

EAAC 15.10 -18.10.2013  
**Mitigating the Volatility of the Health Portfolio**

Singapore, 18.10.2013  
Herbert Meister



## Agenda



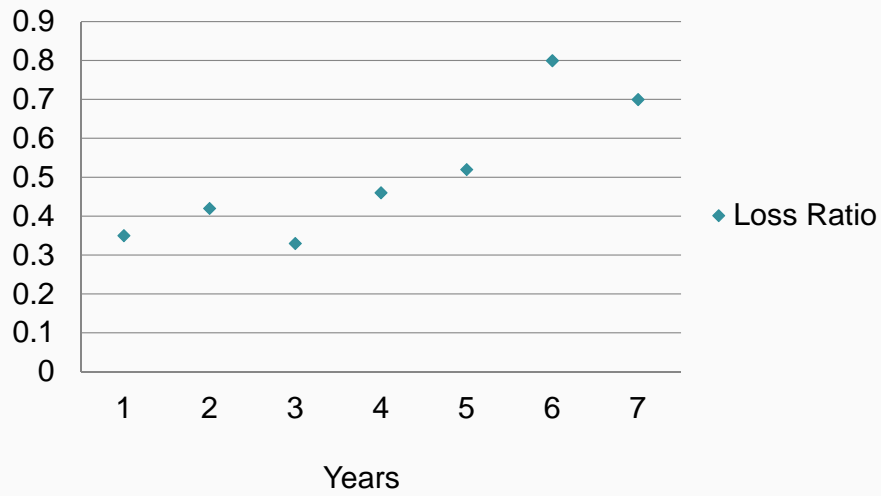
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1. Introduction
  2. Reasons for Claims Volatility
  3. Challenges and Mitigations



# Introduction



## Claims Experience

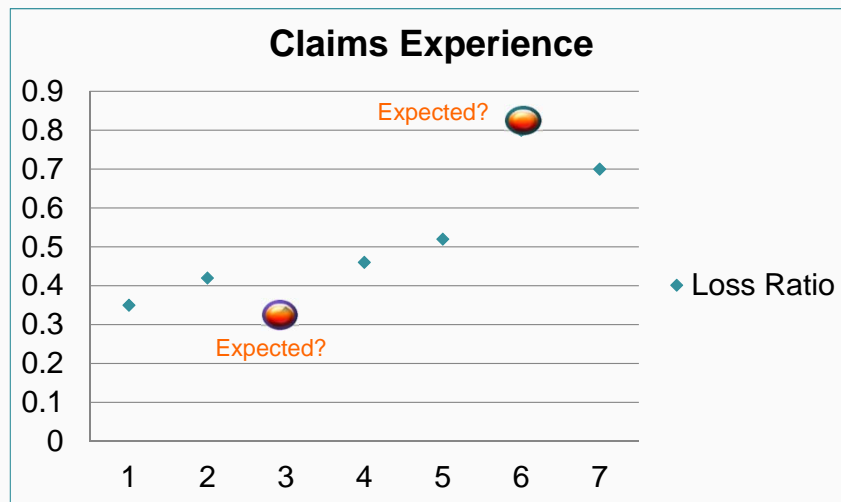


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# Introduction



## Claims Experience

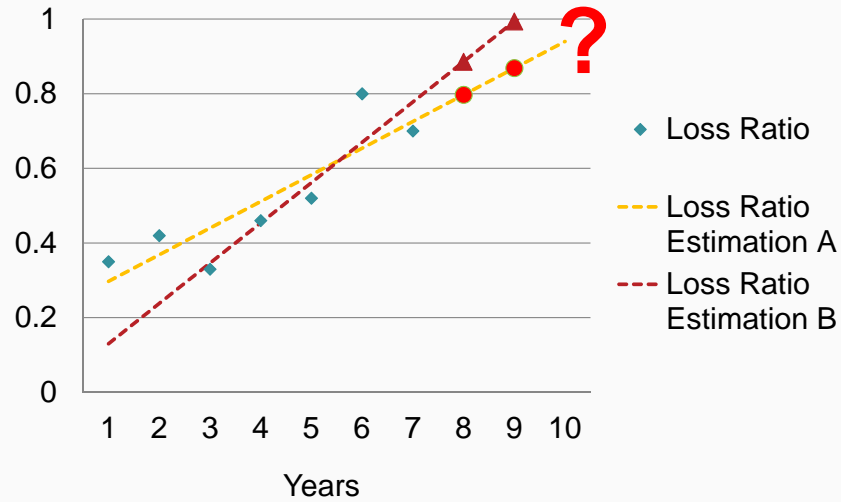


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# Introduction



## Performance Forecast



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# Agenda



- 1. Introduction
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# Reasons for Claims Volatility



## Healthcare Reforms



# Reasons for Claims Volatility



## Healthcare Reforms

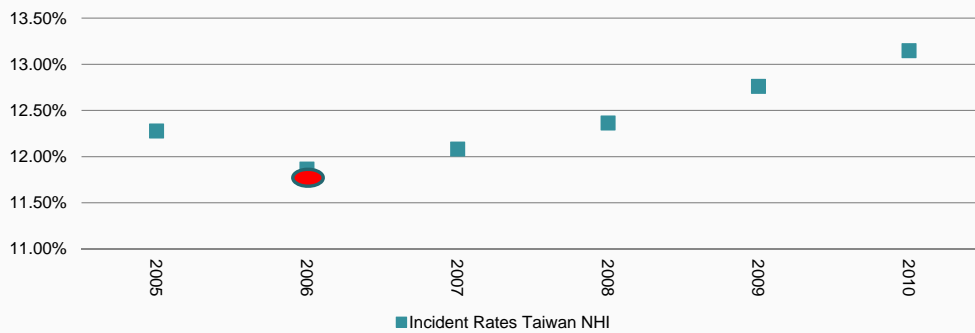
Reform Types	Potential Impact
<ul style="list-style-type: none"> <li>Reforms related to Medical Provider</li> </ul>	<ul style="list-style-type: none"> <li>- Change of provider billing behavior</li> <li>- Change of provider utilization behavior</li> <li>- Change of insured's utilization behavior</li> </ul>
<ul style="list-style-type: none"> <li>Reforms related insurance products and underwriting (minimum benefits, waiver of exclusions, waiver of limits pricing standards, underwriting rules.....)</li> </ul>	
<ul style="list-style-type: none"> <li>Reforms related to the social health insurance system (eligibility, changes in benefits, screening programs,..)</li> </ul>	
<ul style="list-style-type: none"> <li>Reforms to growth population (tax incentives for families, baby bonus....)</li> </ul>	



## Reasons for Claims Volatility

### Healthcare Reforms change consumer or provider behavior

Taiwan Inpatient Incident Rates



## Reasons for Claims Volatility

### Epidemics/Pandemics



**1918**  
„Spanish flu“  
A (H1N1)  
-Avian Flu-

Ca. 20-40m deaths  
Incident rates hospitalisation: 2.6%



**1957**  
„Asian flu“  
A (H2N2)

Ca. 1.5m deaths

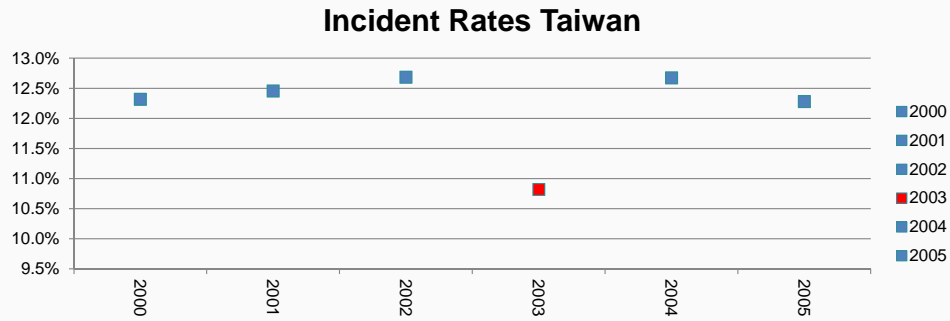


**1968**  
„Hong Kong flu“  
A (H3N2)

Ca. 0.75-1m deaths

## Reasons for Claims Volatility

Epidemics/Pandemics change consumer or provider behavior



Potential SARS Pandemic effect 2003 in Taiwan

## Reasons for Claims Volatility

### New or Revised Products

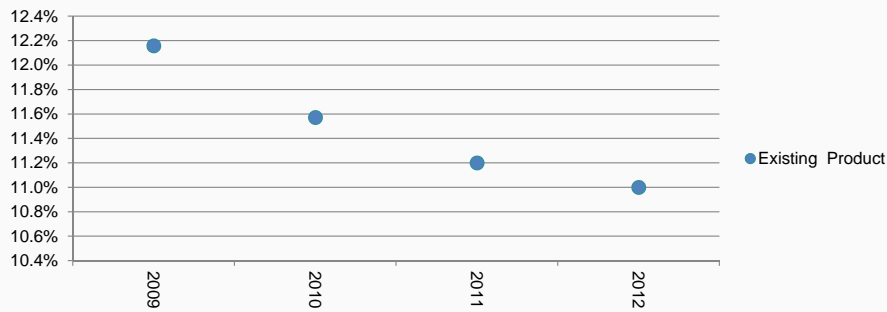


## Reasons for Claims Volatility



New or Revised Products change consumer or provider behavior

Incident Rates Inpatient Product, Hongkong



Considerable and unusual decrease of incident rates. Why?



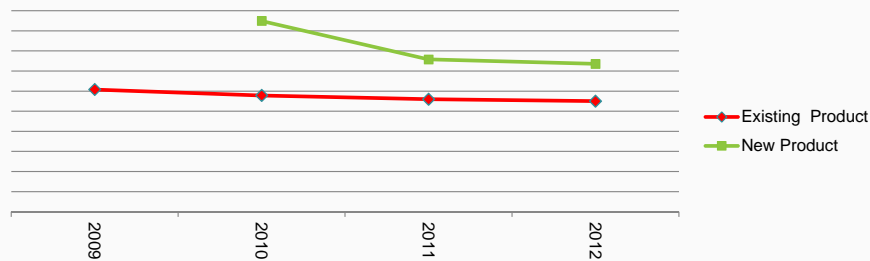
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## Reasons for Claims Volatility



New or Revised Products change consumer or provider behavior

Incident Rates Inpatient (existing and newly launched) Product



Launch of new product at the end of 2010 lead to anti-selective behavior of existing insured's against the new product



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## Reasons for Claims Volatility



### Product enhancements lead to higher expected volatility

- Extended geographical coverage (regional coverage, worldwide coverage)
- Increased annual limits and sub-limits
- Addition of benefits (claim free bonus, premium waiver,...)
- Waiver of exclusions (for instance congenital diseases, HIV,..)



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## Reasons for Claims Volatility



### Some Product restrictions can lead to higher expected volatility

- Introduction of high deductibles
- Introduction of long(er) waiting periods/deferment periods



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## Reasons for Claims Volatility



### Sample Model

Indian Inpatient Product with currently sum insured of Rs 300,000 shall be increased to Rs 500,000

- Portfolio of 20,000 Insured's
- Incident Rates 5%, e.g. 1000 claims are expected
- We assume Incident rates follow Poisson Distribution with fitted claim size distribution: LogNormal assuming average bill size of Rs 30,000 and standard deviation of Rs 60,000
- We assume one cat event every 200 years



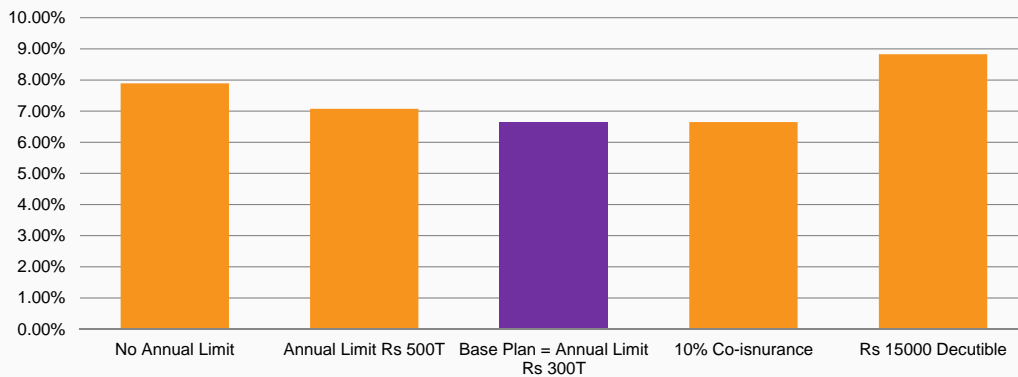
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## Reasons for Claims Volatility



### Impact of certain product features

Standard Deviation of Result



Based on 50T iterations



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## Reasons for Claims Volatility



### Outlier Claims



## Reasons for Claims Volatility



### Outlier Claims

Male, birth year 1989, Diagnosis: Hemophilia A , Germany

Year	Inpatient Costs	Outpatient Costs	Dental Costs	Total Costs (Euro)
2000	43,688	1,287,687	1,211	1,332,585
2001	0	2,250,997	1,244	2,252,241
2002	0	2,033,927	1,409	2,035,336
2003	2,118	1,282,623	646	1,285,387
2004	425	2,676,934	735	2,678,094
2005	45,251	3,749,643	65	3,794,959
2006	0	4,550,399	0	4,550,399
2007	825	4,264,226	122	4,265,173
2008	0	3,695,989	0	3,695,989
2009	0	2,934,736	69	2,934,805
Total	92,307	28,727,161	5,501	28,824,968

-Hemophilia is a chronic and expensive condition  
 - Pharmaceutical products accounted for greater than 90% of total medical costs.



# Agenda

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- 3. Challenges and Mitigations

# Challenges and Mitigations



# Challenges and Mitigations

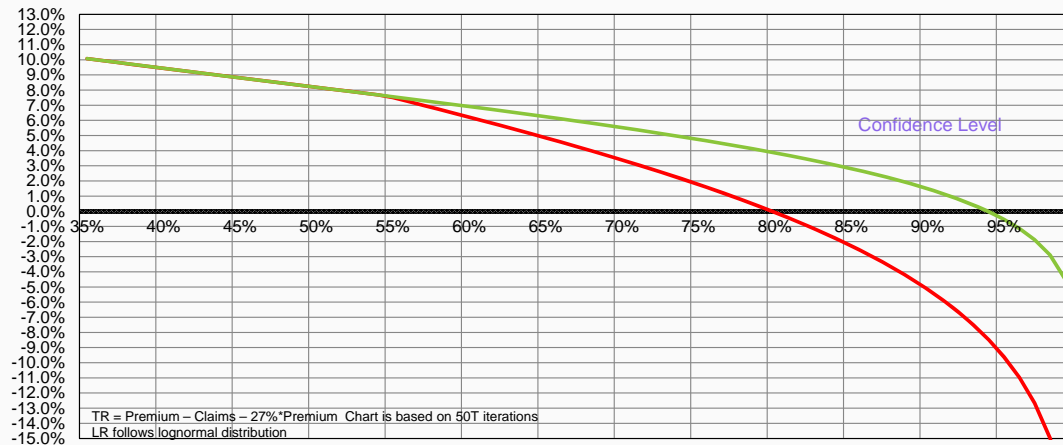


## Example 1: Increase of SI no change of Premium

Best Estimate LR = 65%, Expenses&Commission=27%

TR in % of Premium

### Distribution of Technical Results



— Technical Result after increase of SI — Technical Result Base Plan



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# Challenges and Mitigations

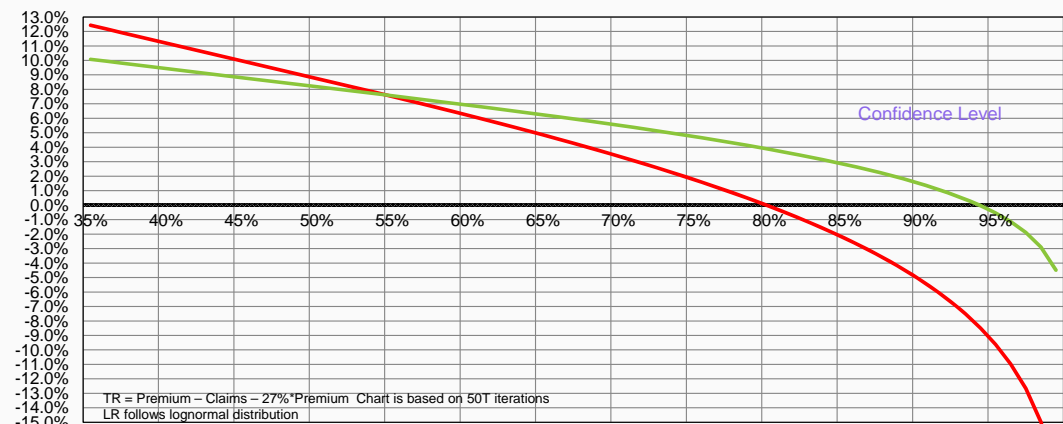


## Example 2: Increase of SI and increase of Premium

Best Estimate LR = 65%, Expenses&Commission=27%

TR in % of Premium

### Distribution of Technical Results



— Technical Result High SI — Technical Result Low SI



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## Challenges and Mitigations



1. Have a stochastic pricing model in place – allowing you to conclude on technical result distribution.

Model should ideally cover

- Assumptions related to future trends in incident rates and claim size
- Assumptions related to the distribution of the loss ratio or the distribution incident rates and claim size
- Assumptions related to potential cat events: Epidemic, Pandemic, Terror, Nat Cat, Large Claims.....

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## Challenges and Mitigations



2. Use the stochastic model at least annually, to
  - a. calculate the expected technical result distribution of existing portfolios and define targets, for instance TR after commission  $>0$  with confidence level 90%.
  - b. evaluate the impact on the result distribution of new products/ product features or regulatory changes and optimize product features accordingly, e.g. (deductibles, annual limits and sub-limits, case limits, premium changes, claim free bonuses, exclusions, etc. )

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# Challenges and Mitigations



- 3. Look for additional mitigations in case
  - a. the result distribution does not match the target, or
  - b. in case of additional uncertainties due to potential healthcare reforms, such as
    - Reinsurance, protecting the portfolio a) against high claims only or b) against high claims and higher than expected incident rates
    - Additional Claims Fluctuation Reserve - if permitted by regulations



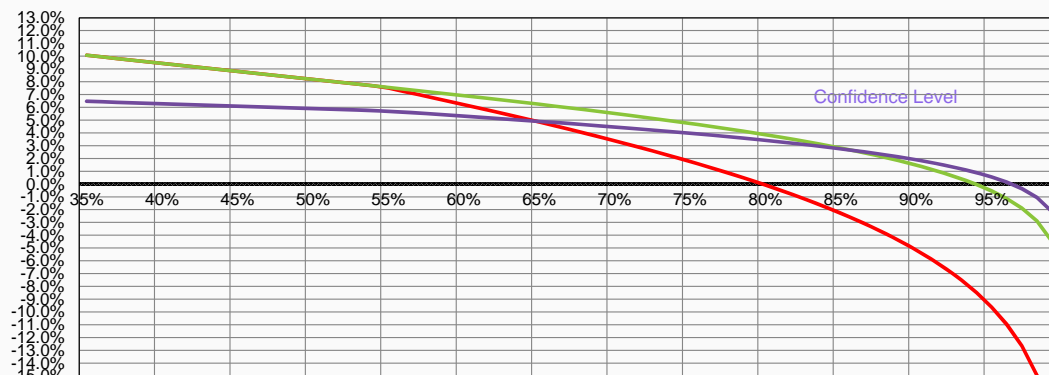
# Challenges and Mitigations



## Example 1

### Distribution of Technical Results with and w/o Aggregate Stop Loss (30% Coinsurance)

TR in % of Premium



- Technical Result after increase of SI
- Technical Result Base Plan
- Technical Result after increase of SI after Reinsurance



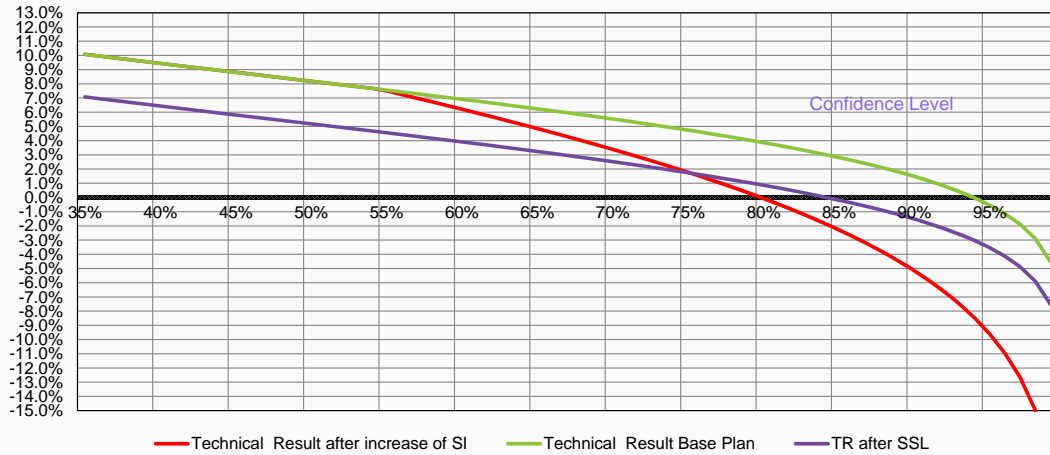
# Challenges and Mitigations



Example 2

TR in % of Premium

## Distribution of Technical Results after RXOL



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THANK YOU VERY MUCH  
FOR YOUR ATTENTION



Herbert Meister  
Chief Actuary, APAC - Munich Health  
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