in [1].

Biometric Effects of a Pandemic

Mortality:

For extra mortality use table 1 in [3] for the different regions. Extra mortality corresponds roughly to a doubling for Europe, an increase by approx. 60% for North America and by up to 1000% for Asia.

USA	0.35	Singapore	1.73
Japan	0.84	Thailand	1.32
UK	0.64	China	1.11
Europe	0.50	India	1.16
Canada	0.49	Taiwan	1.24
Australia	0.54	Korea	1.23
New Zealand	0.65	Hong Kong	1.21
Indonesia	2.70	LDC	1.08
Malaysia	2.24	EEFSU	0.66
Philippines	2.60	OPEC	1.77
		Total	1.10

EEFSU: Eastern Europe and the Former Soviet Union

LDC: Least Developed Countries

OPEC: Organization of the Petroleum Exporting Countries

(Deaths in each region in 2006 (% population number) for a severe pandemic, from [3])
As in the 1918/19 pandemic, we assume that adults are relatively more likely to die than the elderly. Therefore we assume that mortality changes according to a mixed multiplicative law, i.e. that $q_x^{\text{pandemic}} = \alpha * q_x + \beta$. The parameters alpha and beta have to be chosen such

that the extra mortality corresponds to the data in the table above and such that 1/3 of the extra deaths are persons younger than 65.

Hospitalization, Bed Days:

For hospitalization cost, use table 20, 22 and 24 (summation) in [1] for Switzerland and project proportional to number of inhabitants and number of projected death for different countries. For instance for the UK, this would imply a multiplicative factor of

$$60\text{Mio} / 7\text{Mio} \times 0.64 / 0.50 = 11$$

for bed days, hospitalizations, GP visits, etc. This example assumed a population of 60Mio for the UK and 7 Mio for Switzerland. The extra mortality for the UK and Switzerland is taken from the table above.

For direct and indirect cost, use country specific assumptions.

	Children (0-14)	Adults (15-49)	Adults (50-64)	Elderly (65+)	Adults (15-64) :	Eldrely (65+)	HCW
Susceptible Population	2429305	6666515	2694816	1852550	881398	868052	597449
Cases of Illness	1001136	2242890	485603	228701	226314	107163	173252
GP visits	508549	968972	210059	123902	128886	66497	78093
Hospitalisations	2928	13287	1884	2824	8317	2560	1411
Bed Days	20555	43592	6404	25641	76694	58961	8857
Deaths	4831	10295	3523	3072	4995	14190	1096
Discounted Life Years Lost	99518	198694	55311	27340	86912	127710	19070
Work days lost	N/A	8519486	1842142	N/A	921977	N/A	849512
Direct costs	55533494	167838052	30279409	33147183	75985750	26190667	16392063
Indirect costs	N/A	1359037335	293860125	N/A	147074625	N/A	135514943
Total cost	55533494	1526875387	324139534	33147183	223060375	26190667	151907006

(data from [1], sum of tables 20, 22 and 24)

Financial Market Effects:

We assume that global financial markets will be affected strongly by a severe pandemic in such a way that interest rates will fall, spreads will widen, most currencies will depreciate against the Swiss Franc and equity prices will drop depending on the sector. We follow in the assumptions closely [2] and [3].

FX rates

We assume that some FX rates will depreciate against the CHF.

USD:	- 0%
EUR:	- 0%
UK:	- 0%
Japan:	-10%
Other Asian currencies:	-35%
All other Emerging Market Currencies:	-25%

Interest rates

For changes in bond rates, we follow the assumptions in [3]. For the Swiss and Japanese bonds, it can be assumed that bond rates have a floor of 0 and that changes in bond rates are flat for $t > 10$. All changes are in basis points (bp).

Years	CHF	EUR	UK	USA	Japan
short	-37.0	-37.0	-83.0	-50.0	-38.0
1	-34.0	-34.0	-76.1	-45.8	-35.2
2	-31.0	-31.0	-69.2	-41.6	-32.4
3	-28.0	-28.0	-62.3	-37.4	-29.6
4	-25.0	-25.0	-55.4	-33.2	-26.8
5	-22.0	-22.0	-48.5	-29.0	-24.0
6	-19.0	-19.0	-41.6	-24.8	-21.2
7	-16.0	-16.0	-34.7	-20.6	-18.4
8	-13.0	-13.0	-27.8	-16.4	-15.6
9	-10.0	-10.0	-20.9	-12.2	-12.8
10	-7.0	-7.0	-14.0	-8.0	-10.0
>10	-7.0	-7.0	-14.0	-8.0	-10.0

(Data based on tables 9 and 10 from [3])

Spread changes

We assume a general spread widening for all rating classes.

AAA	+75 bp
AA	+100 bp
A	+150 bp
BBB	+200 bp
Junk	+400 bp

Equity Prices:

We assume equity prices to change strongly dependent on the sector. In the argumentation we follow [2].

Losers:

Transport:	-50%
Tourism:	-50%
Luxury Goods:	-25%
Construction:	-25%
Resources/Materials:	-25%
Oil and Gas:	-25%
Banks:	-25%
Insurance and Reinsurance:	-25%
Food:	-25%

Winners:

Pharmaceutical:	+25%
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Neutral:

Consumer (non discretionary)	0%
Utilities:	0%
Telecoms and Media:	+0%